Research Methods in Psychology

DPSY512

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LOVELY PROFESSIONAL UNIVERSITY

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CONTENT

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Unit 01: Philosophical Roots of Psychological Research

Contents

Objectives

After completion of this unit, the students will be able to:

- understand the meaning of Psychological Research
- know different components of Psychological Research
- familiarize with the applications of Psychological Research

Introduction

Research is a careful investigation or inquiry especially through search for new facts in any branch of knowledge. (The advance learner's dictionary of current English) Research is a systematic, formal,

rigorous and precise process employed to gain solutions to problems or to discover and interpret new facts and relationships (Waltz & Bussell, 1981).

Research is the systematic, controlled, empirical and critical investigation of hypothetical propositions about the presumed relations among natural phenomena (Kerlinger, 1973).

Research is the pursuit of truth through objective and systematic method of finding solutions to a problem (Kothari, 2004). (Niangua, 2013)

Scientific researches are studies that should be systematically planned before performing them. In this review, classification and description of scientific studies, planning stage randomization and bias are explained.

Social science research is focused on finding reasons for human behavior. Social science research is conducted using the scientific method: ask a question, form a hypothesis, conduct empirical research, draw a conclusion, and evaluate the conclusion.

Social Research is a method used by social scientists and researchers to learn about people and societies so that they can design products/services that cater to various needs of the people. Different socio-economic groups belonging to different parts of a county think differently. Various aspects of human behavior need to be addressed to understand their thoughts and feedback about the social world, which can be done using Social Research. Any topic can trigger social research – new feature, new market trend or an upgrade in old technology.

Social Research is conducted by following a systematic plan of action which includes qualitative and quantitative observation methods.

Qualitative methods rely on direct communication with members of a market, observation, text analysis. The results of this method are focused more on being accurate rather than generalizing to the entire population.

Quantitative methods use statistical analysis techniques to evaluate data collected via surveys, polls or questionnaires.

Social Research contains elements of both these methods to analyze a range of social occurrences such as an investigation of historical sites, census of the country, detailed analysis of research conducted to understand reasons for increased reports of molestation in the country etc.

A survey to monitor happiness in a respondent population is one of the most widely used applications of social research. The happiness survey template can be used by researchers an organization to gauge how happy a respondent is and the things that can be done to increase happiness in that respondent.

1.1Objectives of Psychological Research

Objectives of Psychological Research The aim of psychological research, like research in natural sciences, is to discover new facts or verify and test old social facts. It tries to understand human behavior and its interactionwith the environment and social institutions. It tries to find out the causal connection

between human activities and natural laws governing them. It also aims to develop newscientific tools, concepts and theories, which would facilitate the reliable and valid studyof human behavior and social life.Social research follows the norms and tools of natural science, which emphasizes validity, reliability and verifiability of the phenomenon studied. The scientific rigor insocial science research implies objectivity, neutrality and empirically producedevidence. Empiricism comprises of the observation, collection, analysis andinterpretation of data.

1.2 Need for Psychological Research

1. Social scientists help us imagine alternative futures.

Social science can open up debate and give us a say in shaping our collective future. The social sciences developed as a field of study during the nineteenth century. Social science helped people understand the consequences and application of the new technologies of the age, such as steam power.

The growth of railways and factories not only transformed the economy and the world of work, but also changed forever the way people organized their family lives and leisure. Today nanotechnology and advances in medical research will have a significant impact on the way we live.

They present us with a bewildering range of ethical, legal and social issues. But it isn't enough to rely on the scientists. We also need social scientists to analyses and critique what's going on. That way we will make informed choices that shape the future.

The Probationary Imperative: For more ideas on this topic Steve Fuller's books are a good place to start.

2. Social science can help us make sense of our finances.

Social science is not just important for the future but for what's happening now. We all resent paying to withdraw our money from cash machines. Charges can amount to £120 per year. Social scientists working on behalf of the Runnymede Trust found that this doesn't just this depend on where we live, but that black and minority ethnic people are more likely to live in areas where they're forced to pay.

This put pressure on banks to ensure we all have access to machines that don't charge. A range of social scientists – not just economists but also psychologists, sociologists and political scientists, for example - can help us understand the economic crisis and weigh up decisions we make for ourselves and those which governments make on our behalf. Without this kind of analysis, we may feel like pawns in a global game of chess.

With the knowledge and understanding that social science offers us, we will feel empowered to act for ourselves, and to influence decisions being made on our behalf.

Unequal Ageing in Europe: explores the gender pension gap across the 28 member states of the European Union, plus Iceland and Norway

3. Social scientists contribute to our health and well- being.

From sports sociologists to public health experts, from those interpreting medical statistics to those evaluating policies for our care in old age, social scientists are working hard to make sure that our health, leisure and social care services work to best effect.

Social geographers at the University of Sheffield, for example, have shown that those of us who don't follow eating advice are not simply weak- willed or ignorant. Our eating habits are influenced by a whole range of circumstances. Some apparently unhealthy choices may seem rational: if the person doing the shopping knows that others will simply not eat the healthy option and it will just go to waste, they may simply not buy it.

So, it's no good just giving people a booklet on healthy eating. Effective nutritional advice needs to be tailored to people's everyday lives and contexts.

Long-Term Care in Europe: analyzes the key issues at stake in developing long-term care systems for older people in Europe.

4. Social science might save your life.

Psychologists at the University of Liverpool spent time in a steel factory to work out what needs doing to create a safer environment. Accidents at work happen even in the best regulated companies that provide staff training and take all necessary precautions.

A top- down imposed safety regime simply doesn't work. It's when people see unsafe work practices as unacceptable and take decisions as teams that workplaces become safer. Employers need to see people as individuals who take their lead from those with whom they identify. These principles have also been shown to work in crowd control.

When those responsible for crowd management at football matches are trained in techniques which take this into account, there's virtually no trouble.

Adjudicating Employment: Rights compares and analyses institutions for resolving employment rights disputes in ten countries.

5. Social science can make your neighborhood safer.

One common myth is that if you take measures to reduce crime in one neighborhood the criminals simply move on, leading to increased crime in another area. Sociologists at Nottingham Trent University worked closely with police to reduce crime through a method involving scanning for crime patterns.

They were able to identify patterns that regular police work had not picked up, so avoiding guess work and lost time. A technique called situational crime prevention developed by the same team is now regularly used by the police, working with the public and private sectors to prevent crime. Together they make things more difficult for would- be criminals.

For example, in one area there was a serious problem of lead being stolen from community building roofs. By working with dealers in the scrap metal market, and persuading them to keep records, it then became too risky to buy what might be stolen lead.

The Handbook of Security, 2nd edition: is the most comprehensive analysis of scholarly security debates and issues to date.

6. We need social scientists as public intellectuals.

British society is sometimes said to be anti- intellectual. Yet in our fast-changing world, there is a place for the social scientist as public intellectual. This doesn't have to be a succession of boring grey talking heads, such as you can find on French TV any night. That's enough to cause anyone to start channel surfing. Social scientists have a duty to make their work interesting and engaging to the rest of us.

They need to explain not only why social science is relevant but do it in a compelling way. Then we will want to listen, read and find out more. Perhaps more social scientists will have to become active listeners, talking more often to the public, each other and to scientists.

Then we can get all the disciplines around the table together. In a knowledge- based world, we need people who can integrate a variety of different types of knowledge, and that come from different intellectual roots and from a range of institutions to work together.

The Price of Public Intellectuals: is an historically-informed survey critically outlining sociological, psychological, political, and economic approaches to the role of public intellectuals.

7. Social science can improve our children's lives and education.

All societies and all governments want to show they are dong the best for children. Yet too often education reform seems to take place without regard for the best interests of the learners. Education research shows that many parents, particularly parents of younger children, are more concerned that their children enjoy school, than that they are academic stars.

By working with students of all ages to understand their perspectives on schooling, researchers at the universities of Cambridge and Leeds have discovered new insights into what makes effective schools, and what makes for effective school leadership.

We just need to listen to children, provide structured opportunities for them to give their views, and prepare adults to really listen. Today even OFSTED, the school inspection service, has to listen to children's viewpoints.

Informal Education, Childhood and Youth: emphasizes how geography – space and place – matter to informal education practices, through a range of examples.

8. Social science can change the world for the better.

We can generally agree that world needs to be a safer place where all people can enjoy basic dignity and human rights. This is the case even when we can't always agree on what we should do to make this happen. Social scientists working in interdisciplinary teams have made their mark in the area of human welfare and development.

They are concerned with the social and economic advancement of humanity at large. They work with government institutions, UN organizations, social services, funding agencies, and with the media.

They are influencing the work of strategists, planners, teachers and program me officers in developing and growing economies, like India, to influence development so that it impacts on the lives of the poorest members of society. For example, social scientists from the Delhi School of Economics are cooperating with colleagues at SOAS, University of London to explore the impact of legislation in India to guarantee minimum wages for rural unskilled manual labourers on the loves of women.

They found the new law provided opportunities for some women to become wage earners where none had existed before, reducing the risk of hunger and the chances of avoiding hazardous work. But they also identified barriers to women benefitting from the changes, including harassment at the worksite.

Those working in development studies are then able to support women's ability to benefit by looking for creative solutions to such problems.

Why the Social Sciences Matter: provides an illuminating look at topics of concern to everyone at the beginning of the twenty-first century.

9. Social science can broaden your horizons.

For debates about feminism, peace, ecology, social movements, and much more, social science offers each of us new perspectives and new ways of understanding. Whether your idea of relaxation is visiting a museum, watching soaps, or chatting online, social science encourages a fresh look at our everyday activities and culture.

Social scientists at the University of Leicester are making an impact on museums across the world, with the goal of making them more inclusive, abler to challenge prejudices, inspire learning and be more relevant in contemporary society.

One example is their work with the Gallery of Modern Art in Glasgow to involve local communities and international visitors alike in engaging with exhibitions on a range of social justice issues from sectarianism to gay rights, through programs including arts workshops and residencies.

Radical Feminism: is a radical and pioneering feminist manifesto for today's modern audience written by one of the cornerstones of today's feminist scene.

10. We need social science to guarantee our democracy.

Social science offers multiple perspectives on society, informs social policy and supports us in holding our politicians and our media to account.

The Centre for the Study of Global Media and Democracy at Goldsmith's College, London is monitoring how transformation from traditional to digital media is examining the move away from traditional journalism and politics to where we as citizens try to be community journalists, presenting our own accounts on- line. The work brings together specialists in media and communications, sociology and politics.

Individual citizens may feel empowered by this but there are risks in turning away from traditional journalism, including fewer opportunities for in- depth analysis and critique of powerful interests. This work by social scientists is critical in protecting a modern and transparent democracy. Just think what might happen without it!

1.3 Purpose of Research

From weather forecasts to the discovery of antibiotics, researchers are constantly trying to find new ways to understand the world and how things work – with the ultimate goal of improving our lives.

The purpose of research is therefore to find out what is known, what is not and what we can develop further. In this way, scientists can develop new theories, ideas and products that shape our society and our everyday lives.

The purpose of research is to further understand the world and to learn how this knowledge can be applied to better everyday life. It is an integral part of problem solving.

Although research can take many forms, there are three main purposes of research:

Exploratory: Exploratory research is the first research to be conducted around a problem that has not yet been clearly defined. Exploration research therefore aims to gain a better understanding of the exact nature of the problem and not to provide a conclusive answer to the problem itself. This enables us to conduct more in-depth research later on.

Descriptive: Descriptive research expands knowledge of a research problem or phenomenon by describing it according to its characteristics and population. Descriptive research focuses on the 'how' and 'what', but not on the 'why'.

Explanatory: Explanatory research, also referred to as casual research, is conducted to determine how variables interact, i.e., to identify cause-and-effect relationships. Explanatory research deals with the 'why' of research questions and is therefore often based on experiments.

1.4 Characteristics of Psychological Research

- Good research follows a systematic approach to capture accurate data. Researchers need to practice ethics and a code of conduct while making observations or drawing conclusions.
- The analysis is based on logical reasoning and involves both inductive and deductive methods.
- Real-time data and knowledge are derived from actual observations in natural settings.
- There is an in-depth analysis of all data collected so that there are no anomalies associated with it.
- Good research follows a systematic approach to capture accurate data. Researchers need to practice ethics and a code of conduct while making observations or drawing conclusions.
- The analysis is based on logical reasoning and involves both inductive and deductive methods.
- Real-time data and knowledge is derived from actual observations in natural settings.
- There is an in-depth analysis of all data collected so that there are no anomalies associated with it.
- It creates a path for generating new questions. Existing data helps create more research opportunities.

There are 8 core characteristics that all research projects should have. These are:

Empirical – based on proven scientific methods derived from real-life observations and experiments.

Logical – follows sequential procedures based on valid principles.

Cyclic – research begins with a question and ends with a question, i.e. research should lead to a new line of questioning.

Controlled – vigorous measures put into place to keep all variables constant, except those under investigation.

Hypothesis-based – the research design generates data that sufficiently meets the research objectives and can prove or disprove the hypothesis. It makes the research study repeatable and gives credibility to the results.

Analytical – data is generated, recorded and analyzed using proven techniques to ensure high accuracy and repeatability while minimizing potential errors and anomalies.

Objective – sound judgement is used by the researcher to ensure that the research findings are valid.

Statistical treatment – statistical treatment is used to transform the available data into something more meaningful from which knowledge can be gained.

1.5 What is the Research Process?

The Research Process is a process of multiple scientific steps in conducting the research work. Each step is interlinked with other steps. The process starts with the research problem at first. Then it advances in the next steps sequentially.

Generally, a researcher conducts research work within seven steps. In research work, primarily, you require a Research Proposal. It is because the proposal approves the research project whether you achieve the ability to conduct research or not. So when you write a research proposal, present the detailed plans and specific objectives of your research correctly.

Stages in the Research Process

These 8 stages in the Research Process are;

1. Identifying the problem.
2. Reviewing literature.
3. Setting research questions, objectives, and hypotheses.
4. Choosing the study design.
5. Deciding on the sample design.
6. Collecting data.
7. Processing and analyzing data.
8. Writing the report.

Dissertation markers expect the explanation of research process to be included in Methodology chapter. A typical research process comprises the following stages:

1. ***Selecting the research area.*** You are expected to state that you have selected the research area due to professional and personal interests in the area and this statement must be true. The importance of this first stage in the research process is often underestimated by many students. If you find research area and research problem that is genuinely interesting to you it is for sure that the whole process of writing your dissertation will be much easier. Therefore, it is never too early to start thinking about the research area for your dissertation.

2. ***Formulating research aim, objectives and research questions or developing hypotheses***. The choice between the formulation of research questions and the development of hypotheses depends on your research approach as it is discussed further below in more details. Appropriate research aims and objectives or hypotheses usually result from several attempts and revisions and these need to be mentioned in Methodology chapter. It is critically important to get your research questions or hypotheses confirmed by your supervisor before moving forward with the work.

3. ***Conducting the literature review.*** Literature review is usually the longest stage in the research process. Actually, the literature review starts even before the formulation of research aims and objective; because you have to check if exactly the same research problem has been addressed before. Nevertheless, the main part of the literature review is conducted after the formulation of research aim and objectives. You have to use a wide range of secondary data sources such as books, newspapers, magazines, journals, online articles etc.

4. ***Selecting methods of data collection.*** Data collection method(s) need to be selected on the basis of critically analyzing advantages and disadvantages associated with several alternative data collection methods. In studies involving primary data collection, in-depth discussions of advantages and disadvantages of selected primary data collection method(s) need to be included in methodology.

5. ***Collecting the primary data.*** Primary data collection needs to be preceded by a great level of preparation and pilot data collection may be required in case of questionnaires. Primary data collection is not a compulsory stage for all dissertations and you will skip this stage if you are conducting desk-based research.

6. ***Data analysis.*** Analysis of data plays an important role in the achievement of research aim and objectives. Data analysis methods vary between secondary and primary studies, as well as, between qualitative and quantitative studies.

7. ***Reaching conclusions.*** Conclusions relate to the level of achievement of research aims and objectives. In this final part of your dissertation, you will have to justify why you think that research aims and objectives have been achieved. Conclusions also need to cover research limitations and suggestions for future research.

1.6 Ethical Issues in Psychological Research

Research involving human subjects must follow certain ethical standards to make sure the subjects are not harmed. Such harm can be quite severe in medical research unless certain precautions are taken. For example, in 1932 the U.S. Public Health Service began studying several hundred poor,

illiterate African American men in Tuskegee, Alabama. The men had syphilis, for which no cure then existed, and were studied to determine its effects. After scientists found a decade later that penicillin could cure this disease, the government scientists decided not to give penicillin to the Tuskegee men because doing so would end their research. As a result, several of the men died from their disease, and some of their wives and children came down with it. The study did not end until the early 1970s, when the press finally disclosed the experiment. Several observers likened it to experiments conducted by Nazi scientists. If the subjects had been white and middle class, they said, the government would have ended the study once it learned that penicillin could cure syphilis (Jones, 1Fortunately, sociological research does not have this potential for causing death or serious illness, but it still can cause other kinds of harm and thus must follow ethical standards. The federal government has an extensive set of standards for research on human subjects, and the major sociology professional society, the American Sociological Association, has a code of ethics for psychological research.

One of the most important ethical guidelines in sociological and other human-subject research concerns privacy and confidentiality. When they do research, sociologists should protect the privacy and confidentiality of their subjects. When a survey is used, the data must be coded (prepared for computer analysis) anonymously, and in no way should it be possible for any answers to be connected with the respondent who gave them. In field research, anonymity must also be maintained, and aliases (fake names) should normally be used when the researcher reports what she or he has been observing.

Some psychologists consider the privacy and confidentiality of subjects so important that they have risked imprisonment when they have refused to violate confidentiality. In one example, a graduate student named Mario Brajuha had been doing participant observation as a restaurant waiter on Long Island, New York, when the restaurant burned down. When the police suspected arson, they asked Brajuha to turn over his field notes. When Brajuha refused, he was threatened with imprisonment. Meanwhile, two suspects in the case also demanded his field notes for their legal defense, but again Brajuha refused. The controversy ended 2 years later when the suspects died and the prosecutor's office abandoned its effort to obtain the notes (Brajuha & Hallowell, 1986).

In another case, a graduate student named Rik Scarce refused to turn over his field notes on radical environmentalists after one of the groups he was studying vandalized a university laboratory. Scarce was jailed for contempt of court when he refused to tell a grand jury what he had learned about the group and spent several months behind bars (Monaghan, 1993).

A third example aroused much discussion among sociologists when it came to light. Laud Humphreys studied male homosexual sex that took place in public bathrooms. He did so by acting as the lookout in several encounters where two men had sex; the men did not know Humphreys was a researcher. He also wrote down their license plates and obtained their addresses and a year later disguised himself and interviewed the men at their homes. Many sociologists and other observers later criticized Humphreys for acting so secretly and for violating his subjects' privacy. Humphreys responded that he protected the men's names and that their behavior was not private, as it was conducted in a public setting (Humphreys, 1975).981).

Another ethical issue concerns consent. Before a researcher can begin obtaining data, the subjects of the research must normally sign an informed consent form. This form summarizes the aims of the study and the possible risks of being a subject. If researchers want to study minors (under age 18), they normally must obtain a signature from a parent or legal guardian. Informed consent is a requirement for most "real" research these days, but ethical issues arise over the meaning of "consent." For consent to have any real meaning, potential research subjects must have the right to refuse to take part in a research project without any penalties whatsoever. Otherwise, they may feel pressured to participate in the project without really wanting to do so. This result would violate what "consent" is supposed to mean in the research process. Sometimes subjects are promised a small reward (often between $5 and $20) for taking part in a research project, but they are still utterly free to refuse to do so, and this small inducement is not considered to be undue pressure to participate.

Informed consent becomes a particular problem when a researcher wants to include certain populations in a study. Perhaps the clearest example of such a problem is when a study involves prisoners. When prisoners are asked to be interviewed or to fill out a questionnaire, they certainly can refuse to do so, but they may feel pressured to participate. They realize that if they do participate, they may be more likely to be seen as a "model" prisoner, which helps them win "good time" that reduces their sentence or helps them win a release decision from a parole board. Conversely, if they refuse to participate, they not only lose these advantages but also may be seen

as a bit of a troublemaker and earn extra scrutiny from prison guards. Scholarly societies continue to debate the ethical issues involved in studies of prisoners and other vulnerable populations (e.g., offenders in juvenile institutions, patients in mental institutions), and there are no easy answers to the ethical questions arising in such studies.

As all these examples of ethical issues demonstrate, it is not always easy to decide whether a particular research project is ethically justifiable. Partly for this reason, colleges and universities have committees that review proposed human-subject research to ensure that federal guidelines are followed.

1.7 Positivism

Positivism is a philosophy in which people believe the goal of knowledge is only to describe what people experience, and that science should only study that which is measurable. Anything that is not measurable or experienced is irrelevant. They also believe that knowledge should be obtained through using the scientific method. For example, emotions are not measurable so they are irrelevant. Likewise, introspection is rejected.

Positivism adopted David Hume's theory of the nature of reality (i.e., philosophical ontology). Hume believed that reality consists of atomistic (micro-level) and independent events. He believed in the use of the senses to generate knowledge about reality (i.e., scientific method). He thought that philosophical and logical reasoning could lead us to "see" nonexisting links between events occurring simultaneously. However, positivism also adopted Rene Descartes's epistemology (i.e., theory of knowledge). Descartes believed that reason is the best way to generate knowledge about reality. His deductive method implies that events are ordered and interconnected, and therefore reality is ordered and deducible. This internal inconsistency eventually undermined the validity of positivism.

1.8 Empiricism

In the philosophy of science, empiricism is a theory of knowledge which emphasizes those aspects of scientific knowledge that are closely related to experience, especially as formed through deliberate experimental arrangements. It is a fundamental requirement of scientific method that all hypotheses and theories must be tested against observations of the natural world, rather than resting solely on a priori reasoning, intuition, or revelation. Hence, science is considered to be methodologically empirical in nature.

The term "empiricism" has a dual etymology. It comes from the Greek word εμπειρισμός, the Latin translation of which is experiential, from which we derive the word experience. It also derives from a more specific classical Greek and Roman usage of empiric, referring to a physician whose skill derives from practical experience as opposed to instruction in theory.

1.9 Ontology

Ontology is described as the study of being, the nature of reality or existence, as well as the structure of reality (Michael Crotty, 2005). Researcher's position regarding ontology will determine how answers questions about the nature both social and political reality to be investigated (Jonathan Grix, 2002), this means that a researcher's ontological view of the task ahead of him goes a long way to determine the focus of his study, the chosen methods and how data is gathered, interpreted or analyzed.

According to Blaikie, 2007, ontological claims are 'claims and assumptions that are made about the nature of social reality, claims about what exists, what it looks like, what units make it up and how these units interact with each other. In short, ontological assumptions are concerned with what we believe constitutes social reality' (Blaikie, 2007,). Ontological positions can be expressed in terms of objectivism and constructivism also known as subjectivism; the objectivism is of the opinion that social phenomena and their meanings exist in a way that is independent of social actors while subjectivism is the other ontological argument affirming that social phenomena and their meanings are determined by social actors. (Jonathan Grix, 2002).

Blaike (2007) suggests that while carrying out research, a researcher has to choose from being a shallow realist, conceptual realist, cautious realist, depth realist, idealist realist or subtle realist which are the six categories of ontological assumptions that are available for him. A researcher who is subjective in his ontological assumption believes that awareness of our social condition can be achieved through experience and interaction with the environment and as such tends to gather qualitative information for his research, meanwhile, a researcher with objective assumption

believes that there are certain principles that guide the occurrence of events and as such, they can only be tested through quantitative approach; by using data, measurement, statistics and calculation to test the theory and hypothesis governing the principle.

1.10 Logic

Logic has often been described as the study of laws of thought, and logicians say things like "If the argument is valid then, if the premises are true, you are bound to think that the conclusion is true as well" or "If you deny the law of non-contradiction, then you are trying to think the unthinkable." This way of talking suggests that the laws of logic are grounded in laws about how we think, and therefore that there is a psychological basis to logic. The theory that logic is based on psychology was called psychologism.

Gottlob Frege, often regarded as the founder of modern logic, argued against psychologism, and his arguments are usually accepted as definitive. Frege pointed out that people make mistakes in logic all the time, and when you make such mistakes, you're thinking breaks those laws that logicians call the laws of thought. This does not show that logicians have got the Laws of Thought wrong: logicians are concerned not with laws that describe the way we do think, but with laws that describe the way we ought to think, if we want to get at the truth. Psychology looks at the way we think, including fallacies that everyone is prone to, and tries to figure out why we think that way. Logic tries to improve our thinking. When you fail to follow a law of logic, you haven't thought the unthinkable, you were thinking something that could be thought, but it was an irrational thought.

1.11 Rationalism

Rationalism, in Western philosophy, the view that regards reason as the chief source and test of knowledge. Holding that reality itself has an inherently logical structure, the rationalist asserts that a class of truths exists that the intellect can grasp directly. There are, according to the rationalists, certain rational principles—especially in logic and mathematics, and even in ethics and metaphysics—that are so fundamental that to deny them is to fall into contradiction. The rationalists' confidence in reason and proof tends, therefore, to detract from their respect for other ways of knowing.

Rationalism has long been the rival of empiricism, the doctrine that all knowledge comes from, and must be tested by, sense experience. As against this doctrine, rationalism holds reason to be a faculty that can lay hold of truths beyond the reach of sense perception, both in certainty and generality. In stressing the existence of a "natural light," rationalism has also been the rival of systems claiming esoteric knowledge, whether from mystical experience, revelation, or intuition, and has been opposed to various irrationalism that tend to stress the biological, the emotional or volitional, the unconscious, or the existential at the expense of the rational.

Summary

The goal of scientific research is to discover laws and postulate theories that can explain natural or social phenomena, or in other words, build scientific knowledge. It is important to understand that this knowledge may be imperfect or even quite far from the truth.

Social science research is the systematic understanding of social facts or phenomena. It gathers information about the social world, interpreting it in order to make decisions on a course of actions

and/or to develop new knowledge. It attempts to discover cause-and-effect relationships between social problems and answer or solve social problems.

"Social Research may be defined as a scientific undertaking which by means of logical and systematized techniques, aims to discover new factor verify a test old facts, analyze their sequence, interrelationship and causal explanation which were derived within an appropriate theoretical frame of reference, develop new scientific tolls, concepts and theories which would facilities reliable and valid study of human behavior. A researcher's primary goal distant and immediate is to explore and gain an understanding of human behavior and social life and thereby gain a greater control over time".

Keywords

- Social research,
- Empirical,

- Cyclic, research area,
- Literature review,
- Ethical issues,
- Informed consent.

Self Assessment

1. Research is a systematic process

A. True

B. False

2. We need social science to guarantee our democracy.

A. True

B. False

3. Review of Literature is the first stage of research process

A. True

B. False

4. Literature Review is the shortest stage of Research.

A. True

B. False

5. Researcher has to get the informed consent from the respondent to utilize their data in Research.

A. True

B. False

6. There are -------- characteristics of Social Research.

A. 5

B. 10

C. 12

D. 15

7. There are ----- stages in Research process.

A. 4

B. 6

C. 8

D. 10

8. In research process, every step is ---------- with other steps.

A. Interlinked

B. Different

C. Dichotomous

D. None of them

9. Social science research is focused on finding reasons of ------ behavior.

A. Social
B. Animal
C. Human
D. None of them

10. Processing and analyzing data come ------- collection of data.

A. Before
B. After
C. Along with
D. None of them

11. ------ research is the first research to be conducted around a problem that has not been clearly defined.

A. Exploratory
B. Descriptive
C. Explanatory
D. None of them

12. ------ research is also referred to as causal research.

A. Exploratory
B. Descriptive
C. Explanatory
D. None of them

13. -------- is the last stage of research process.

A. Review of Literature
B. Writing the Report
C. Collection of Data.
D. None of them

14. ------- is based on the proven scientific methods derived from real life observations and experimentation.

A. Empirical
B. Cyclic
C. Logical
D. None of them

15. -------- research begins with a question & ends with a question.

A. Empirical
B. Cyclic
C. Logical
D. None of them

Answers for Self Assessment

1.	A	2.	A	3.	B	4.	B	5.	A
6.	A	7.	C	8.	A	9.	C	10.	B
11.	A	12.	C	13.	B	14.	A	15.	C

Review Questions

1. What is Social Research? State its objectives.
2. What are the needs of Social Research?
3. What are the purposes of Research?
4. What are the characteristics of research?
5. What do you mean by research process?
6. Briefly discuss the ethical issues of Social Research.
7. What are the different types of Research?
8. What are the methods of Research?
9. State different stages of Research Process.
10. What are the examples of steps of Research?

Further Readings

- The Practice of Psychological Research by Earl, R. Babbie-13th ed. Wadsworth Publishing Co.inc.2011
- Methods of Psychological Research by Paul, K. Hatt & William, J. Goode. Surjeet Publication. 2018.

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Unit 02: Introduction to Psychological Research

Contents

Objectives

After completion of this unit, the students will be able to:

- understand the meaning of Psychological Research
- know different components of Psychological Research
- familiarize with the applications of Psychological Research

Introduction

Research is a careful investigation or inquiry especially through search for new facts in any branch of knowledge. (The advance learner's dictionary of current English) Research is a systematic, formal,

rigorous and precise process employed to gain solutions to problems or to discover and interpret new facts and relationships (Waltz & Bussell, 1981).

Research is the systematic, controlled, empirical and critical investigation of hypothetical propositions about the presumed relations among natural phenomena (Kerlinger, 1973).

Research is the pursuit of truth through objective and systematic method of finding solutions to a problem (Kothari, 2004). (Niangua, 2013)

Scientific researches are studies that should be systematically planned before performing them. In this review, classification and description of scientific studies, planning stage randomization and bias are explained.

Social science research is focused on finding reasons for human behavior. Social science research is conducted using the scientific method: ask a question, form a hypothesis, conduct empirical research, draw a conclusion, and evaluate the conclusion.

Social Research is a method used by social scientists and researchers to learn about people and societies so that they can design products/services that cater to various needs of the people. Different socio-economic groups belonging to different parts of a county think differently. Various aspects of human behavior need to be addressed to understand their thoughts and feedback about the social world, which can be done using Social Research. Any topic can trigger social research – new feature, new market trend or an upgrade in old technology.

Social Research is conducted by following a systematic plan of action which includes qualitative and quantitative observation methods.

Qualitative methods rely on direct communication with members of a market, observation, text analysis. The results of this method are focused more on being accurate rather than generalizing to the entire population.

Quantitative methods use statistical analysis techniques to evaluate data collected via surveys, polls or questionnaires.

Social Research contains elements of both these methods to analyze a range of social occurrences such as an investigation of historical sites, census of the country, detailed analysis of research conducted to understand reasons for increased reports of molestation in the country etc.

A survey to monitor happiness in a respondent population is one of the most widely used applications of social research. The happiness survey template can be used by researchers an organization to gauge how happy a respondent is and the things that can be done to increase happiness in that respondent.

2.1 Objectives of Psychological Research

Objectives of Social Research The aim of social research, like research in natural sciences, is to discover new facts or verify and test old social facts. It tries to understand human behavior and its interactionwith the environment and social institutions. It tries to find out the causal connection

between human activities and natural laws governing them. It also aims to develop newscientific tools, concepts and theories, which would facilitate the reliable and valid study

of human behavior and social life.Social research follows the norms and tools of natural science, which emphasizes validity, reliability and verifiability of the phenomenon studied. The scientific rigor insocial science research implies objectivity, neutrality and empirically producedevidence. Empiricism comprises of the observation, collection, analysis andinterpretation of data.

2.2 Need for Psychological Research

1. Social scientists help us imagine alternative futures.

Social science can open up debate and give us a say in shaping our collective future. The social sciences developed as a field of study during the nineteenth century. Social science helped people understand the consequences and application of the new technologies of the age, such as steam power.

The growth of railways and factories not only transformed the economy and the world of work, but also changed forever the way people organized their family lives and leisure. Today nanotechnology and advances in medical research will have a significant impact on the way we live.

They present us with a bewildering range of ethical, legal and social issues. But it isn't enough to rely on the scientists. We also need social scientists to analyses and critique what's going on. That way we will make informed choices that shape the future.

The Probationary Imperative: For more ideas on this topic Steve Fuller's books are a good place to start.

2. Social science can help us make sense of our finances.

Social science is not just important for the future but for what's happening now. We all resent paying to withdraw our money from cash machines. Charges can amount to £120 per year. Social scientists working on behalf of the Runnymede Trust found that this doesn't just this depend on where we live, but that black and minority ethnic people are more likely to live in areas where they're forced to pay.

This put pressure on banks to ensure we all have access to machines that don't charge. A range of social scientists – not just economists but also psychologists, sociologists and political scientists, for example - can help us understand the economic crisis and weigh up decisions we make for ourselves and those which governments make on our behalf. Without this kind of analysis, we may feel like pawns in a global game of chess.

With the knowledge and understanding that social science offers us, we will feel empowered to act for ourselves, and to influence decisions being made on our behalf.

Unequal Ageing in Europe: explores the gender pension gap across the 28 member states of the European Union, plus Iceland and Norway

3. Social scientists contribute to our health and well- being.

From sports sociologists to public health experts, from those interpreting medical statistics to those evaluating policies for our care in old age, social scientists are working hard to make sure that our health, leisure and social care services work to best effect.

Social geographers at the University of Sheffield, for example, have shown that those of us who don't follow eating advice are not simply weak- willed or ignorant. Our eating habits are influenced by a whole range of circumstances. Some apparently unhealthy choices may seem rational: if the person doing the shopping knows that others will simply not eat the healthy option and it will just go to waste, they may simply not buy it.

So, it's no good just giving people a booklet on healthy eating. Effective nutritional advice needs to be tailored to people's everyday lives and contexts.

Long-Term Care in Europe: analyzes the key issues at stake in developing long-term care systems for older people in Europe.

4. Social science might save your life.

Psychologists at the University of Liverpool spent time in a steel factory to work out what needs doing to create a safer environment. Accidents at work happen even in the best regulated companies that provide staff training and take all necessary precautions.

A top- down imposed safety regime simply doesn't work. It's when people see unsafe work practices as unacceptable and take decisions as teams that workplaces become safer. Employers need to see people as individuals who take their lead from those with whom they identify. These principles have also been shown to work in crowd control.

When those responsible for crowd management at football matches are trained in techniques which take this into account, there's virtually no trouble.

Adjudicating Employment: Rights compares and analyses institutions for resolving employment rights disputes in ten countries.

5. Social science can make your neighborhood safer.

One common myth is that if you take measures to reduce crime in one neighborhood the criminals simply move on, leading to increased crime in another area. Sociologists at Nottingham Trent University worked closely with police to reduce crime through a method involving scanning for crime patterns.

They were able to identify patterns that regular police work had not picked up, so avoiding guess work and lost time. A technique called situational crime prevention developed by the same team is now regularly used by the police, working with the public and private sectors to prevent crime. Together they make things more difficult for would- be criminals.

For example, in one area there was a serious problem of lead being stolen from community building roofs. By working with dealers in the scrap metal market, and persuading them to keep records, it then became too risky to buy what might be stolen lead.

The Handbook of Security, 2nd edition: is the most comprehensive analysis of scholarly security debates and issues to date.

6. We need social scientists as public intellectuals.

British society is sometimes said to be anti- intellectual. Yet in our fast-changing world, there is a place for the social scientist as public intellectual. This doesn't have to be a succession of boring grey talking heads, such as you can find on French TV any night. That's enough to cause anyone to start channel surfing. Social scientists have a duty to make their work interesting and engaging to the rest of us.

They need to explain not only why social science is relevant but do it in a compelling way. Then we will want to listen, read and find out more. Perhaps more social scientists will have to become active listeners, talking more often to the public, each other and to scientists.

Then we can get all the disciplines around the table together. In a knowledge- based world, we need people who can integrate a variety of different types of knowledge, and that come from different intellectual roots and from a range of institutions to work together.

The Price of Public Intellectuals: is an historically-informed survey critically outlining sociological, psychological, political, and economic approaches to the role of public intellectuals.

7. Social science can improve our children's lives and education.

All societies and all governments want to show they are dong the best for children. Yet too often education reform seems to take place without regard for the best interests of the learners. Education research shows that many parents, particularly parents of younger children, are more concerned that their children enjoy school, than that they are academic stars.

By working with students of all ages to understand their perspectives on schooling, researchers at the universities of Cambridge and Leeds have discovered new insights into what makes effective schools, and what makes for effective school leadership.

We just need to listen to children, provide structured opportunities for them to give their views, and prepare adults to really listen. Today even OFSTED, the school inspection service, has to listen to children's viewpoints.

Informal Education, Childhood and Youth: emphasizes how geography – space and place – matter to informal education practices, through a range of examples.

8. Social science can change the world for the better.

We can generally agree that world needs to be a safer place where all people can enjoy basic dignity and human rights. This is the case even when we can't always agree on what we should do to make this happen. Social scientists working in interdisciplinary teams have made their mark in the area of human welfare and development.

They are concerned with the social and economic advancement of humanity at large. They work with government institutions, UN organizations, social services, funding agencies, and with the media.

They are influencing the work of strategists, planners, teachers and program me officers in developing and growing economies, like India, to influence development so that it impacts on the lives of the poorest members of society. For example, social scientists from the Delhi School of Economics are cooperating with colleagues at SOAS, University of London to explore the impact of legislation in India to guarantee minimum wages for rural unskilled manual labourers on the loves of women.

They found the new law provided opportunities for some women to become wage earners where none had existed before, reducing the risk of hunger and the chances of avoiding hazardous work. But they also identified barriers to women benefitting from the changes, including harassment at the worksite.

Those working in development studies are then able to support women's ability to benefit by looking for creative solutions to such problems.

Why the Social Sciences Matter: provides an illuminating look at topics of concern to everyone at the beginning of the twenty-first century.

9. Social science can broaden your horizons.

For debates about feminism, peace, ecology, social movements, and much more, social science offers each of us new perspectives and new ways of understanding. Whether your idea of relaxation is visiting a museum, watching soaps, or chatting online, social science encourages a fresh look at our everyday activities and culture.

Social scientists at the University of Leicester are making an impact on museums across the world, with the goal of making them more inclusive, abler to challenge prejudices, inspire learning and be more relevant in contemporary society.

One example is their work with the Gallery of Modern Art in Glasgow to involve local communities and international visitors alike in engaging with exhibitions on a range of social justice issues from sectarianism to gay rights, through programs including arts workshops and residencies.

Radical Feminism: is a radical and pioneering feminist manifesto for today's modern audience written by one of the cornerstones of today's feminist scene.

10. We need social science to guarantee our democracy.

Social science offers multiple perspectives on society, informs social policy and supports us in holding our politicians and our media to account.

The Centre for the Study of Global Media and Democracy at Goldsmith's College, London is monitoring how transformation from traditional to digital media is examining the move away from traditional journalism and politics to where we as citizens try to be community journalists, presenting our own accounts on- line. The work brings together specialists in media and communications, sociology and politics.

Individual citizens may feel empowered by this but there are risks in turning away from traditional journalism, including fewer opportunities for in- depth analysis and critique of powerful interests. This work by social scientists is critical in protecting a modern and transparent democracy. Just think what might happen without it!

2.3 What is the Research Process?

The Research Process is a process of multiple scientific steps in conducting the research work. Each step is interlinked with other steps. The process starts with the research problem at first. Then it advances in the next steps sequentially.

Generally, a researcher conducts research work within seven steps. In research work, primarily, you require a Research Proposal. It is because the proposal approves the research project whether you achieve the ability to conduct research or not. So when you write a research proposal, present the detailed plans and specific objectives of your research correctly.

Stages in the Research Process

These 8 stages in the Research Process are;

1. Identifying the problem.
2. Reviewing literature.
3. Setting research questions, objectives, and hypotheses.
4. Choosing the study design.
5. Deciding on the sample design.
6. Collecting data.
7. Processing and analyzing data.
8. Writing the report.

Dissertation markers expect the explanation of research process to be included in Methodology chapter. A typical research process comprises the following stages:

1. ***Selecting the research area.*** You are expected to state that you have selected the research area due to professional and personal interests in the area and this statement must be true. The importance of this first stage in the research process is often underestimated by many students. If you find research area and research problem that is genuinely interesting to you it is for sure that the whole process of writing your dissertation will be much easier. Therefore, it is never too early to start thinking about the research area for your dissertation.

2. ***Formulating research aim, objectives and research questions or developing hypotheses***. The choice between the formulation of research questions and the development of hypotheses depends on your research approach as it is discussed further below in more details. Appropriate research aims and objectives or hypotheses usually result from several attempts and revisions and these need to be mentioned in Methodology chapter. It is critically important to get your research questions or hypotheses confirmed by your supervisor before moving forward with the work.

3. ***Conducting the literature review.*** Literature review is usually the longest stage in the research process. Actually, the literature review starts even before the formulation of research aims and objective; because you have to check if exactly the same research problem has been addressed before. Nevertheless, the main part of the literature review is conducted after the formulation of research aim and objectives. You have to use a wide range of secondary data sources such as books, newspapers, magazines, journals, online articles etc.

4. ***Selecting methods of data collection.*** Data collection method(s) need to be selected on the basis of critically analyzing advantages and disadvantages associated with several alternative data collection methods. In studies involving primary data collection, in-depth discussions of advantages and disadvantages of selected primary data collection method(s) need to be included in methodology.

5. ***Collecting the primary data.*** Primary data collection needs to be preceded by a great level of preparation and pilot data collection may be required in case of questionnaires. Primary data collection is not a compulsory stage for all dissertations and you will skip this stage if you are conducting desk-based research.

6. ***Data analysis.*** Analysis of data plays an important role in the achievement of research aim and objectives. Data analysis methods vary between secondary and primary studies, as well as, between qualitative and quantitative studies.

7. ***Reaching conclusions.*** Conclusions relate to the level of achievement of research aims and objectives. In this final part of your dissertation, you will have to justify why you think that research aims and objectives have been achieved. Conclusions also need to cover research limitations and suggestions for future research.

2.4 Research Question

What is a Research Question?

As their name implies, research questions are often grounded on research. As a result, these questions are dynamic; this means researchers can change or refine the research question as they review related literature and develop a framework for the study. While many research projects will focus on a single research question, larger studies often use more than one research question.

2.5 Importance of the Research Question

The primary importance of framing the research question is that it narrows down a broad topic of interest into a specific area of study (Creswell, 2014). Research questions, along with hypotheses, also serve as a guiding framework for research. These questions also specifically reveal the boundaries of the study, setting its limits, and ensuring cohesion.

Moreover, the research question has a domino effect on the rest of the study. These questions influence factors, such as the research methodology, sample size, data collection, and data analysis (Lipowski, 2008).

In the social sciences, the research problem establishes the means by which you must answer the "So What" question. The "So What" question refers to a research problem surviving the relevancy test [the quality of a measurement procedure that provides repeatability and accuracy]. Note that

answering the "So What" question requires a commitment on your part to not only show that you have researched the material, but that you have thought about its significance.

To survive the "So What" question, problem statements should possess the following attributes:

- Clarity and precision [a well-written statement does not make sweeping generalizations and irresponsible statements],
- Demonstrate a researchable topic or issue [i.e., feasibility of conducting the study is based upon access to information that can be effectively acquired, interpreted, synthesized, and understood],
- Identification of what would be studied, while avoiding the use of value-laden words and terms,
- Identification of an overarching question or small set of questions accompanied by key factors or variables,
- Identification of key concepts and terms,
- Articulation of the study's boundaries or parameters or limitations,
- Some generalizability in regards to applicability and bringing results into general use,
- Conveyance of the study's importance, benefits, and justification [i.e., regardless of the type of research, it is important to demonstrate that the research is not trivial],
- Does not have unnecessary jargon or overly complex sentence constructions; and,
- Conveyance of more than the mere gathering of descriptive data providing only a snapshot of the issue or phenomenon under investigation.

Bryman, Alan. "The Research Question in Social Research: What is its Role?" International Journal of Social Research Methodology 10 (2007): 5-20; Castellanos, Susie. Critical Writing and Thinking. The Writing Centre. Dean of the College. Brown University; Ellis, Timothy J. and Yair Levy Nova Framework of Problem-Based Research: A Guide for Novice Researchers on the Development of a Research-Worthy Problem. Informing Science: the International Journal of an Emerging Trans discipline 11 (2008); Thesis and Purpose Statements. The Writer's Handbook. Writing Centre. University of Wisconsin, Madison; Thesis Statements. The Writing Centre. University of North Carolina; Tips and Examples for Writing Thesis Statements. The Writing Lab and the OWL. Purdue University.

2.6 Comparing Research Strategies

Research questions can be classified into different categories, depending on the type of research to be done. Knowing what type of research, one wants to do—quantitative, qualitative, or mixed-methods studies—can help in determining the best type of research question to use.

Doody and Bailey (2016) suggest a number of common types of research questions, as outlined below.

Quantitative Research Questions

Quantitative research questions are precise. These questions typically include the population to be studied, dependent and independent variables, and the research design to be used. They are usually framed and finalized at the start of the study (Berger, 2015).

Quantitative research questions are precise. These questions typically include the population to be studied, dependent and independent variables, and the research design to be used. They are usually framed and finalized at the start of the study (Berger, 2015).

Quantitative research questions also establish a link between the research question and the research design. Moreover, these questions are not answerable with "yes" or "no" responses. As a result, quantitative research questions don't use words such as "is," "are," "do," or "does."

Quantitative research questions usually seek to understand particular social, familial, or educational experiences or processes that occur in a particular context and/or location (Marshall & Rossman, 2011). They can be further categorized into three types: descriptive, comparative, and relationship.

Qualitative Research Questions

Qualitative research questions may concern broad areas of research or more specific areas of study. Similar to quantitative research questions, qualitative research questions are linked to research design. Unlike their quantitative counterparts, though, qualitative research questions are usually adaptable, non-directional, and more flexible (Creswell, 2013). As a result, studies using these questions generally aim to "discover," "explain," or "explore."

Descriptive research questions aim to measure the responses of a study's population to one or more variables or describe variables that the research will measure. These questions typically begin with "what."

Comparative research questions aim to discover the differences between two or more groups for an outcome variable. These questions can be causal, as well. For instance, the researcher may compare a group where a certain variable is involved and another group where that variable is not present.

Relationship research questions seek to explore and define trends and interactions between two or more variables. These questions often include both dependent and independent variables and use words such as "association" or "trends."

Mixed-methods studies

Mixed-methods studies typically require a set of both quantitative and qualitative research questions. Separate questions are appropriate when the mixed-methods study focuses on the significance and differences in quantitative and qualitative methods and not on the study's integrative component (Tashakkori& Teddlie, 2010).

Researchers also have the option to develop a single mixed-methods research question. According to Tashakkori and Teddlie (2010), this suggests an integrative process or component between the study's quantitative and qualitative research methods.

2.7 Formulating Research Question

Developing the right research question is a critical first step in the research process. The key points outlined below should help researchers in the pursuit.

The development of a research question is an iterative process that involves continuously updating one's knowledge on the topic and refining ideas at all stages (Maxwell, 2013).

Remain updated on current trends, state-of-the-art research studies, and technological advances in the field of study you are pursuing.

Remain updated on current trends, state-of-the-art research studies, and technological advances in the field of study you are pursuing.

Make the research question as specific and concise as possible to ensure clarity. Avoid using words or terms that don't add to the meaning of the research question.

Aside from doing a literature review, seek the input of experts in the field, mentors, and colleagues. Such inputs can prove beneficial not only for the research question but also for creating the rest of the study.

Finally, refrain from committing the two most common mistakes in framing research questions: posing a question as an anticipated contribution and framing a question as a method (Mayo et al., 2013).

Steps to Developing a Good Research Question

Start with a broad topic.

A broad topic provides writers with plenty of avenues to explore in their search for a viable research question. Techniques to help you develop a topic into subtopics and potential research

questions include brainstorming and concept mapping. These techniques can organize your thoughts so you can identify connections and relevant themes within a broad topic.

When searching for a topic, it's wise to choose an area of study that you are genuinely interested in, since your interest in a topic will affect your motivation levels throughout your research. It's also wise to consider the interests being addressed recently by the research community, as this may affect your paper's chances of getting published.

Do preliminary research to learn about topical issues.

Once you have picked a topic, you can start doing preliminary research. This initial stage of research accomplishes two goals. First, a preliminary review of related literature allows you to discover issues that are currently being discussed by scholars and fellow researchers. This way, you get up-to-date, relevant knowledge on your topic.

Second, a preliminary review of related literature allows you to spot existing gaps or limitations in existing knowledge of your topic. With a certain amount of fine-tuning, you can later use these gaps as the focus of your research question.

Moreover, according to Farrugia et al. (2010), certain institutions that provide grants encourage applicants to conduct a systematic review of available studies and evidence to see if a similar, recent study doesn't already exist, before applying for a grant.

Narrow down your topic and determine potential research questions.

Once you have gathered enough knowledge on the topic you want to pursue, you can start focusing on a more specific area of study. One option is to focus on gaps in existing knowledge or recent literature. Referred to by Sandberg and Alvesson (2011) as "gap-spotting," this method involves constructing research questions out of identified limitations in literature and overlooked areas of study. Similarly, researchers can choose research questions that extend or complement the findings of existing literature.

Another way of identifying and constructing research questions: problematization (Sandberg & Alvesson, 2011). As a methodology for constructing research questions, problematization aims to challenge and scrutinize assumptions that support others and the researcher's theoretical position. This means constructing research questions that challenge your views or knowledge of the area of study.

Lipowski (2008), on the other hand, emphasizes the importance of taking into consideration the researcher's personal experiences in the process of developing a research question. Researchers who are also practitioners, for instance, can reflect on problematic areas of their practice. Patterns and trends in practice may also provide new insights and potential ideas for research questions.

Evaluate the soundness of your research question.

Your initial research and review of related literature will have produced some interesting questions that seem like they're worth pursuing. However, not all interesting questions make for sound research questions. Keep in mind that a research question draws its answer or conclusion through an analysis of evidence.

Hulley et al. (2007) suggest using a set of criteria- known as the "FINER" criteria-to find out if you have a good research question. The FINER criteria are outlined below:

F – Feasible

I – Interesting

N – Novel

E – Ethical

R – Relevant

Construct your research question properly.

Research questions should be structured properly to ensure clarity. There are a number of frameworks that you can use for properly constructing a research question. The two most commonly used frameworks are explained below.

PICOT Framework

The PICOT framework was first introduced in 1995 by Richardson et al. Using the PICOT framework; research questions can be constructed to address important elements of the study, including the population to be studied, the expected outcomes, and the time it takes to achieve the outcome. With these elements, the framework is more commonly used in clinical research and evidence-based studies.

P – population, patients, or problems.

I – intervention or indicator being studied.

C – comparison group.

O – outcome of interest.

T – timeframe of the study affects your paper's

chances of getting published.

PEO framework

Like the PICOT framework, the PEO framework is commonly used in clinical studies as well. However, this framework is more useful for qualitative research questions. This framework includes these elements:

P – population being studied

E – exposure to preexisting conditions

O – outcome of interest

Structure and Writing Style

Types and Content

Structure and Writing Style

There are four general conceptualizations of a research problem in the social sciences:

Casuist Research Problem -- this type of problem relates to the determination of right and wrong in questions of conduct or conscience by analyzing moral dilemmas through the application of general rules and the careful distinction of special cases.

Difference Research Problem -- typically asks the question, "Is there a difference between two or more groups or treatments?" This type of problem statement is used when the researcher compares or contrasts two or more phenomena.

Descriptive Research Problem -- typically asks the question, "what is...?" with the underlying purpose to describe a situation, state, or existence of a specific phenomenon.

Relational Research Problem -- suggests a relationship of some sort between two or more variables to be investigated. The underlying purpose is to investigate qualities/characteristics that are connected in some way.

- A problem statement in the social sciences should contain:
- A lead-in that helps ensure the reader will maintain interest over the study,

- A declaration of originality [e.g., mentioning a knowledge void, that will be supported by the literature review],
- An indication of the central focus of the study [establishing the boundaries of analysis], and
- An explanation of the study's significance or the benefits to be derived from an investigating the research problem.

Research Questions are often grounded on research. As a result, these questions are dynamic; this means researchers can change or refine the research question as they review related literature and develop a framework for the study. While many research projects will focus on a single research question, larger studies often use more than one research question.

Sources of Problems for Investigation

Identifying a problem to study can be challenging, not because there's a lack of issues that could be investigated, but due to pursuing a goal of formulating an academically relevant and researchable problem that is unique and does not simply duplicate the work of others. To facilitate how you might select a problem from which to build a research study, consider these sources of inspiration:

Deductions from Theory

This relates to deductions made from social philosophy or generalizations embodied in life in society that the researcher is familiar with. These deductions from human behavior are then fitted within an empirical frame of reference through research. From a theory, the researcher can formulate a research problem or hypothesis stating the expected findings in certain empirical situations. The research asks the question: "What relationship between variables will be observed if theory aptly summarizes the state of affairs?" One can then design and carry out a systematic investigation to assess whether empirical data confirm or reject the hypothesis, and hence, the theory.

Interdisciplinary Perspectives

Identifying a problem that forms the basis for a research study can come from academic movements and scholarship originating in disciplines outside of your primary area of study. A review of pertinent literature should include examining research from related disciplines that can reveal new avenues of exploration and analysis. An interdisciplinary approach to selecting a research problem offers an opportunity to construct a more comprehensive understanding of a very complex issue that any single discipline may be able to provide.

Interviewing Practitioners

The identification of research problems about particular topics can arise from formal or informal discussions with practitioners who provide insight into new directions for future research and how to make research findings more relevant to practice. Discussions with experts in the field, such as, teachers, social workers, health care providers, lawyers, business leaders, etc., offers the chance to identify practical, "real world" problems that may be understudied or ignored within academic circles. This approach also provides some practical knowledge which may help in the process of designing and conducting your study.

Personal Experience

Your everyday experiences can give rise to worthwhile problems for investigation. Think critically about your own experiences and/or frustrations with an issue facing society, your community, your neighborhood, your family, or your personal life. This can be derived, for example, from deliberate observations of certain relationships for which there is no clear explanation or witnessing an event that appears harmful to a person or group or that is out of the ordinary.

Relevant Literature

The selection of a research problem can be derived from an extensive and thorough review of pertinent research associated with your overall area of interest. This may reveal where gaps exist in our understanding of a topic. Research may be conducted to: 1) fill such gaps in knowledge; 2) evaluate if the methodologies employed in prior studies can be adapted to solve other problems; or, 3) determine if a similar study could be conducted in a different subject area or applied to different study sample [i.e., different groups of people]. Also, authors frequently conclude their studies by noting implications for further research; this can also be a valuable source of new problems to investigate.

What Makes a Good Research Statement?

A good problem statement begins by introducing the broad area in which your research is centered and then gradually leads the reader to the narrower questions you are posing. The statement need not be lengthy but a good research problem should incorporate the following features:

Compelling topic

Simple curiosity is not a good enough reason to pursue a research study. The problem that you choose to explore must be important to you, your readers, and to a larger community you share. The problem chosen must be one that motivates you to address it.

Supports multiple perspectives

The problem most be phrased in a way that avoids dichotomies and instead supports the generation and exploration of multiple perspectives. A general rule of thumb is that a good research problem is one that would generate a variety of viewpoints from a composite audience made up of reasonable people.

Researchable

It seems a bit obvious, but you don't want to find yourself in the midst of investigating a complex research project and realize that you don't have much to draw on for your research. Choose research problems that can be supported by the resources available to you. Not sure? Seek out help from a librarian!

NOTE: Do not confuse a research problem with a research topic. A topic is something to read and obtain information about whereas a problem is something to be solved or framed as a question that must be answered.

Examples of Good and Bad Research Questions

The following examples of good and bad research questions can further guide researchers on properly constructing a research question.

Example no. 1

Bad: How does social media affect people's behavior?

Good: What effect does the daily use of YouTube have on the attention span of children aged under 16?

The first research question is considered bad because of the vagueness of "social media" as a concept and the question's lack of specificity. A good research question should be specific and focused, and its answer should be discovered through data collection and analysis.

Example no. 2

Bad: Has there been an increase in childhood obesity in the US in the past 10 years?

Good: How have school intervention programs and parental education levels affected the rate of childhood obesity among 1st to 6th-grade students?

In the second example, the first research question is not ideal because it's too simple, and it's easily answerable by a "yes" or "no." The second research question is more complicated; to answer it, the researcher must collect data, perform in-depth data analysis, and form an argument that leads to further discussion.

Mistakes to Avoid

Beware of circular reasoning! Don't state that the research problem as simply the absence of the thing you are suggesting. For example, if you propose the following: "The problem in this community is that there is no hospital."

- This only leads to a research problem where:
- The need is for a hospital
- The objective is to create a hospital
- The method is to plan for building a hospital, and
- The evaluation is to measure if there is a hospital or not.

This is an example of a research problem that fails the "So What?" test. In this example, the problem does not reveal the relevance of why you are investigating the fact there is no hospital in the community [e.g., there's a hospital in the community ten miles away]; it does not elucidate the significance of why one should study the fact there is no hospital in the community [e.g., that hospital in the community ten miles away has no emergency room]; and, the research problem does not offer an intellectual pathway towards adding new knowledge or clarifying prior knowledge [e.g., the county in which there is no hospital already conducted a study about the need for a hospital].

Important Points to Keep in Mind in Creating a Research Question

Developing the right research question is a critical first step in the research process. The key points outlined below should help researchers in the pursuit:

The development of a research question is an iterative process that involves continuously updating one's knowledge on the topic and refining ideas at all stages (Maxwell, 2013).

Remain updated on current trends, state-of-the-art research studies, and technological advances in the field of study you are pursuing.

Make the research question as specific and concise as possible to ensure clarity. Avoid using words or terms that don't add to the meaning of the research question.

Aside from doing a literature review, seek the input of experts in the field, mentors, and colleagues. Such inputs can prove beneficial not only for the research question but also for creating the rest of the study.

Finally, refrain from committing the two most common mistakes in framing research questions: posing a question as an anticipated contribution and framing a question as a method (Mayo et al., 2013).

Conclusion

A research question is usually the first step in any research project. Basically, it is the primary interrogation point of your research and it sets the pace for your work.

Typically, a research question focuses on the research, determines the methodology and hypothesis, and guides all stages of inquiry, analysis, and reporting. With the right research questions, you will be able to gather useful information for your investigation.

Summary

The goal of scientific research is to discover laws and postulate theories that can explain natural or social phenomena, or in other words, build scientific knowledge. It is important to understand that this knowledge may be imperfect or even quite far from the truth.

Social science research is the systematic understanding of social facts or phenomena. It gathers information about the social world, interpreting it in order to make decisions on a course of actions

and/or to develop new knowledge. It attempts to discover cause-and-effect relationships between social problems and answer or solve social problems.

"Social Research may be defined as a scientific undertaking which by means of logical and systematized techniques, aims to discover new factor verify a test old facts, analyze their sequence, interrelationship and causal explanation which were derived within an appropriate theoretical frame of reference, develop new scientific tolls, concepts and theories which would facilities reliable and valid study of human behavior. A researcher's primary goal distant and immediate is to explore and gain an understanding of human behavior and social life and thereby gain a greater control over time".

Keywords

- Social research,
- Empirical,
- Cyclic, research area,
- Literature review,
- Ethical issues,
- Informed consent.

Self Assessment

1. Research is a systematic process

A. True

B. False

2. We need social science to guarantee our democracy.

A. True

B. False

3. Review of Literature is the first stage of research process

A. True

B. False

4. Literature Review is the shortest stage of Research.

A. True

B. False

5. Researcher has to get the informed consent from the respondent to utilize their data in Research.

A. True

B. False

6. There are -------- characteristics of Social Research.

A. 5

B. 10

C. 12

D. 15

7. There are ----- stages in Research process.

A. 4
B. 6
C. 8
D. 10

8. In research process, every step is ---------- with other steps.
A. Interlinked
B. Different
C. Dichotomous
D. None of them

9. Social science research is focused on finding reasons of ------ behavior.
A. Social
B. Animal
C. Human
D. None of them

10. Processing and analyzing data come ------- collection of data.
A. Before
B. After
C. Along with
D. None of them

11. ------ research is the first research to be conducted around a problem that has not been clearly defined.
A. Exploratory
B. Descriptive
C. Explanatory
D. None of them

12. ------ research is also referred to as causal research.
A. Exploratory
B. Descriptive
C. Explanatory
D. None of them

13. -------- is the last stage of research process.
A. Review of Literature
B. Writing the Report
C. Collection of Data.
D. None of them

14. ------- is based on the proven scientific methods derived from real life observations and experimentation.

A. Empirical
B. Cyclic
C. Logical
D. None of them

15. -------- research begins with a question & ends with a question.

A. Empirical
B. Cyclic
C. Logical
D. None of them

Answers for Self Assessment

1.	A	2.	A	3.	B	4.	B	5.	A
6.	A	7.	C	8.	A	9.	C	10.	B
11.	A	12.	C	13.	B	14.	A	15.	C

Review Questions

1. What is Social Research? State its objectives.
2. What are the needs of Social Research?
3. What are the purposes of Research?
4. What are the characteristics of research?
5. What do you mean by research process?
6. Briefly discuss the ethical issues of Social Research.
7. What are the different types of Research?
8. What are the methods of Research?
9. State different stages of Research Process.
10. What are the examples of steps of Research?

Further Readings

- The Practice of Psychological Research by Earl, R. Babbie-13th ed. Wadsworth Publishing Co.inc.2011
- Methods of Psychological Research by Paul, K. Hatt& William, J. Goode. Surjeet Publication. 2018.

Unit 3: Major Research Divisions

Objectives

After completion of this Unit, the students will be able to:

- understand the concept of Research
- know about different facets of Research
- familiarize with the research Process.

Introduction

Research is defined as careful consideration of study regarding a particular concern or problem using scientific methods. "Research is a systematic inquiry to describe, explain, predict, and control the observed phenomenon. It involves inductive and deductive methods."- Earl Robert Babbie

- Inductive research methods analyze an observed event, while deductive methods verify the observed event.
- Inductive approaches are associated with qualitative research, and deductive methods are more commonly associated with quantitative analysis.

3.1. Research

Definition

Research is a process of systematic inquiry that entails collection of data; documentation of critical information; and analysis and interpretation of that data/information, in accordance with suitable methodologies set by specific professional fields and academic disciplines.

Objectives of Research

- To find out the real facts
- To achieve the new thoughts
- To evaluate the information
- To test a hypothesis
- To design or implement the research
- To improve the understanding

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

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

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

The final part of clarifying your research project involves thinking in more detail about your research objectives. Research objectives should be closely related to the statement of the problem and summarize what you hope will be achieved by the study. , if the problem identified is low utilization of antenatal care services, the general objective of the study could be to identify the reasons for this low uptake, in order to find ways of improving it.

Objectives can be general or specific. The general objective of your study states what you expect to achieve in general terms. Specific objectives break down the general objective into smaller, logically connected parts that systematically address the various aspects of the problem.

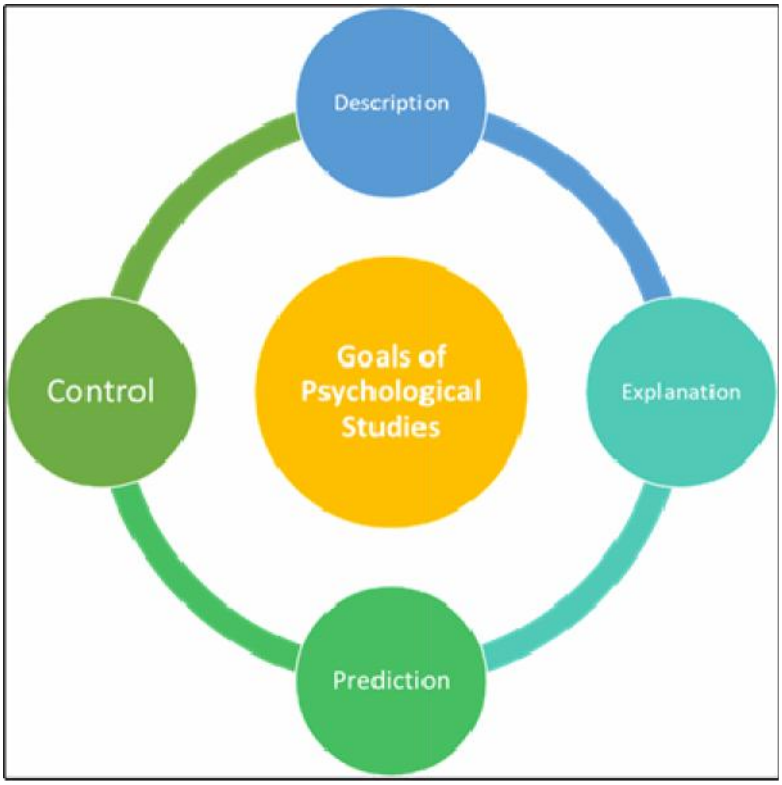
Goals of Research

The primary goal or purpose of research in any field of inquiry; is to add to what is known about the phenomenon under investigation through the application of scientific methods.

Though each research has its own specific goals, yet we may enumerate the following 4 broad goals of scientific research:

- Exploration.
- Description.
- Causal explanation.
- Prediction.

The link between the 4 goals of research and the questions raised in reaching these goals.



Research Approaches

There are two main approaches to doing research.

The first is the basic approach, which mostly pertains to academic research. Many people view this as pure research or fundamental research.

The research implemented through the second approach is variously known as applied research, action research, operations research, or a contract research approach.

Also, the third category of research, called evaluative research, is of importance in many applications. All these approaches have different purposes which influence the nature of the respective research.

Lastly, precautions in research are required for thorough research.

- Basic Research.
- Applied Research.
- Evaluative Research.
- Precautions in Research

Areas of Research

The most important fields of research, among others, are;

- Social Research.
- Health Research.
- Population Research.
- Business Research.
- Marketing Research.
- Agricultural Research.
- Biomedical Research.

- Clinical Research.
- Outcomes Research.
- Internet Research.
- Archival Research.
- Empirical Research.
- Legal Research.
- Education Research.
- Engineering Research.
- Historical Research

Precautions in Research

Whether a researcher is doing applied or basic research or research of any other form, he or she must take necessary precautions to ensure that the research he or she is doing is relevant, timely, efficient, accurate, and ethical.

The research is considered relevant if it anticipates the kinds of information that will be required by decision-makers, scientists, or policymakers.

Timely research is completed in time to influence decisions.

Research is efficient when it is of the best quality for the minimum expenditure, and the study is appropriate to the research context.

Research is considered accurate or valid when the interpretation can account for both consistencies and inconsistencies in the data.

Research is ethical when it can promote trust, exercise care, ensure standards, and protect the rights of the participants in the research process.

Importance of Research

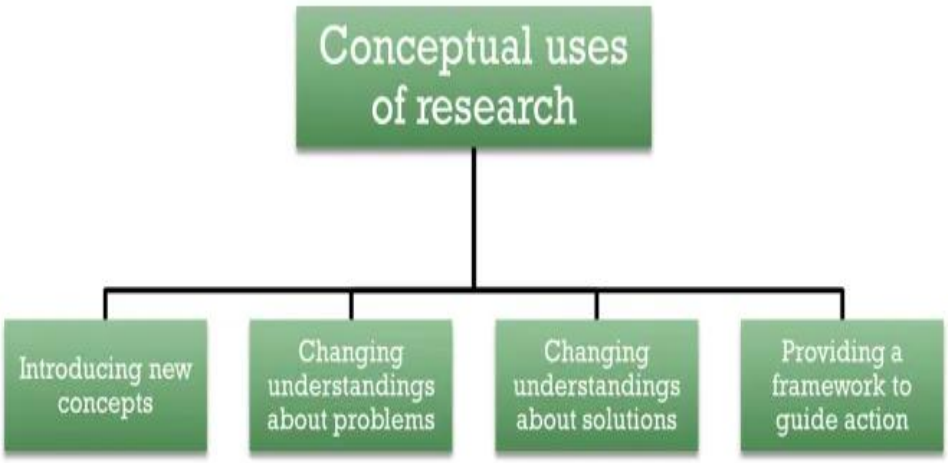
- It's a tool for building knowledge and facilitating learning.
- It's a means to understand issues and increase public awareness.
- It helps us succeed in business.
- It allows us to disprove lies and support truths.
- It is a means to find, gauge, and seize opportunities.
- It promotes a love of and confidence in reading, writing, analyzing, and sharing valuable information.
- It provides nourishment and exercise for the mind.

Conceptual use of Research

- Engagement with research can introduce new concepts
- Enables people to see a problem they didn't see before
- Findings from research can help broaden or narrow understandings about the kinds of solutions should be considered and are most appropriate to pursue
- Research can also provide a framework to guide action

The conceptual use of research is a potentially powerful way to inform policy. When used conceptually, research serves to introduce new ideas, help people identify problems and appropriate solutions in new ways, and provide new frameworks to guide thinking and action. What's more, the conceptual use of research can have long-term consequences. Rather than influencing a single decision, it shapes how people see the world, how they respond to problems they encounter in their everyday work, and how they design and manage solutions. It touches not

only policymaking but also policy implementation. We agree with Carol Weiss, who argued "…this process—bringing new perspectives to attention and formulating issues for resolution—may be the most important contribution that social research makes to government policy."



Benefits of Research

The benefits for students engaged in research and creative work are numerous.

Educational Benefits

- Working with a faculty mentor
- Learning about issues, methods, and leaders in your chosen field
- Applying concepts from your courses to "real life" situations
- Furthering your creative achievement
- Sharpening your problem-solving skills

Professional Benefits

- Exploring potential careers
- Enhancing your professional communication skills
- Learning new techniques and skills for your career
- Preparing for graduate or professional school
- Networking with others who share your interests

Personal Benefits

- Growing as a critical, independent thinker
- Building confidence and the ability to work independently
- Enhancing your awareness of ethical issues

Characteristics of Research

- Good research follows a systematic approach to capture accurate data. Researchers need to practice ethics and a code of conduct while making observations or drawing conclusions.

- The analysis is based on logical reasoning and involves both inductive and deductive methods.
- Real-time data and knowledge are derived from actual observations in natural settings.
- There is an in-depth analysis of all data collected so that there are no anomalies associated with it.
- Good research follows a systematic approach to capture accurate data. Researchers need to practice ethics and a code of conduct while making observations or drawing conclusions.
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- There is an in-depth analysis of all data collected so that there are no anomalies associated with it.
- It creates a path for generating new questions. Existing data helps create more research opportunities.
- It is analytical and uses all the available data so that there is no ambiguity in inference.
- Accuracy is one of the most critical aspects of research. The information must be accurate and correct. laboratories provide a controlled environment to collect data. Accuracy is measured in the instruments used, the calibrations of instruments or tools, and the experiment's result.

Purpose of Research

3.2. Exploratory Research:

As the name suggests, researchers conduct exploratory studies to explore a group of questions. The answers and analytics may not offer a conclusion to the perceived problem. It is undertaken to handle new problem areas that haven't been explored before. This exploratory process lays the foundation for more conclusive data collection and analysis.

3.3. Descriptive Research:

It focuses on expanding knowledge on current issues through a process of data collection. Descriptive studies describe the behavior of a sample population. Only one variable is required to conduct the study. The three primary purposes of descriptive studies are describing, explaining, and validating the findings. a study conducted to know if top-level management leaders in the 21st century possess the moral right to receive a considerable sum of money from the company profit.

3.4. Explanatory Research:

Causal or explanatory research is conducted to understand the impact of specific changes in existing standard procedures. Running experiments is the most popular form. For example, a study that is conducted to understand the effect of rebranding on customer loyalty.

The purpose of research can be a complicated issue and varies across different scientific fields and disciplines. At the most basic level, science can be split, loosely, into two types, 'pure research' and 'applied research'.

Both of these types follow the same structures and protocols for propagating and testing hypotheses and predictions, but vary slightly in their ultimate purpose.

An excellent example for illustrating the difference is by using pure and applied mathematics. Pure math is concerned with understanding underlying abstract principles and describing them with elegant theories. Applied math, by contrast, uses these equations to explain real life phenomena, such as mechanics, ecology and gravity.

3.5. Action Research

Action research involves a systematic process of examining the evidence. The results of this type of research are practical, relevant, and can inform theory. Action research is different than other forms of research as there is less concern for universality of findings, and more value is placed on the relevance of the findings to the researcher and the local collaborators.

3.6. Applied Scientific Research

Applied scientists might look for answers to specific questions that help humanity, for example medical research or environmental studies. Such research generally takes a specific question and tries to find a definitive and comprehensive answer.

The purpose of research is about testing theories, often generated by pure science, and applying them to real situations, addressing more than just abstract principles.

Applied scientific research can be about finding out the answer to a specific problem, such as 'Is global warming avoidable?' or 'Does a new type of medicine really help the patients?'

PURPOSES OF RESEARCH

PURPOSE	AIMS	SOURCES	SAMPLES
EXPLORATORY	-To explore a new topic/issue in order to learn about it -To satisfy the researcher's curiosity and desire for better understanding, -To test the feasibility of undertaking a more extensive study -Addresses the "what" question: "what is this phenomena really about?"	-Experience surveys -Secondary data analysis -Case studies -Pilot studies -Focus groups or small group discussions	Study on what stem cell therapy is all about
DESCRIPTIVE	-To describe situations and events -To present a picture of the specific details (or gather info) of a situation, social setting, or relationship -Focus on `who,' `what,' `when,' `where,' and `how' but *not* why?	-data-gathering techniques -surveys -field research -content analysis	Labor Force Surveys, Population Census, (including race/ethnicity, age, sex, household size, income, etc.) and Educational surveys
EXPLANATORY	-To know "why," to explain things, looks for causes and reasons -Builds on exploratory and descriptive research and goes on to identify the reasons for something that occurs. -To extend a theory or principle to new areas, new issues, new topics -To provide evidence to support or refute an explanation or prediction. -To test a theory's predictions or principle	All of the above	For example, reporting the autism rates of different cities is descriptive. Identifying the variables that explain why some cities have higher autism rates than others involves explanation. Likewise, reporting the frequency of school attendance is descriptive, but reporting why some people attend school while others don't is explanatory.

Types of Research Methods

Qualitative methods

Qualitative research is a method that collects data using conversational methods, usually open-ended questions. The responses collected are essentially non-numerical. This method helps a researcher understand what participants think and why they think in a particular way.

Research methods are broadly classified as Qualitative and Quantitative.

Both methods have distinctive properties and data collection methods.

Types of qualitative methods include:

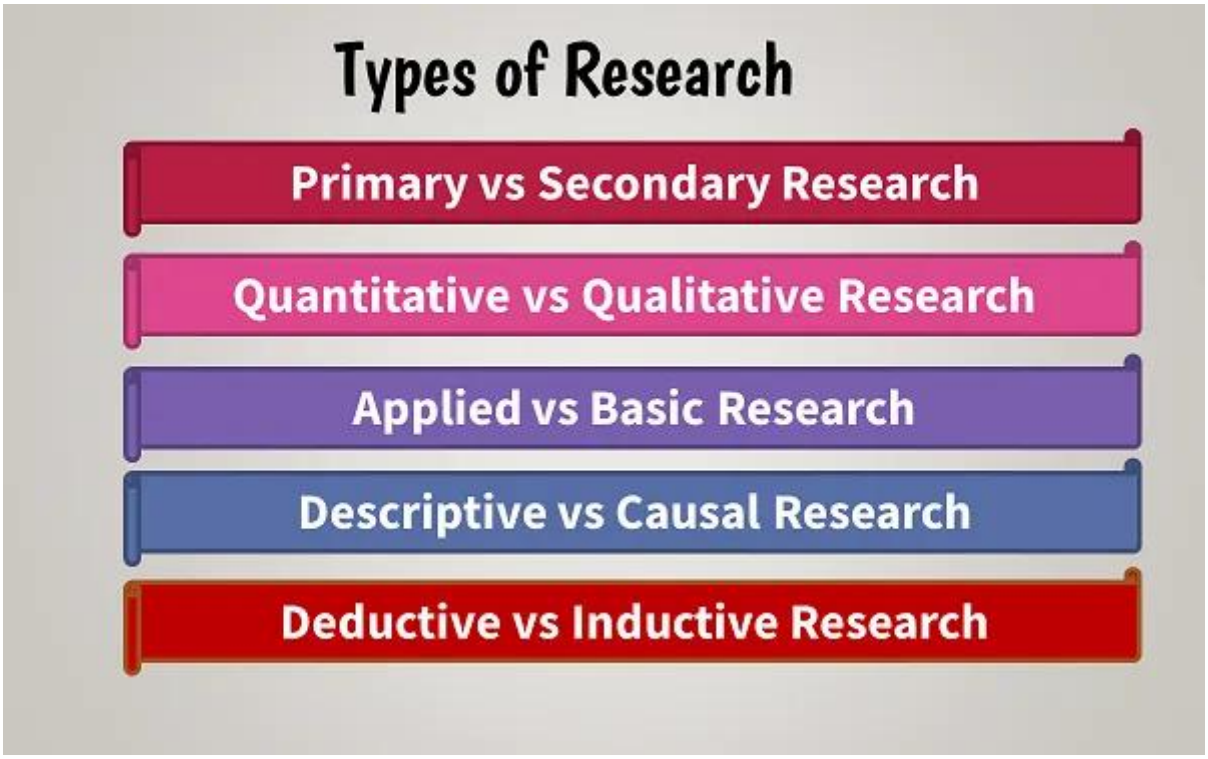
- One-to-one Interview
- Focus Groups
- Ethnographic studies
- Text Analysis
- Case Study

Quantitative methods

Quantitative methods deal with numbers and measurable forms. It uses a systematic way of investigating events or data. It answers questions to justify relationships with measurable variables to either explain, predict, or control a phenomenon.

Types of quantitative methods include:

- Survey research
- Descriptive research
- Correlational research



Summary

- Research is the organized and systematic method of finding answers to questions.
- It is systematic because it is a process broken up into clear steps that lead to conclusions.
- Research is organized because there is a planned structure or method used to reach the conclusion.
- Research is only successful if we find answers, whether we like these answers or not.
- Development research is focused on relevant, useful and important questions. If there are no questions, there can be no research.

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Research is only successful if we find answers, whether we like these answers or not. Development research is focused on relevant, useful and important questions. If there are no questions, there can be no research.

Keywords

Philosophical roots, objectives, goals, purpose, characteristics, conceptual use, importance, approaches, types, precautions.

Self Assessment

1. Research is a process of systematic enquiry.

A. True

B. False

2. There are seven objectives in a Research.

A. True

B. False

3. There are four goals of Research.

A. True

B. False

4. The research is considered relevant if the findings will be required by the policy makers or scientists.

A. True

B. False

5. Research is ethical when it promotes trust.

A. True

B. False

6. Inductive Research method----------

A. Verify an observed event

B. Analyze an observed event

C. Correlate an observed event

D. None of them

7. Deductive Research Method-------

A. Verify an observed event

B. Analyze an observed event

C. Correlate an observed event

D. None of them

8. Research objective may be linked with a ----------

A. Formulae

B. Pictures

C. Hypothesis

D. None of them

9. ---------- can be general or specific.

A. Objectives

B. Precautions

C. Approaches

D. None of them

10. --------- can explore potential careers.

A. Statistics

B. Research

C. Variable

D. None of them

11. ---------- is one of the most critical aspects of research.

A. Accuracy

B. Assimilation

C. Accommodation

D. None of them

12. ---------- research focuses on expanding knowledge on current issues through data collection.

A. Exploratory
B. Descriptive
C. Explanatory
D. None of them

13. Causal Research is also known as -------- research.

A. Exploratory
B. Descriptive
C. Explanatory
D. None of them

14. In -------- research, the responses are essentially non-numerical.

A. Qualitative
B. Quantitative
C. Correlational
D. None of them

15. ---------- research deals with numbers.

A. Qualitative
B. Quantitative
C. Case Study
D. None of them

Answers for Self Assessment

1T, 2F, 3T, 4T, 5T, 6B, 7A, 8C, 9A, 10B, 11A, 12B, 13B, 14A, 15C

Review Questions

1. Define Research. Explain its goals.
2. Explain the characteristics of Research.
3. Briefly discuss the conceptual use of Research.
4. What are the precautions of doing Research?
5. What are the benefits of Research?
6. What are the different types of Approaches to Research?
7. What are the objectives of Research?
8. Narrate the purposes of Research.
9. What do you mean by pure Scientific research?
10. What do you mean by Applied Scientific research?

Further Readings

- The Practice of Psychological Research by Earl, R. Babbie-13th ed. Wadsworth Publishing Co.inc.2011

- Methods of Psychological Research by Paul,K. Hatt& William, J. Goode. Surjeet Publication. 2018.

Unit 04 :Types of Psychological Research

Contents

Objectives

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- know about different types of Research
- familiarize with the research Process.

Introduction

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- To find out the real facts
- To achieve the new thoughts
- To evaluate the information
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In general, research objectives describe what we expect to achieve by a project.

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Areas of Research

The most important fields of research, among others, are;

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- Accuracy is one of the most critical aspects of research. The information must be accurate and correct. laboratories provide a controlled environment to collect data. Accuracy is measured in the instruments used, the calibrations of instruments or tools, and the experiment's result.

4.1. Experimental Research

Experimental research is a study that strictly adheres to a scientific research design. It includes a hypothesis, a variable that can be manipulated by the researcher, and variables that can be measured, calculated and compared. Most importantly, experimental research is completed in a controlled environment. The researcher collects data and results will either support or reject the hypothesis. This method of research is referred to a hypothesis testing or a deductive research method.

Experimental research seeks to determine a relationship between two (2) variables—the dependent variable and the independent variable. After completing an experimental research study, a correlation between a specific aspect of an entity and the variable being studied is either supported or rejected.

Data in experimental research must be able to be quantified, or measured. Data collected could be acidity/alkalinity, area, circumference, density, electrical current/potential/resistance, force, growth (time, weight, volume, length/width), heat, humidity, light intensity, mass, pressure, sound intensity, temperature, time, velocity, volume or weight. However, the entity should be carefully observed qualitatively, or described using words and photographs. How does the entity look, smell, sound, feel, and taste (when appropriate)? These types of observations help supplement the measurements taken throughout the experiment.

4.2. Correlational Research

Correlation coefficient is used to measure the strength of the relationship between two variables. It is a statistical measure. There are several types of correlation coefficients, the most popular being Pearson's correlation coefficient. A correlation coefficient ranges from -1 to +1. A correlation coefficient of +1 indicates a perfect positive correlation whereas a correlation coefficient of -1 indicates a perfect negative correlation between two variables. A correlation coefficient of 0 indicates that there is no relationship between the variables under study.

For instance, let us consider a hypothetical study on hypertension and marital satisfaction. A researcher is aiming to study the relationship between disease (hypertension) and marital satisfaction. If the researcher finds a negative correlation between these two variables indicating that as marital satisfaction increases, experiences of hypertension decreases. However, this does not mean that marital dissatisfaction is causing hypertension, it just highlights an association between them. In correlational research, none of the variables under study are manipulated or changed. They are just measured and the associations between them are observed or examined.

Positive correlation: A positive correlation indicates that there is a positive relationship between the two variables. In this kind of relation, as one variable increases, the other variable also increases. For instance, the number of cars a person owns is positively correlated with their income. More the income, more the number of cars.

Negative correlation: A negative correlation indicates that there is a negative relationship between the two variables. In this kind of correlation, as one variable increases, the other variable decreases. For example, there is a negative relationship between levels of stress and life satisfaction. This indicates that as stress levels increase, life satisfaction decreases.

Zero correlation: Zero correlation indicates that there is no relationship between the two variables. A change in one variable does not lead to any changes in the other variable. An example of zero correlation is the relationship between intelligence and height. An increase in height does not lead to any changes in the intelligence of an individual.

4.3. Case Study Research

A case study is a research approach that is used to generate an in-depth, multi-faceted understanding of a complex issue in its real-life context. It is an established research design that is used extensively in a wide variety of disciplines, particularly in the social sciences.

When to do a case study

A case study is an appropriate research design when you want to gain concrete, contextual, in-depth knowledge about a specific real-world subject. It allows you to explore the key characteristics, meanings, and implications of the case.

Case studies are often a good choice in a thesis or dissertation. They keep your project focused and manageable when you don't have the time or resources to do large-scale research.

You might use just one complex case study where you explore a single subject in depth, or conduct multiple case studies to compare and illuminate different aspects of your research problem.

4.4. Observational Research

Observation research is a qualitative research technique where researchers observe participants' ongoing behavior in a natural situation. ... The purpose of this type of research is to gather more reliable insights. In other words, researchers can capture data on what participants do as oppose to what they say they do.

Observational research allows the researcher to see what their subjects really do when confronted with various choices or situations.

The term refers to the study of non-experimental situations in which behavior is observed and recorded. It could also be termed, "what's going on or what's she doing." The research is classified

as non-experimental because the variables are neither controlled nor manipulated. The results are both qualitative and quantitative in nature.

4.5. Quasi-Experimental Research

Like a true experiment, a quasi-experimental design aims to establish a cause-and-effect relationship between an independent and dependent variable.

However, unlike a true experiment, a quasi-experiment does not rely on random assignment. Instead, subjects are assigned to groups based on non-random criteria.

Quasi-experimental design is a useful tool in situations where true experiments cannot be used for ethical or practical reasons.

When to use quasi-experimental design

Although true experiments have higher internal validity, you might choose to use a quasi-experimental design for ethical or practical reasons.

Ethical

Sometimes it would be unethical to provide or withhold a treatment on a random basis, so a true experiment is not feasible. In this case, a quasi-experiment can allow you to study the same causal relationship without the ethical issues.

The Oregon Health Study is a good example. It would be unethical to randomly provide some people with health insurance but purposely prevent others from receiving it solely for the purposes of research.

However, since the Oregon government faced financial constraints and decided to provide health insurance via lottery, studying this event after the fact is a much more ethical approach to studying the same problem.

Practical

True experimental design may be infeasible to implement or simply too expensive, particularly for researchers without access to large funding streams.

At other times, too much work is involved in recruiting and properly designing an experimental intervention for an adequate number of subjects to justify a true experiment.

In either case, quasi-experimental designs allow you to study the question by taking advantage of data that has previously been paid for or collected by others (often the government).

4.6. Survey Research

A survey is a data collection tool used to gather information about individuals. Surveys are commonly used in psychology research to collect self-report data from study participants. A survey may focus on factual information about individuals, or it might aim to obtain the opinions of the survey takers.

A survey can be used to investigate the characteristics, behaviors, or opinions of a group of people. These research tools can be used to ask questions about demographic information about characteristics such as sex, religion, ethnicity, and income.

They can also collect information on experiences, opinions, and even hypothetical scenarios. For example, researchers might present people with a possible scenario and then ask them how they might respond in that situation.

Advantages of Survey Research

One of the big benefits of using surveys in psychological research is that they allow researchers to gather a large quantity of data relatively quickly and cheaply. A survey can be administered as a structured interview or as a self-report measure, and data can be collected in person, over the phone, or on a computer.

- Surveys allow researchers to collect a large amount of data in a relatively short period.
- Surveys are less expensive than many other data collection techniques.

- Surveys can be created quickly and administered easily.
- Surveys can be used to collect information on a broad range of things, including personal facts, attitudes, past behaviors, and opinions.

Disadvantages of Survey Research

One potential problem with written surveys is the nonresponse bias. Experts suggest that return rates of 85 percent or higher are considered excellent, but anything below 60 percent might have a severe impact on the representativeness of the sample.5

Poor survey construction and administration can undermine otherwise well-designed studies.

The answer choices provided in a survey may not be an accurate reflection of how the participants actually feel.

While random sampling is generally used to select participants, response rates can bias the results of a survey.

The social desirability bias6 can lead people to respond in a way that makes them look better than they really are. For example, a respondent might report that they engage in more healthy behaviors than they do in real life.

Summary

- Research is the organized and systematic method of finding answers to questions.
- It is systematic because it is a process broken up into clear steps that lead to conclusions.
- Research is organized because there is a planned structure or method used to reach the conclusion.
- Research is only successful if we find answers, whether we like these answers or not.
- Development research is focused on relevant, useful and important questions. If there are no questions, there can be no research.

Research is the organized and systematic method of finding answers to questions. It is systematic because it is a process broken up into clear steps that lead to conclusions. Research is organized because there is a planned structure or method used to reach the conclusion.

Research is only successful if we find answers, whether we like these answers or not. Development research is focused on relevant, useful and important questions. If there are no questions, there can be no research.

Keywords

Philosophical roots, objectives, goals, purpose, characteristics, conceptual use, importance, approaches, types, precautions.

Self Assessment

1. Research is a process of systematic enquiry.

A. True

B. False

2. There are seven objectives in a Research.

A. True

B. False

3. There are four goals of Research.

A. True

B. False

4. The research is considered relevant if the findings will be required by the policy makers or scientists.

A. True

B. False

5. Research is ethical when it promotes trust.

A. True

B. False

6. Inductive Research method----------

A. Verify an observed event

B. Analyze an observed event

C. Correlate an observed event

D. None of them

7. Deductive Research Method-------

A. Verify an observed event

B. Analyze an observed event

C. Correlate an observed event

D. None of them

8. Research objective may be linked with a ----------

A. Formulae

B. Pictures

C. Hypothesis

D. None of them

9. ---------- can be general or specific.

A. Objectives

B. Precautions

C. Approaches

D. None of them

10. ---------- can explore potential careers.

A. Statistics

B. Research

C. Variable

D. None of them

11. ---------- is one of the most critical aspects of research.

A. Accuracy

B. Assimilation

C. Accommodation

D. None of them

12. ---------- research focuses on expanding knowledge on current issues through data collection.

A. Exploratory

B. Descriptive
C. Explanatory
D. None of them

13. Causal Research is also known as -------- research.
A. Exploratory
B. Descriptive
C. Explanatory
D. None of them

14. In -------- research, the responses are essentially non-numerical.
A. Qualitative
B. Quantitative
C. Correlational
D. None of them

15. ---------- research deals with numbers.
A. Qualitative
B. Quantitative
C. Case Study
D. None of them

Answers for Self Assessment

1T, 2F, 3T, 4T, 5T, 6B, 7A, 8C, 9A, 10B, 11A, 12B, 13B, 14A, 15C

Review Questions

1. Define Research. Explain its goals.
2. Explain the characteristics of Research.
3. Briefly discuss the conceptual use of Research.
4. What are the precautions of doing Research?
5. What are the benefits of Research?
6. What are the different types of Approaches to Research?
7. What are the objectives of Research?
8. Narrate the purposes of Research.
9. What do you mean by pure Scientific research?
10. What do you mean by Applied Scientific research?

Further Readings

- The Practice of Psychological Research by Earl, R. Babbie-13th ed. Wadsworth Publishing Co.inc.2011
- Methods of Psychological Research by Paul,K. Hatt& William, J. Goode. Surjeet Publication. 2018.

Unit5: Research designs:

Contents

Objectives

This unit will enable you to:

Know different types of research designs;

Understand difference between experimental and non-experimental research;

Understand how longitudinal design works

Introduction

Research design is the research process that comes after defining the research problem. Research design is a blueprint for doing research. It can guide us on which kind of design is suitable for our study. It refers to the framework of any research person's research methods and techniques. It allows researchers to utilize the appropriate methods for research and set up their studies successfully in the future. The research design topic explained the types of research such as experimental, survey research, correlational, semi-experimental, review and subtype of research such as experimental design, research problem, descriptive case study.

There are three main types of research design following:

Data collection,

Measurement

Analysis

Good research usually confirms minimum bias levels in the data collection method to improve internal and external research validity.

In fact, the research design is the conceptual structure within which research is conducted; it constitutes the blueprint for the collection, measurement and analysis of data. The design includes an outline of what the researcher will do, from writing the hypothesis and its operational implications to the final data analysis.

More explicitly, the design decisions happen to be in respect of:

(i) What is the study about?
(ii) Why is the study being made?
(iii) Where will the study be carried out?
(iv) What type of data is required?
(v) Where can the required data be found?
(vi) What periods will the study include?
(vii) What will be the sample design?
(viii) What techniques of data collection will be used?
(ix) How will the data be analyzed?
(x) In what style will the report be prepared?

Need for research design:

It stands for effective and advanced planning of the methods to be adopted for collecting ethical and relevant data and the techniques to be used in their analysis keeping in view the objective of the research and the availability of staff, time and money.

Features of a Good Design

1. Flexible
2. Appropriate,
3. Efficient,
4. Economical
5. Which minimizes bias and maximizes the reliability of the data collection and analysis.

A research design appropriate for a particular research problem usually involves the consideration of the following factors:

(i) the means of obtaining information;
(ii) The availability and skills of the researcher and his staff, if any;
(iii) The objective of the problem to be studied;
(iv) The nature of the problem to be studied; and
(v) The availability of time and money for the research work.

14.1. Experimental design

It is concerned with the skillful interrogation in nature. It is a plan for assigning participants to experimental conditions and statistical analysis associated with the plan. Three basic principles of experimental designs have been listed by Professor Fisher: (1) the Principle of Replication; (2) the Principle of Randomization; and the (3) Principle of Local Control.

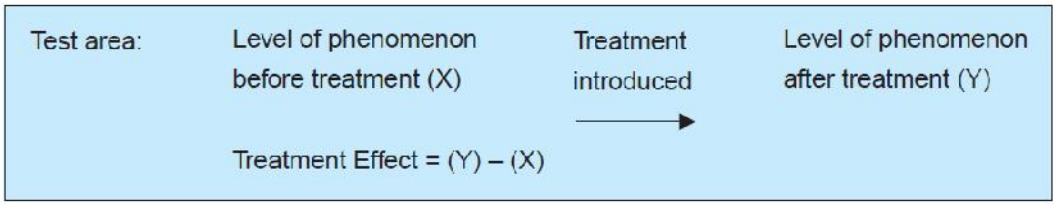
1. Principle of replication- while doing research, the experiment should be repeated several times. As a result, each treatment is used in multiple experimental units rather than just one. The statistical accuracy of the experiments is improved as a result. Randomization allows the later use of probability theory and gives a solid foundation for statistical analysis.

2. Principle of Randomization- the probability of getting an equal chance of selection. We can control the effects of the extraneous factors.

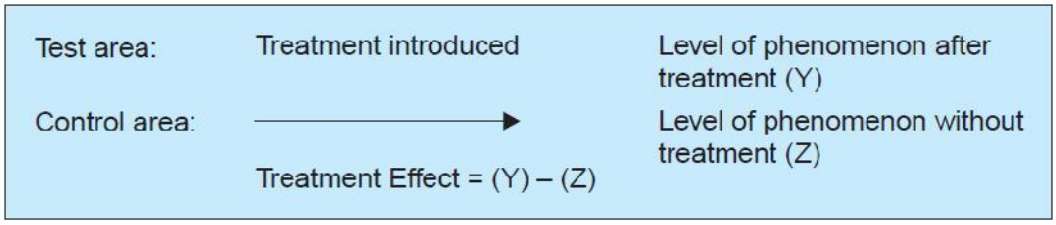
3. Principle of Local Control- it will help eliminate the variability due to extraneous factors from the experimental error.

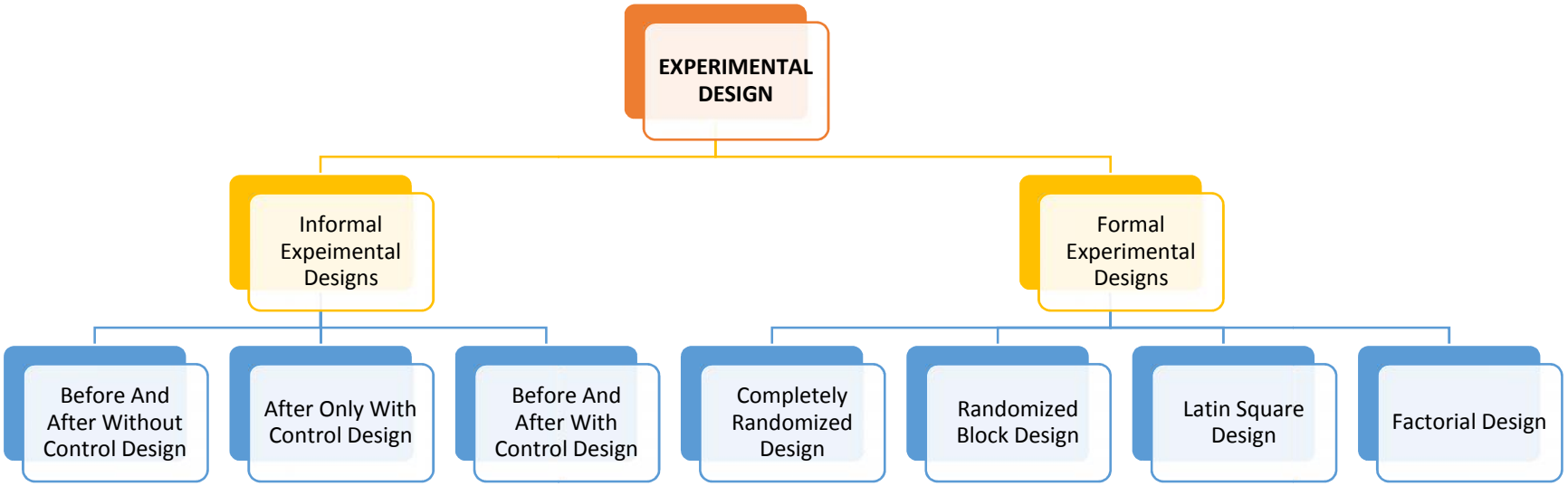
The experimental research design refers to the framework or structure of an experiment. Further, it categorizes into 2 broad categories:

Before-and-after without control design: In this design, a single test group hasSelected and the dependent variable is measured before the introduction of the treatment. The treatment has beenintroduced, and the dependent variable is measured again after the treatment has beenintroduced. The treatment effect would be equal to the level of the phenomenon after thetreatment, minus the level of the phenomenon before the treatment. The design can be represented thus:



After-only with control design: In this design, two groups or areas (test area and control area) are selected, and the treatment is introduced into the test area only. The dependent variable is then measured in both areas at the same time. Treatment impact is assessed by subtracting the value of the dependent variable in the control area from its importance in the test area. This can be exhibited in the following form:



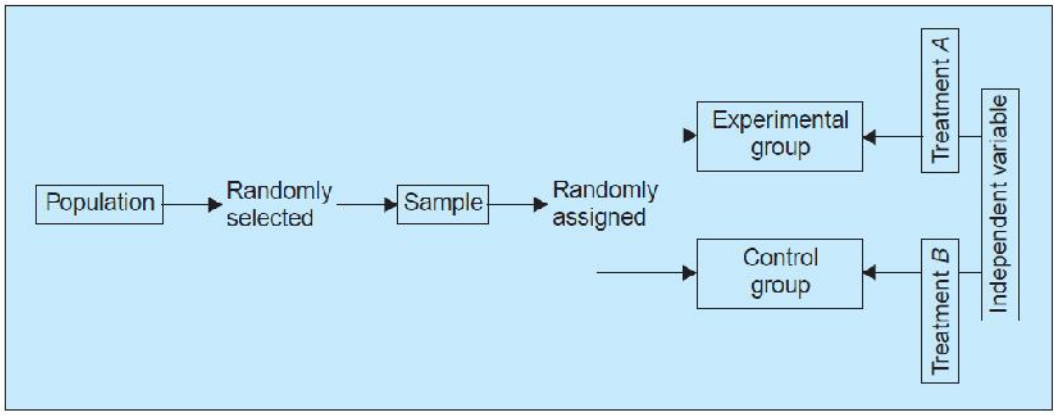

EXPERIMENTAL DESIGN
Informal Expeimental Designs
Formal Experimental Designs
Before And After Without Control Design
After Only With Control Design
Before And After With Control Design
Completely Randomized Design
Randomized Block Design
Latin Square Design
Factorial Design

Before-and-after with control design: In this design two areas are selected and the dependent variable is measured in both the areas for an identical time-period before the treatment. The treatment is then introduced into the test area only, and the dependent variable is measured in both for an identical time-period after the introduction of the treatment. The treatment effect is determined by subtracting the change in the dependent variable in the control area from the change in the dependent variable in test area. This design can be shown in this way:

	Time Period I		Time Period II
Test area:	Level of phenomenon before treatment (X)	Treatment introduced →	Level of phenomenon after treatment (Y)
Control area:	Level of phenomenon without treatment (A)		Level of phenomenon without treatment (Z)

Treatment Effect = (Y – X) – (Z – A)

Completely randomized design (C.R. design): Involves only two principles viz., the principleof replication and the principle of randomization of experimental designs. It is the simplest possible design and its procedure of analysis is also easier. The essential characteristic of the design is that subjects are randomly assigned to experimental treatments (or vice-versa). For instance, if we have 10 subjects and if we wish to test 5 under treatment A and 5 under treatment B, the randomization process gives every possible group of 5 subjects selected from a set of 10 an equal opportunity of being assigned to treatment A and treatment B. One-way analysis of variance (or one-way ANOVA) * is used to analyze such a design. Even unequal replications can also work in this design. It provides maximum number of degrees of freedom to the error. Such a design is generally used when experimental areas happen to be homogeneous.



Randomized block design (R.B. design)- In the Randomized Block design, subjects are first divided into groups, known as blocks, such that withineach group the subjects are relatively homogeneous in respect to some selected variable. The variableselected for grouping the subjects is one that is believed to be related to the measures to be obtainedin respect of the dependent variable. The number of subjects in a given block would be equal to thenumber of treatments and one subject in each block would be randomly assigned to each treatment.

Blocks are the levels at which we hold the extraneous factor fixed, so that its contributionto the total variability of data can be measured. The main feature of the R.B. design is that in thiseach treatment appears the same number of times in each block. The R.B. design is analysed by thetwo-way analysis of variance (two-way ANOVA) * technique.

Latin square design (L.S. design) is an experimental design very frequently used in agricultural research. The conditions under which agricultural investigations are carried out are different from those in other studies for nature plays an important role in agriculture.

Factorial designs: Factorial designs are used in experiments where the effects of varying more than one factor is to be determined. They are especially important in several economic and social phenomena where usually a large number of factors affect a particular problem. Factorial designs can be of two types: (i) simple factorial designs and (ii) complex factorial designs.

Nonexperimental research design-this research design has lacks of the independent variable and manipulation of the independent variable. This is used to measure variables as they occur naturally in the lab or real world. There is huge distinction between experimental research design and nonexperimental research design.Experimental research can provide strong evidence that changes in an independent variable cause differences in a dependent variable, nonexperimental research generally cannot.

When to use nonexperimental research design

1. When research question and hypothesis can be about single variable.
2. When, there is non-causal statistical relationship between variable.
3. The research question can be about a causal relationship, but the independent variable cannot be manipulated or participants cannot be randomly assigned to conditions or orders of conditions (e.g., Does damage to a person's hippocampus impair the formation of long-term memory traces?).
4. The research question can be broad and exploratory, or it can be about what it is like to have a particular experience (e.g., What is it like to be a working mother diagnosed with depression?).

Type of research design

1. Single-variable research design
2. Correlational research design (measure statistical relationship between two variables but does not include the manipulation of an independent variable.
3. Quasi- experimental research design

14.2. Between and within group design:

This is the part of experimental design in which between group design emphasize that we use it when a different group of subjects is assigned to each level of independent variable. Further, it divided into two-partrandomization and matched group.

1. Randomized group: randomly assign subjects to each level of independent variable. Number of groups in experiment should have equal the number of levels of independent variable.

Advantages:

- Simple to carry out only small groups of subjects needed.
- No pre-testing or categorization of subjects is needed.
- The statistical analysis is straight-forward.

Disadvantages:

- It could provide only limited information on the effect of the IV on the DV, if there are only 2 or 3 levels of the IV.
- It may not be sensitive to the effect of the IV, because subjects may vary wildly on other characteristics that influence the DV. This makes it difficult to test the influence of the IV on the DV.

2. Matched group: When the subjects are matched by a set of characteristics that may influence the DV and distributed evenly across each level of the IV. It attempts to control for subject characteristics that influence the DV. Thus, it may be more likely that the influence of the IV on the DV will be observed.

Advantages:

- Allows us to control for nuisance variables that may otherwise obscure the effect of the IV on the DV.

Disadvantages:

- It requires pre-testing and matching of subjects.
- Critical that the measures us use to match subjects are reliable and valid.

Within group designs:

This is an alternative to the between-subjects design, each subject or group is exposed to all levels of the IV, rather than being assigned to just one level.

Advantages:

- Subjects are "matched" across all levels of the IV.
- This design controls the error variance due to extraneous variables for example-controls for subject characteristics that influence the DV.

Disadvantages:

- More demanding on subjects such as time and resources
- Carryover effects- when one treatment effects the results of a future treatment. (Example of carryout effect such as learning and fatigue-subject gets tired or bored; habituation, sensitization, etc.)

14.3. Longitudinal research design

Itis observational study, so researchers are not allowed to interfere with their subjects. In this study, researchers are conducted several observations of the same subject or the participants over a period of time, sometimes lasting many years.

Most of the longitudinal studies examine associations between exposure to known or suspected causes of disease and subsequent morbidity or mortality.

Advantages

- The ability to identify and relate events to particular exposures, and to further define these exposures with regards to presence, timing chronicity.
- Establishing sequence of events.
- Following change over time in particular individuals within the cohort.
- Ability to correct for the "cohort effect" – that is allowing for analysis of the individual time components of cohort (range of the birth dates), period (current time), and age (at point of measurement)- and to account for the impact of each individually.

Disadvantages:

- Incomplete and interrupted follow-up of individuals, in view of the potentiation of one by the other:
- The potential for inaccuracy in conclusionif adopting statistical techniques that fail to account for the intra-individual correlation of measure,
- Increased financial demands associated with this approach.

5.4. Cross sectional study

It is based on observation. Researcher supposed to record information about their subjects without having any manipulating the study environment. We would simply measure the blood pressure level of daily exercise doer and non- exercise doer along with any other characteristics that might be of interest to us.

Advantages:

- It allows researcher to compare many different variables at the same time. (Ex.-look at age, gender, income and educational level in relation to do exercise and blood pressure levels.)

Disadvantages:

- It may not providefactual information about cause-and-effect relationships.
- It only providesa snapshot of a single moment in time.

5.5. Correlational research design

This research design measures the relationship between two or more variables. Variable may be presented on a scatter plot to visually show the relationship or association. The Pearson correlation coefficient ® is a measure of the strength of linear relationship between two variables.

Correlation can be strong or weak and positive or negative and sometime, there is no correlation. Numerical value called the correlation coefficient.

Positive correlations: both the variable increase or decrease at the same time. It close to +1.00 indicates a strong positive correlation.

Negative correlations: it shows that amount of one variable will increase then another variable will decrease. And it is close to -1.00 indicates a strong negative correlation.

No correlation: there is no correlation or relationship between the two variables. It indicates by 0.

5.8. Self-assessments

1. What are the features of a Good Design?
    a. Flexible
    b. Appropriate
    c. Efficient
    d. All of the above
2. Research design is a _____for doing research.
    a. Blueprint
    b. Schemas
    c. Cognitive map
    d. None of the above
3. Which design is analysed by the two-way analysis of variance (two-way ANOVA) technique?
    a. Within group
    b. Randomize block design
    c. Longitudinal research design
    d. None of the above
4. Which type of research design is based on observational study and researcher are not allowed to interfere with their subjects?

a. Within group
b. Randomize block design
c. Longitudinal research design
d. Cross-cultural research design

5. In which research design, researchers are supposed to record information about their subjects without having any manipulating the study environment?
   a. Within group
   b. Randomize block design
   c. Longitudinal research design
   d. Cross-cultural research design
6. What do we callcorrelation-coefficient?
   a. Alphabetical values
   b. Numerical values
   c. Social values
   d. Cultural values
7. Which one is not correct advantages of longitudinal research design?
   a. The ability to identify and relate events to particular exposures, and to further define these exposures with regards to presence, timing chronicity
   b. Establishing sequence of events:
   c. Following change over time in particular individuals within the cohort
   d. Subjects are "matched" across all levels of the IV.
8. The amount of one variable will increase then another variable will decrease, have shown that_____.
   a. Negative correlation
   b. Positive correlation
   c. Double correlation
   d. Zero correlation
9. How would you indicate, If there is no correlation or relationship between the two variables?
   a. +1
   b. -1
   c. 0
   d. .81
10. Which are the types of formal experimental design except one?
    a. Latin square
    b. Randomized Block design
    c. Between group design
    d. Factorial design

Answer key

1	2	3	4	5	6	7	8	9	10
d	a	b	c	d	b	d	a	c	c

5.9. Review Questions

1. What do you mean by research design?
2. Characteristics of research design?
3. Briefly explain experimental design?
4. Explain the differences between cross-cultural research design and longitudinal research design?
5. What is correlational design?

Unit 06:Reliability

Contents

Objectives

After the completion of this Unit, the students will be able to:

- understand the concept of Sampling
- know different components of Reliability and Validity
- familiarize with the use of Sampling, Reliability and Validity in Social Research

Introduction

A sample is defined as a smaller set of data that a researcher chooses or selects from a larger population by using a predefined selection method. These elements are known as sample points, sampling units, or observations.

Creating a sample is an efficient method of conducting research. In most cases, it is impossible or costly and time-consuming to research the whole population. Hence, examining the sample provides insights that the researcher can apply to the entire population.

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

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 behaviors 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.

we can now define reliability more precisely. Reliability is a ratio or fraction. In layperson terms we might define this ratio as:

true level on the measure

You might think of reliability as the proportion of "truth" in your measure. Now, we don't speak of the reliability of a measure for an individual – reliability is a characteristic of a measure that's taken across individuals. So, to get closer to a more formal definition, let's restate the definition above in terms of a set of observations. The easiest way to do this is to speak of the variance of the scores. Remember that the variance is a measure of the spread or distribution of a set of scores. So, we can now state the definition as:

We might put this into slightly more technical terms by using the abbreviated name for the variance and our variable names:

We're getting to the critical part now. If you look at the equation above, you should recognize that we can easily determine or calculate the bottom part of the reliability ratio – it's just the variance of the set of scores we observed (You remember how to calculate the variance, don't you? It's just the sum of the squared deviations of the scores from their mean, divided by the number of scores). But how do we calculate the variance of the true scores. We can't see the true scores (we only see X)! Only God knows the true score for a specific observation. And, if we can't calculate the variance of the true scores, we can't compute our ratio, which means we can't compute reliability! Everybody got that? The bottom line is… we can't compute reliability because we can't calculate the variance of the true scores.

Great. So where does that leave us? If we can't compute reliability, perhaps the best we can do is to estimate it. Maybe we can get an estimate of the variability of the true scores. How do we do that? Remember our two observations, X1 and X2? We assume (using true score theory) that these two observations would be related to each other to the degree that they share true scores. So, let's calculate the correlation between X1 and X2. Here's a simple formula for the correlation:

where the Sd stands for the standard deviation (which is the square root of the variance). If we look carefully at this equation, we can see that the covariance, which simply measures the "shared" variance between measures must be an indicator of the variability of the true scores because the true scores in X1 and X2 are the only thing the two observations share! So, the top part is essentially an estimate of var(T) in this context. And, since the bottom part of the equation multiplies the standard deviation of one observation with the standard deviation of the same measure at another time, we would expect that these two values would be the same (it is the same measure we're taking) and that this is essentially the same thing as squaring the standard deviation for either observation. But, the square of the standard deviation is the same thing as the variance of the measure. So, the bottom part of the equation becomes the variance of the measure (or var(X)). If you read this paragraph carefully, you should see that the correlation between two observations of the same measure is an estimate of reliability.

It's time to reach some conclusions. We know from this discussion that we cannot calculate reliability because we cannot measure the true score component of an observation. But we also know that we can estimate the true score component as the covariance between two observations of the same measure. With that in mind, we can estimate the reliability as the correlation between two

observations of the same measure. It turns out that there are several ways we can estimate this reliability correlation. These are discussed in Types of Reliability.

There's only one other issue I want to address here. How big is an estimate of reliability? To figure this out, let's go back to the equation given earlier:

6.1. Meaning of Reliability

Reliability is that property of a measuring device for social phenomena (particularly in the quantitative methods) which yields consistent measurements when the phenomena are stable, regardless of who uses it, provided the basic conditions remain the same.

Characteristics of Reliability

Stability Characteristic

- variations in Powerfulness, i.e., variations in capacity or responsiveness.
- variations in Efficiency, i.e., variations in resource usage.
- It produces measurements about a tested system's ability to deliver its services with constant performance figures over time.
- It usually runs for long periods at high load to produce significant results.

Availability Characteristics

- probability of service delivery such as acceptable number of failed services per million service requests or equivalent.
- availability time or up-time of a system, hardware and software, such as 99.999% of scheduled production time.
- availability measurements usually run for very long periods of time at high load rates to produce significant results.
- availability measurements can be combined with stability measurements.

Robustness Characteristics

- There are two types of extreme conditions tested:
- external conditions
- internal conditions
- Robustness measurements can be combinations of external and internal conditions.
- variations in Powerfulness.
- variations in Efficiency.

Recovery Characteristics

- Recovery characteristics are measurements of time to perform recovery and maintain service levels during recovery procedures.
- There are two types of simulated recovery situations:
- system outages.
- service outages.
- recovery time from various types of outages.
- powerfulness during various types of outages.

Accuracy Characteristics

- Accuracy characteristics are measurements of correctness in service delivery especially under heavy load or extreme conditions.
- The objectives are to identify and eliminate wrong delivery or incorrect results.

Components of Reliability

- Reliability refers to the dependability or consistency or stability of the test scores. It does not go beyond it.
- Reliability is concerned with the stability of test scores-self correlation of the test.
- Every reliable test is not necessarily valid. A test having high correlation with itself may not have equally high correlation with a criterion.
- Reliability is a prerequisite of validity. A highly reliable test is always a valid measure of some functions. Thus, reliability controls validity.
- Reliability may be said as the dependability of measurement.
- Maximum reliability is found in case of homogeneous items.
- Maximum reliability requires items of equal difficulty and high inter- correlation among test items.
- Validity coefficient does not exceed the square root of reliability coefficient.
- The Reliability Is the Proportion of True Variance and Error Variance.
- We Cannot Claim That a Reliable Test Is Also Valid. This May or May Not Be True. A Test Measures Consistency, But It May Not Measure What It Intends to Measure. For Example, When A Man Wrongly Reports His Date Of Birth Consistently, It May Be Reliable But Not Valid.

Reliability is the consistency of results of a test whenever the latter is repeated on the same sample or individual under identical conditions. Reliability of a test is indicated by the close similarity or identity of test scores when the same test is repeated or when an equivalent form of test is administered. Reliability indicates the dependability of a test used in guidance, prediction.

Reliability coefficient is not free from errors of measurement, but ranges from -1 to +1 and its magnitude depends on the type and objectives of the test as also the nature of the group tested.

Methods of Estimating Reliability

There are four procedures employed for determining the reliability of a test. These are-

6.2. Test -Retest Method-

Repetition of a test is the simplest method of determining an agreement between two sets of scores; the test is given and repeated on the same group of individuals and the correlation computed between the first and second set of scores. A reliability estimate based on two successive administrations of the same test is appropriate only if two assumptions are made: a) that person does not change their related true positions on the characteristics continuum from the first to the second testing, and b) that a person's experience in taking the test does not result in the test becoming for him on the second administration of different test.

Thus, in spite of the fact that the test-retest is sometimes the only available procedure, the method is open to several serious objections. If the test is repeated immediately, many subjects will recall their first answers and that will undoubtedly tend to increase their scores and sometimes by a great deal.

Alternate or Parallel Form

One way of avoiding the difficulties encountered in test-retest is through the use of alternate forms of the test. The same person can thus be tested with one form on the first occasion and with another comparable form on the second occasion. Thus, the alternate form of reliability estimate is based on the comparison of two sets of scores for the same persons but is obtained by the administration of two equivalent forms of the same test. Such a reliability is a measure of both temporal stability and consistency of response in different item samples.

The alternate form method is satisfactory when sufficient time has intervened between administration of the two forms to weaken or eliminate memory of practice effect. When the second form of a test follows the first closely, scoring on the second form of test will often increase because of familiarity. If such increments are appropriately constant the reliability coefficient of the test will not be affected.

Split-Half Method

Instead of making up alternate forms, a compromised procedure has been developed to obtain 'part-scores' for different sections within the same test. The most popular of such procedures is the split-half method. In this method, the test is broken into two equivalent parts and correlation of these half tests is compared. From the half test correlation, the self-correlation of the whole test is estimated. Spearman-Brown Formula is used for the split-half method.

Advantages

The split-half method is employed when it is not possible to construct an alternate form of the test. Its main advantage is that all of the data are obtained upon one occasion, hence variation introduced by differences between the two testing situations are eliminated. This method is regarded by many as the best method for measuring test reliability.

Disadvantages

A marked disadvantage of the split-half method lies in the fact that chance errors on the two halves of the test are in the same way, thus tending to make the reliability coefficient too high. The longer the test, the less the probability that the effect of temporary and variable disturbances will be cumulative in one direction, and the more accurate the estimate of score reliability. Another objection is that a test can be divided into two parts in a number of ways, so that the reliability obtained by this method is not a unique value.

Method of Rational Equivalence

Like the previous method, it also depends on item statistics. They were developed because of dissatisfaction with the split-half method in a great way and each split might yield a somewhat different estimate of reliability.

It is based on the Kuder-Richardson formula. If the inter-correlations are equal, the items measure the same trait or traits; there is a functional homogeneity.

Reliability in Qualitative Research

Definition

Reliability pertained to the extent to which the study is replicable & how accurate the research methods and the techniques used to produce data.

Reliability in qualitative research refers to the stability of responses to multiple coders of data sets. It can be enhanced by detailed field notes by using recording devices and by transcribing the digital files.

Nature of Reliability in Qualitative Research

- Dependability- Dependability refers to the consistency and reliability of the research findings and the degree to which research procedures are documented.

- Confirmability- To achieve confirmability, researchers must demonstrate that the results are clearly linked to the conclusions in a way that can be followed and, as a process, replicated.
- A good qualitative study can help us "understand a situation that would otherwise be enigmatic or confusing" (Eisner, 1991, p. 58). This relates to the concept of a good quality research when reliability is a concept to evaluate quality in quantitative study with a "purpose of explaining" while quality concept in qualitative study has the purpose of "generating understanding" (Stenbacka, 2001, p. 551).

Qualitative v/s Quantitative Research

Quantitative Research	Qualitative Research
Internal Validity	Credibility
External Validity	Transferability
Reliability	Dependability
Objectivity	Conformity

Application of Reliability in Qualitative Research

Quantitative Research Qualitative Research

Reliability is the consistency of the analytical procedure for personal & research method biases that may have influenced the findings Reliability relates to the "trustworthiness" by which the methods have been undertaken, an independent researcher should be able to arrive at similar or comparable findings.

Neutrality (Confirmability)- the findings are linked with the researcher's philosophical position and perspectives.

QUALITY VS. RELIABILITY

Reliability has sometimes been classified as "how quality changes over time." The difference between quality and reliability is that quality shows how well an object performs its proper function, while reliability shows how well this object maintains its original level of quality over time, through various conditions.

For example, a quality vehicle that is safe, fuel efficient, and easy to operate may be considered high quality. If this car continues to meet this criterion for several years, and performs well and remains safe even when driven in inclement weather, it may be considered reliable.

Asking a few key questions can help one determine the difference between both quality and reliability:

Quality = Does the object perform its intended function? If so, how well does it perform its intended function?

Reliability = To what level has said object maintained this level of quality over time?

Conclusion

Reliability in qualitative research is very important to understand because we do not have any measurable statistical yardstick for that. The success of qualitative research is solely depending on the explorative capacity of the researcher and also it is important to the depth analysis of the topic which gives internal consistency of the research.

Reliability is the consistency in measurement. It gives the same result every time on the respondent in an instrument to measure a variable. This makes reliability very important for both Social and Physical Sciences.

Summary

Sampling is a process used in statistical analysis in which a predetermined number of observations are taken from a larger population. The methodology used to sample from a larger population depends on the type of analysis being performed, but it may include simple random sampling or systematic sampling.

In statistics and psychometrics, reliability is the overall consistency of a measure. A measure is said to have a high reliability if it produces similar results under consistent conditions:

hat is reliability? We hear the term used a lot in research contexts, but what does it really mean? If you think about how we use the word "reliable" in everyday language, you might get a hint. For instance, we often speak about a machine as reliable: "I have a reliable car." Or, news people talk about a "usually reliable source". In both cases, the word reliable usually means "dependable" or "trustworthy." In research, the term "reliable" also means dependable in a general sense, but that's not a precise enough definition. What does it mean to have a dependable measure or observation in a research context? The reason "dependable" is not a good enough description is that it can be confused too easily with the idea of a valid measure (see Measurement Validity). Certainly, when we speak of a dependable measure, we mean one that is both reliable and valid. So we have to be a little more precise when we try to define reliability.

In research, the term reliability means "repeatability" or "consistency". A measure is considered reliable if it would give us the same result over and over again (assuming that what we are measuring isn't changing!).

Let's explore in more detail what it means to say that a measure is "repeatable" or "consistent". We'll begin by defining a measure that we'll arbitrarily label X. It might be a person's score on a math achievement test or a measure of severity of illness. It is the value (numerical or otherwise) that we observe in our study. Now, to see how repeatable or consistent an observation is, we can measure it twice. We'll use subscripts to indicate the first and second observation of the same measure. If we assume that what we're measuring doesn't change between the time of our first and second observation, we can begin to understand how we get at reliability. While we observe a score for what we're measuring, we usually think of that score as consisting of two parts, the 'true' score or actual level for the person on that measure, and the 'error' in measuring it

Keywords

Sampling, Probability sampling, Simple random sampling, Cluster sampling, Systematic sampling, Stratified random sampling, Non-probability sampling, Convenience sampling, Purposive sampling, Snowball sampling, Quota sampling, Confidence interval, Reliability, Stability characteristics, Availability characteristics, Robustness characteristics, Recovery characteristics, Accuracy characteristics, Test-retest method, Alternate or parallel form method, Split-half method, Method of rational equivalence, Validity, Content validity, Construct validity, Concurrent validity, Predictive validity, Criterion- related validity.

SelfAssessment

1. A sample is a smaller set of data.

A. True

B. False

2. Sampling is of four types.

A. True

B. False

3. There are four methods of estimating reliability.

A. True

B. False

4. Sampling can reduce cost and time of research.

A. True

B. False

5. A valid test measures what it purports to measure.

A. True

B. False

6. Method of Rational Equivalence is based on----------

a. Kuder-Richardson Formula

b. Spearman- Brown Formula

c. Pearson product moment Formulae

d. None of these

7. In a multiple-choice test, guessing lowers the------.

a. Validity

b. Reliability

c. Predictability

d. None of these

8. Split-half method is based on---------

a. Validity

b. Reliability

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d. None of these

9. The concept of validity was formulated by--------

A. Pearson

B. Kelly

C. Mc. Namer

D. None of these

10. Which is not a common confidence interval?

a. 90%

b. 99%

c. 80%

d. None of these

11. When the researcher collects samples purely on the basis of his/her own discretion---------

a. Random sampling

b. purposive sampling

c. Quota sampling

d. None of these

12. All include in the characteristics of sampling except---------

a. Goal oriented

b. Imaginative

c. Proportional

d. None of these

13. The question of validity is raised in the context of ---------- points.

a. 2

b. 3

c. 4

d. 5

14. Characteristics of reliability include everything except-------

a. Stability

b. Novelty

c. Accuracy

d. None of these

15. In -------- sampling, each member has the same probability of being selected.

a. random

b. quota

c. Snowball

d. None of these

Answers for Self-Assessment

1T, 2F, 3T, 4T, 5T, 6 A, 7B, 8B, 9B, 10C, 11B, 12B,13B, 14B, 15A

Review Questions

1. Briefly describe different types of Sampling.
2. What are the different methods of estimating Reliability? Describe them.
3. What are the components of Reliability?
4. Narrate different methods of estimating Validity.
5. What is Sampling? How to determine a sample size?
6. What are the different types of Sampling?
7. What are the characteristics of Reliability?
8. What are the components and characteristics of Validity?
9. What are the characteristics of Sampling?
10. Define Sampling? What are the advantages of Sampling?

Further Readings

- Fundamentals of Statistics by S.C. Gupta. Himalaya Publishing House.2018
- Statistics for Psychology by R. GudmundIversen. W.C. Brown. 2016

Unit 7Validity

Contents

Objectives

After the completion of this Unit, the students will be able to:

- understand the concept of Validity
- know different components of Validity
- familiarize with the use of Validity in Psychological Research

Introduction

Validity is the extent to which a test measures what it claims to measure.1 It is vital for a test to be valid in order for the results to be accurately applied and interpreted.

Psychological assessment is an important part of both experimental research and clinical treatment. One of the greatest concerns when creating a psychological test is whether or not it actually measures what we think it is measuring.

For example, a test might be designed to measure a stable personality trait but instead, it measures transitory emotions generated by situational or environmental conditions. A valid test ensures that the results are an accurate reflection of the dimension undergoing assessment.

Validity isn't determined by a single statistic, but by a body of research that demonstrates the relationship between the test and the behavior it is intended to measure. There are four types of validity.

7.1 Validity

Meaning of Validity

- A test is said to be valid when it measures what it purports to measure.
- The concept of validity was formulated by Kelly (1927) who stated that a test is valid if it measures what it claims to measure.

if it measures what it claims to measure.

"A measurement procedure is valid insofar as it correlates with some measurement of success in the job which is being used as a predictor."- E.L. Thorndike

The question of Validity is raised in the context of three points: -

1. the form of the test
2. the purpose of the test
3. the population for whom it is intended

The test is valid when the performance which it measures corresponds to the same performance as otherwise independently measures or objectively defined. Validity is the most central concept in the whole testing enterprise. It is the main goal to which reliability and stability are aimed.

Components of Validity

- Validity is concerned with the extent to which the purpose of the test is being served.
- It studies how truthfully the test measures what it purports to measure.
- On the other hand, validity is the correlation of the test with some outside external criteria.
- A test to be valid, has to be reliable. A test which possesses poor reliability is not expected to yield high validity.
- To be valid a test must be reliable. Tests with low reliability cannot be highly valid.
- Validity may be said as correctness of measurement.
- If a test is heterogeneous, it has low reliability and high validity.
- The validity of a test may not be higher than the reliability index.
- On the other hand, maximum validity requires items differing in difficulty and low inter-correlation among items.
- Validity is the proportion of common factor variance.
- A valid test is always reliable. If a test truthfully measures what it purports to measure is both valid and reliable.

Different Approaches to find out Validity

The specific techniques employed in investigating the total relationship of scores are numerous and have been described by various names. The most common recommended procedures are-

7.2. Face Validity

Face validity is one of the most basic measures of validity. Essentially, researchers are simply taking the validity of the test at face value by looking at whether it appears to measure the target variable. On a measure of happiness, for example, the test would be said to have face validity if it appeared to actually measure levels of happiness.

Obviously, face validity only means that the test looks like it works. It does not mean that the test has been proven to work. However, if the measure seems to be valid at this point, researchers may investigate further in order to determine whether the test is valid and should be used in the future.

A survey asking people which political candidate they plan to vote for would be said to have high face validity, while a complex test used as part of a psychological experiment that looks at a variety of values, characteristics, and behaviors might be said to have low face validity because the exact purpose of the test is not immediately clear, particularly to the participants.

Face validity is simply whether the test appears (at face value) to measure what it claims to. This is the least sophisticated measure of validity.

Tests wherein the purpose is clear, even to naïve respondents, are said to have high face validity. Accordingly, tests wherein the purpose is unclear have low face validity (Nevo, 1985).

A direct measurement of face validity is obtained by asking people to rate the validity of a test as it appears to them. This rater could use a likert scale to assess face validity. For example:

the test is extremely suitable for a given purpose

the test is very suitable for that purpose;

the test is adequate

the test is inadequate

the test is irrelevant and therefore unsuitable

It is important to select suitable people to rate a test (e.g., questionnaire, interview, IQ test etc.). For example, individuals who actually take the test would be well placed to judge its face validity.

Also, people who work with the test could offer their opinion (e.g., employers, university administrators, employers). Finally, the researcher could use members of the general public with an interest in the test (e.g., parents of testees, politicians, teachers etc.).

The face validity of a test can be considered a robust construct only if a reasonable level of agreement exists among raters.

It should be noted that the term face validity should be avoided when the rating is done by "expert" as content validity is more appropriate.

Having face validity does not mean that a test really measures what the researcher intends to measure, but only in the judgment of raters that it appears to do so. Consequently, it is a crude and basic measure of validity.

A test item such as 'I have recently thought of killing myself' has obvious face validity as an item measuring suicidal cognitions, and may be useful when measuring symptoms of depression.

However, the implications of items on tests with clear face validity is that they are more vulnerable to social desirability bias. Individuals may manipulate their response to deny or hide problems, or exaggerate behaviors to present a positive image of themselves.

It is possible for a test item to lack face validity but still have general validity and measure what it claims to measure. This is good because it reduces demand characteristics and makes it harder for respondents to manipulate their answers.

For example, the test item 'I believe in the second coming of Christ' would lack face validity as a measure of depression (as the purpose of the item is unclear).

This item appeared on the first version of The Minnesota Multiphasic Personality Inventory (MMPI) and loaded on the depression scale.

Because most of the original normative sample of the MMPI were good Christians only a depression Christian would think Christ is not coming back. Thus, for this particular religious sample the item does have general validity, but not face validity.

Methods of Measuring Face Validity

Face validity is only based on the idea that a test appears valid, but there are ways to determine if a test has face value. Typically, researchers will get this data from their participants in the following ways:

Poll participants: While it may seem counterintuitive, polling participants who have taken part in the research process can help determine face validity because they answer the questions, giving them insight into the test. If most participants feel the test accurately measures their objective, a test is said to have face validity.

Follow-up questionnaire: Asking participants various questions about what they think the test measured and then asking them to look over the data can also determine face validity. Participants look at their scores and tell the researcher if they think the test was accurate.

7.3. Content Validity

A test has a content validity to the extent that the items in the test are judged to constitute a representative sample of some clearly specified universal knowledge of scales. This type of validity is most relevant to achievement tests. A well-constructed achievement test should cover the objectives of instructions, not just its subject-matter.

Content must therefore be broadly defined to include major objectives, such as the application of principles and interpretation of data as well as factual knowledge. It depends on the relevance of the individual's test response to the behaviors under consideration.

Content validity should not be confused with face validity. Later is not valid in technical sense; which refers not to what the test actually measures, but to what it appears superficially measures.

To produce valid results, the content of a test, survey or measurement method must cover all relevant parts of the subject it aims to measure. If some aspects are missing from the measurement (or if irrelevant aspects are included), the validity is threatened.

7.4. Construct validity

A construct refers to a concept or characteristic that can't be directly observed, but can be measured by observing other indicators that are associated with it.

Constructs can be characteristics of individuals, such as intelligence, obesity, job satisfaction, or depression; they can also be broader concepts applied to organizations or social groups, such as gender equality, corporate social responsibility, or freedom of speech.

Example

There is no objective, observable entity called "depression" that we can measure directly. But based on existing psychological research and theory, we can measure depression based on a collection of symptoms and indicators, such as low self-confidence and low energy levels.

The logic of construct validation involves whether it is highly systematized or loose. Construct validation was introduced to specify types of research required in developing tests for which the conventional views on validation are inappropriate. Performance tests and some tests of ability are interpreted in terms of attributes for which there is no adequate criteria.

Construct validity was invented by Cornball and Meehl (1955). This type of validity refers to the extent to which a test captures a specific theoretical construct or trait, and it overlaps with some of the other aspects of validity interpretations are consistent with a nomological network involving theoretical and observational terms (Cronbach&Meehl, 1955).

The more evidence a researcher can demonstrate for a test's construct validity the better. However, there is no single method of determining the construct validity of a test.

Instead, different methods and approaches are combined to present the overall construct validity of a test. For example, factor analysis and correlational methods can be used.

To test for construct validity it must be demonstrated that the phenomenon being measured actually exists. So, the construct validity of a test for intelligence, for example, is dependent on a model or theory of intelligence.

Construct validity entails demonstrating the power of such a construct to explain a network of research findings and to predict further relationships.

Construct validity does not concern the simple, factual question of whether a test measures an attribute.Instead it is about the complex question of whether test score

7.5. Internal and External Validity

Internal and external validity are used to determine whether or not the results of an experiment are meaningful. Internal validity relates to the way a test is performed, while external validity examines how well the findings may apply in other settings.

What is internal and external validity in research?

Internal validity refers to whether the effects observed in a study are due to the manipulation of the independent variable and not some other factor.

In-other-words there is a causal relationship between the independent and dependent variable.

Internal validity can be improved by controlling extraneous variables, using standardized instructions, counter balancing, and eliminating demand characteristics and investigator effects.

External validity refers to the extent to which the results of a study can be generalized to other settings (ecological validity), other people (population validity) and over time (historical validity).

External validity can be improved by setting experiments in a more natural setting and using random sampling to select participants.

7.6. Criterion- Related Validity

Both predictive and concurrent validity belong to the common head, 'Criterion related validity', It applies when one wishes to infer from a test score and individual's most probable standing on some other variable called a criterion. Criterion is some behavior or event which is duly known or agreed to be a valid measure of the variable.

Statements of predictive validity indicate the extent to which an individual's future level on the criterion can be predicted from a knowledge of a prior test performance; statements of concurrent validity indicate the extent an individual's present standing on the criterion.

To evaluate criterion validity, you calculate the correlation between the results of your measurement and the results of the criterion measurement. If there is a high correlation, this gives a good indication that your test is measuring what it intends to measure.

Concurrent validity

It reflects only the status score at a particular time. Under appropriate circumstances data obtained in a concurrent study may be used to estimate the predictive validity of a test. However, concurrent validity should not be used as a substitute for predictive validity without any appropriate supporting rationale.

This is the degree to which a test corresponds to an external criterion that is known concurrently (i.e. occurring at the same time).

If the new test is validated by a comparison with a currently existing criterion, we have concurrent validity.

Very often, a new IQ or personality test might be compared with an older but similar test known to have good validity already.

The Predictive validity

The Predictive Validity of the test is described in an objective and quantitative fashion by the degree of relationship between predictor's scores or test scores and criterion scores. Thus, the Pearson's Coefficient of Correlation or its variances such as biserial, point biserial etc. are commonly used to describe the predictive value.

This is the degree to which a test accurately predicts a criterion that will occur in the future.

For example, a prediction may be made on the basis of a new intelligence test, that high scorers at age 12 will be more likely to obtain university degrees several years later. If the prediction is born out then the test has predictive validity.

7.7. Summary

In the field of psychology, researchers are looking to gather data about the mind and human behavior. To collect this data, researchers create tests in which participants will answer questions and be observed completing particular tasks. When it comes to psychological testing, the most critical aspect of a test is validity. What is validity in psychology, and why is it important?

If something is described as valid, it means that the thing in question is logical and factually sound, but it is slightly different in psychology. The validity definition in psychology assumes that the test in question measures precisely what it aims to measure, meaning the data collected is accurate and represents some truth compared to others outside of the study. If it does, then the test is valid.

For example, if a person takes an IQ test, one would assume the test will accurately measure the person's level of intelligence. However, IQ tests have questions that connect to vocabulary, pattern recognition, memory, and more, meaning researchers have to ensure the test measures precisely what it aims to measure. In an IQ test, the person's ability to reason and not simply their ability to recall information and find patterns.

Validity is important because it determines what survey questions to use and helps ensure that researchers are using questions that truly measure the issues of importance. The validity of a survey is considered to be the degree to which it measures what it claims to measure.

7.8. Keywords

Sampling, Probability sampling, Simple random sampling, Cluster sampling, Systematic sampling, Stratified random sampling, Non-probability sampling, Convenience sampling, Purposive sampling, Snowball sampling, Quota sampling, Confidence interval, Reliability, Stability characteristics, Availability characteristics, Robustness characteristics, Recovery characteristics, Accuracy characteristics, Test-retest method, Alternate or parallel form method, Split-half method, Method of rational equivalence, Validity, Content validity, Construct validity, Concurrent validity, Predictive validity, Criterion- related validity.

7.9. Self-Assessment

1. A sample is a smaller set of data.

A. True

B. False

2. Sampling is of four types.

A. True

B. False

3. There are four methods of estimating reliability.

A. True

B. False

4. Sampling can reduce cost and time of research.

A. True

B. False

5. A valid test measures what it purports to measure.

A. True

B. False

6. Method of Rational Equivalence is based on----------

a. Kuder-Richardson Formula

b. Spearman- Brown Formula

c. Pearson product moment Formulae

d. None of these

7. In a multiple-choice test, guessing lowers the------.

a. Validity
b. Reliability
c. Predictability
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8. Split-half method is based on---------

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d. None of these

9. The concept of validity was formulated by--------

A. Pearson
B. Kelly
C. Mc. Namer
D. None of these

10. Which is not a common confidence interval?

a. 90%
b. 99%
c. 80%
d. None of these

11. When the researcher collects samples purely on the basis of his/her own discretion---------

a. Random sampling
b. purposive sampling
c. Quota sampling
d. None of these

12. All include in the characteristics of sampling except---------

a. Goal oriented
b. Imaginative
c. Proportional
d. None of these

13. The question of validity is raised in the context of ---------- points.

a. 2
b. 3
c. 4
d. 5

14. Characteristics of reliability include everything except-------

a. Stability

b. Novelty

c. Accuracy

d. None of these

15. In -------- sampling, each member has the same probability of being selected.

a. random

b. quota

c. Snowball

d. None of these

Answers for Self-Assessment

1T, 2F, 3T, 4T, 5T, 6 A, 7B, 8B, 9B, 10C, 11B, 12B,13B, 14B, 15A

7. 10. Review Questions

1. Briefly describe different types of Sampling.
2. What are the different methods of estimating Reliability? Describe them.
3. What are the components of Reliability?
4. Narrate different methods of estimating Validity.
5. What is Sampling? How to determine a sample size?
6. What are the different types of Sampling?
7. What are the characteristics of Reliability?
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9. What are the characteristics of Sampling?
10. Define Sampling? What are the advantages of Sampling?

Further Readings

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Unit-08: Variables

CONTENTS

Objectives

After completion of this unit, the students will be able to:

- understand the concept of Variable
- know different types of Variables
- familiarize with the application of different Variables

Introduction

A variable is any characteristics, number, or quantity that can be measured or counted. A variable may also be called a data item. Age, sex, business income and expenses, country of birth, capital expenditure, class grades, eye colour and vehicle type are examples of variables. It is called a variable because the value may vary between data units in a population, and may change in value over time.

For example; 'income' is a variable that can vary between data units in a population (i.e. the people or businesses being studied may not have the same incomes) and can also vary over time for each data unit (i.e. income can go up or down).

A variable is any entity that can take on different values. OK, so what does that mean? Anything that can vary can be considered a variable. For instance, age can be considered a variable because age can take different values for different people or for the same person at different times. Similarly, country can be considered a variable because a person's country can be assigned a value.

Variables aren't always 'quantitative' or numerical. The variable city consists of text values like New York or Sydney. We can, if it is useful, assign quantitative values instead of (or in place of) the text values, but we don't have to assign numbers in order for something to be a variable. It's also important to realize that variables aren't only things that we measure in the traditional sense. For instance, in much social research and in program evaluation, we consider the treatment or program to be made up of one or more variables (i.e., the 'cause' can be considered a variable). An educational program can have varying amounts of 'time on task', 'classroom settings', 'student-teacher ratios', and so on. So even the program can be considered a variable (which can be made up of a number of sub-variables).

Another important distinction having to do with the term 'variable' is the distinction between an independent and dependent variable. This distinction is particularly relevant when you are investigating cause-effect relationships. It took me the longest time to learn this distinction. (Of course, I'm someone who gets confused about the signs for 'arrivals' and 'departures' at airports – do I go to arrivals because I'm arriving at the airport or does the person I'm picking up go to arrivals because they're arriving on the plane!). I originally thought that an independent variable was one that would be free to vary or respond to some program or treatment, and that a dependent variable must be one that depends on my efforts (that is, it's the treatment). But this is entirely backwards! In fact the independent variable is what you (or nature) manipulates – a treatment or program or cause. The dependent variable is what is affected by the independent variable – your effects or outcomes. For example, if you are studying the effects of a new educational program on student achievement, the program is the independent variable and your measures of achievement are the dependent ones.

Finally, there are two traits of variables that should always be achieved. Each variable should be exhaustive, it should include all possible answerable responses. For instance, if the variable is "religion" and the only options are "Protestant", "Jewish", and "Muslim", there are quite a few religions I can think of that haven't been included. The list does not exhaust all possibilities. On the other hand, if you exhaust all the possibilities with some variables – religion being one of them – you would simply have too many responses. The way to deal with this is to explicitly list the most common attributes and then use a general category like "Other" to account for all remaining ones. In addition to being exhaustive, the attributes of a variable should be mutually exclusive, no respondent should be able to have two attributes simultaneously. While this might seem obvious, it is often rather tricky in practice. For instance, you might be tempted to represent the variable "Employment Status" with the two attributes "employed" and "unemployed." But these attributes are not necessarily mutually exclusive – a person who is looking for a second job while employed would be able to check both attributes! But don't we often use questions on surveys that ask the respondent to "check all that apply" and then list a series of categories? Yes, we do, but technically speaking, each of the categories in a question like that is its own variable and is treated dichotomously as either "checked" or "unchecked", attributes that are mutually exclusive.

Researchers and statisticians use variables to describe and measure the items, places, people or ideas they are studying. Many types of variables exist, and you must choose the right variable to measure when designing studies, selecting tests and interpreting results. A strong understanding of variables can lead to more accurate statistical analyses and results. In this article, we describe the types of variables and answer some frequently asked questions.

Types of Variables

8.1 Independent variables

Independent variables are deliberately chosen by investigators and used in experiments for studying their effects on specific dependent variables. In Psychological experiments, they belong to two types- ***a) Organismic variables***include 1) physical characteristics of the subjects such as their age, sex, eye color, body build, height and weight, any of which may be chosen as the independent variable by the investigator, and 2) psychological characteristics of the subjects such as their intelligence, personality factors, drive, emotionality, neuroticism, extroversion, aspiration level, motivation, anxiety, tension and frustration. In correlational research, the independent variables

used are mainly such physical and psychological characteristics of the subjects. Such independent variables can rarely be manipulated or fixed by the investigator; for example, the latter cannot directly manipulate the intelligence, personality, age or sex of a subject. So, such independent variables are liable to random changes and may be considered as classification variables. Nevertheless, such a variable can be manipulated indirectly through a selection procedure like the choice of subjects with specific required levels of intelligence.

b) Stimulus variables consist of such environmental events both physical and social variables, which stimulates specific receptors of the subjects to affect the dependent variables, viz, a specific behavior of the subject. The investigator can directly manipulate or fix the stimulus variable chosen as the independent variable, such as changes in the intensity of the stimulating light, in the number of syllables offered in memory experiments, in the color of the light stimulus in an experiment of after images, in the pitch of a sound stimulus or in the decibels of noise used as the independent variable in experiments of attention, or in the instructions for reaction time experiments. Such stimulus variables, being under the manipulative control of the investigator, are not liable to random changes and may be considered as, 'fixed' treatment variables.

An independent variable is a singular characteristic that the other variables in your experiment cannot change. Age is an example of an independent variable. Where someone lives, what they eat or how much they exercise are not going to change their age. Independent variables can, however, change other variables. In studies, researchers often try to find out whether an independent variable causes other variables to change and in what way.

A variable that is not affected by anything that you, the researcher, does. Usually plotted on the x-axis.

An Independent variable is a variable based on which the dependent variable is predicted. This variable is chosen, manipulated and measured by the researcher aimed at figuring out its relationship with other variables.

The independent variable might have a positive or negative effect on the dependent variable; that is, any kind of change in the independent variable might result in a change in the dependent variable. Accordingly, the reason behind the dependent variable's change can be looked for in the change which has been applied to the independent variable. In non-experimental research, the independent variable is not manipulated, and intact groups are chosen assuming that the independent variable has an effect on the dependent variable.

It's important to understand the variable importance in order to achieve high accuracy. The independent variables used in a model are meant to explain the maximum variance in dependent variable.

For example: We have a data set with 100 variables. We build a model using those 100 variables and get adjusted R2 as 80%. Adjusted R2 is nothing but explained variance in the dependent variable from independent variable.

Now, we did variable importance check and found that only 20 out of 100 are highly important. We build another model. This time we get adjusted R2 as 84%. This means, only 20 variables are sufficient enough to explain 84% variance in dependent variable.

In regression, you can find variable importance in many ways. In linear regression, you can do forward selection, backward selection, stepwise selection etc. This helps in improving better and accurate models.

In logistic regression, you can check the significance of individual variables.

In SPSS, this metric is available in "Variables in the Equation Table". In this table, focus on "Sig." column which shows the significance of a variable in the model.

With 95% confidence interval, if Sig < 0.05, the variable will significant, else it won't be significant. The image shown below will help you to understand it better.

The independent variable is the variable that is manipulated by the experimenter. For example, in an experiment on the impact of sleep deprivation on test performance, sleep deprivation would be the independent variable. The experimenters would have some of the study participants be sleep-deprived while others would be fully rested.

8.2 Dependent variables

This is the behavioral response to be measured or studied in an experiment after exposure of the subjects to different levels of independent variables, for assessing the effects of the latter on that behavioral response. Dependent variable can be measured by the number of correct responses to a stimulus, the time taken to react to a given stimulus and the accuracy of performance. Sometimes, the dependent variable is measured by objective tests using rating scales. Thus, the dependent variable is often the measured behavioral response to the given individual variables, which constitutes mostly quantitative and continuous data as in personality tests of projective type.

A dependent variable relies on and can be changed by other components. A grade on an exam is an example of a dependent variable because it depends on factors such as how much sleep you got and how long you studied. Independent variables can influence dependent variables, but dependent variables cannot influence independent variables. For example, the time you spent studying (dependent) can affect the grade on your test (independent) but the grade on your test does not affect the time you spent studying.

When analyzing relationships between study objects, researchers often try to determine what makes the dependent variable change and how.

Defendant variable is a variable in which the researcher is interested and in contrary to the independent variable, the dependent variable is not in the control of the researcher, and he/she is not able to manipulate it. In its definition, it could be stated that it is a variable which is affected by the independent variable, it is changed based on the independent variable's changes and the researcher's goal is predicting and describing its changeability.

The dependent variable is the variable that is measured by the experimenter. In the previous example, the scores on the test performance measure would be the dependent variable.

So how do you differentiate between the independent and dependent variables? Start by asking yourself what the experimenter is manipulating. The things that change, either naturally or through direct manipulation from the experimenter, are generally the independent variables. What is being measured? The dependent variable is the one that the experimenter is measuring.

8.3 Intervening variables

It is difficult to identify and control some such psychological organismic variables as act side by side with the independent variable, without the investigator being aware of that, and affect the dependent variable. In an instrumental conditioning experiment, drive may be such a variable, and it may link an independent variable like food deprivation with a dependent variable such as behavioral modification. In industrial work, lack of motivation may be such a variable and the real cause of decrement of the output rather than physiological fatigue considered as the independent variable affecting the dependent variable of industrial production. In an experiment studying the effect of intelligence level of achievement, anxiety may be such a variable to influence achievement (dependent variable) side by side with intelligence (independent variable) and consequently needs to be neutralized first. Such unobserved hypothetical variables, assumed to be associated with independent variables like intelligence, emotion, motivation, aspiration and habit, are based on logical constructs and are called intervening variables.

An intervening variable, sometimes called a mediator variable, is a theoretical variable the researcher uses to explain a cause or connection between other study variables—usually dependent and independent ones. They are associations instead of observations. For example, if wealth is the independent variable, and a long-life span is a dependent variable, the researcher might hypothesize that access to quality healthcare is the intervening variable that links wealth and life span.

Intervening variables, also sometimes called intermediate or mediator variables, are factors that play a role in the relationship between two other variables. In the previous example, sleep problems in university students are often influenced by factors such as stress.As a result, stress might be an

intervening variable that plays a role in how much sleep people get, which may then influence how well they perform on exams.

8.4 Moderating variables

A moderating or moderator variable changes the relationship between dependent and independent variables by strengthening or weakening the intervening variable's effect. For example, in a study looking at the relationship between economic status (independent variable) and how frequently people get physical exams from a doctor (dependent variable), age is a moderating variable. That relationship might be weaker in younger individuals and stronger in older individuals.

When you do correlational research, the terms "dependent" and "independent" don't apply, because you are not trying to establish a cause-and-effect relationship.

However, there might be cases where one variable clearly precedes the other (for example, rainfall leads to mud, rather than the other way around). In these cases you may call the preceding variable (i.e. the rainfall) the predictor variable and the following variable (i.e. the mud) the outcome variable.

The moderator variable changes the relationship between the independent and dependent variable. In points of the fact, the presence of the third variable affects the relationship which was expected from the main variables; thus, it can be considered as the second independent variable.

8.5 Control variables

Control or controlling variables are characteristics that are constant and do not change during a study. They have no effect on other variables. Researchers might intentionally keep a control variable the same throughout an experiment to prevent bias. For example, in an experiment about plant development, control variables might include the amounts of fertilizer and water each plant gets. These amounts are always the same so that they do not affect the plants' growth.

A factor in an experiment which must be held constant. For example, in an experiment to determine whether light makes plants grow faster, you would have to control for soil quality and water.

It happens in some occasions that the researcher decides to delete or neutralize the effect of some variables since examining all the variables simultaneously seems impossible and uncontrollable for him/her that the mentioned variables are called control variables. It is noteworthy that in some particular cases, the moderator variable can play the control variable' role.

In many cases, extraneous variables are controlled for by the experimenter. A controlled variable is one that is held constant throughout an experiment.

In the case of participant variables, the experiment might select participants that are the same in background and temperament to ensure that these factors don't interfere with the results. Holding these variables constant is important for an experiment because it allows researchers to be sure that all other variables remain the same across all conditions.

Using controlled variables means that when changes occur, the researchers can be sure that these changes are due to the manipulation of the independent variable and not caused by changes in other variables.

It is important to also note that a controlled variable is not the same thing as a control group. The control group in a study is the group of participants who do not receive the treatment or change in the independent variable.

All other variables between the control group and experimental group are held constant (i.e., they are controlled). The dependent variable being measured is then compared between the control group and experimental group to see what changes occurred because of the treatment.

8.6 Extraneous variables

These are numerous variables which occur or rise in the physical or social environment, in the subjects under study, or in the experimental procedure, but are not intended to be used as the

dependent or independent variables in the experiment being undertaken. Extraneous variables include such physical and social environment factors as well as such physical and psychological characteristics of the subjects, as are other than dependent and independent variables. They are additional variables happening to occur in any experiment, such as noise, temperature, light, draught and humidity in the laboratory, the order of presenting the stimuli in reaction time experiment, and the size of printed materials used in a memory experiment, none of which is chosen or deliberately used by the investigator for the purpose of the experiment. According to the dependent variable being studied may or may not be affected by such extraneous variables, they belong to two classes.

A) Relevant Variables-

These are such extraneous variables which, though not deliberately used or intended to be used by the investigator to study their effects on the dependent variables in that particular experiment, occur spontaneously can influence and affect the dependent variable and may consequently defeat the purpose of the experiment to study the effect of only the independent variable on the dependent one. The investigator must remain vigilant about these relevant variables and must control them as far as possible so as to minimize their effects on the dependent variable. They can be sought to be controlled by methods like consistency of experimental conditions., balancing and counter balancing, randomization, matching, and changes in design in multi-group experiments. Relevant variables are further classified into

1) subject- relevant-which are organismic variables owing to both physical characteristics (age, sex, race etc.) and psychological characteristics (intelligence, neuroticism, personality factor and motivational aspects) of the subject under study. It is very hard to control these organismic variables because of the difficulties in assessing them from outside and in manipulating them directly.

2) Situational relevant- which are those occur in the experimental situation and the environment; light, noise, temperature, and humidity in the laboratory distractions etc. They can mostly be controlled by the investigator.

3) Sequence relevant- which arise from the sequence of applications of the independent variable and include fatigue, practice, monotony etc.

B) Irrelevant Variables-

These are such variables which do not perceivably affect the dependent variable, for example, hair color, eye color, skin complexion, or economic condition of the subjects may be considered irrelevant variables in an experiment to study the effectof practice on memory.

Extraneous variables are factors that affect the dependent variable but that the researcher did not originally consider when designing the experiment. These unwanted variables can unintentionally change a study's results or how a researcher interprets those results. Take, for example, a study assessing whether private tutoring or online courses are more effective at improving students' Spanish test scores. Extraneous variables that might unintentionally influence the outcome include parental support, prior knowledge of a foreign language or socioeconomic status.

8.7 Quantitative variables

When you collect quantitative data, the numbers you record represent real amounts that can be added, subtracted, divided, etc. There are two types of quantitative variables: discrete and continuous.

Quantitative variables are any data sets that involve numbers or amounts. Examples might include height, distance or number of items. Researchers can further categorize quantitative variables into two types:

Discrete: Any numerical variables you can realistically count, such as the coins in your wallet or the money in your savings account.

Continuous: Numerical variables that you could never finish counting, such as time.A variable with infinite number of values, like "time" or "weight".

8.8 Qualitative variables

Qualitative, or categorical, variables are non-numerical values or groupings. Examples might include eye or hair color. Researchers can further categorize qualitative variables into three types:

Binary: Variables with only two categories, such as male or female, red or blue.

Nominal: Variables you can organize in more than two categories that do not follow a particular order. Take, for example, housing types: Single-family home, condominium, tiny home.

Ordinal: Variables you can organize in more than two categories that follow a particular order. Take, for example, level of satisfaction: Unsatisfied, neutral, satisfied.

Categorical variables represent groupings of some kind. They are sometimes recorded as numbers, but the numbers represent categories rather than actual amounts of things.

variables than can be put into categories. For example, the category "Toothpaste Brands" might contain the variables Colgate and Aqua fresh.

8.9 Confounding variables

A confounding variable is one you did not account for that can disguise another variable's effects. Confounding variables can invalidate your experiment results by making them biased or suggesting a relationship between variables exists when it does not. For example, if you are studying the relationship between exercise level (independent variable) and body mass index (dependent variable) but do not consider age's effect on these factors, it becomes a confounding variable that changes your results.

A variable that hides the true effect of another variable in your experiment. This can happen when another variable is closely related to a variable you are interested in, but you haven't controlled it in your experiment.

Pot size and soil type might affect plant survival as much or more than salt additions. In an experiment you would control these potential confounders by holding them constant.

Extra variables that have a hidden effect on your experimental results.

If a variable cannot be controlled for, it becomes what is known as a confounding variable. This type of variable can have an impact on the dependent variable, which can make it difficult to determine if the results are due to the influence of the independent variable, the confounding variable, or an interaction of the two.4

8.10 Composite variables

A composite variable is two or more variables combined to make a more complex variable. Overall health is an example of a composite variable if you use other variables, such as weight, blood pressure and chronic pain, to determine overall health in your experiment.

A variable that is made by combining multiple variables in an experiment. These variables are created when you analyze data, not when you measure it.

The three plant health variables could be combined into a single plant-health score to make it easier to present your findings.

A variable that can only take on a certain number of values. For example, "number of cars in a parking lot" is discrete because a car park can only hold so many cars.

Conclusion

Psychological variables include such variables, many of which cannot be observed directly from outside, can only be inferred from expressions, behaviors and verbal reports of the individuals, and consequently depend on proper evaluation on the cooperation of the subjects involved. They include intelligence, memory, aptitude, ability, attitude, aspirations, anxiety, emotions, personality and motivation. Many of them are hypothetical and abstract in nature, cannot be precisely measured on quantitative scales and can only be assessed qualitatively. Even when quantitatively measurable, some of these variables have an interval scale with an arbitrary zero point instead of a real zero; however, some psychological variables such as the ratios of psychophysical stimuli and calory expenditure in job activities in Industrial Psychology, are measured quantitatively in ratio scale with real zero points.

Psychological experiments involve variables such as dependent, independent, extraneous, relevant and intervening variables.

Keywords

Independent variable, dependent variable, extraneous variable, relevant variable, irrelevant variable, composite variable, confounding variable, qualitative variable, quantitative variable, intervening variable, control variable, moderating variable.

Self-Assessment

1. Variables vary according to the experimental situation.

A. True

B. False

2. Independent variables are not required in research.

A. True

B. False

3. In research, we have to control extraneous variables.

A. True

B. False

4. We see the changes of dependent variables.

A. True

B. False

5. Independent variables vary according to the experimental situation.

A. True

B. False

6. Extraneous variables are of ----- types.
a. one
b. two
c. three
d. four

7. Organismic variables are of -------- types.
a. two
b. three
c. four
d. None of them

8. Independent Variables are of ------- types.
a. one
b. two
c. three
d. None of them

9. Interval Scale has a -------- zero point.
a. real
b. mathematical
c. arbitrary
d. None of them

10. Intervening variables----------
a. Easy to control
b. Not affect the experiment
c. Difficult to control
d. None of them

11. Irrelevant variable------.
a. Do not perceivably affect the dependent variable
b. Directly affect the dependent variable
c. Affect directly to extraneous variable
d. None of them

12. Relevant variables---------
a. Deliberately used by the investigator
b. Not deliberately used by the investigator
c. An equipped test administrator
d. None of them

13. Stimulus variables consist of ----------.
a. Environmental events
b. Physical characteristics
c. Psychological Characteristics
d. None of them

14. Independent Variables are -------chosen by the investigator.
a. unwillingly

b. accidentally
c. deliberately
d. None of them

15. Ratio scale has---------zero point.
a. arbitrary
b. real
c. correlational
d. none of them

Answers for Self-Assessment

1T, 2F, 3T, 4T, 5F, 6B, 7A, 8B, 9C, 10C, 11A, 12B, 13A, 14C, 15B.

Review Questions

1. What is the importance of Independent Variables in Psychological Research?
2. What is the relation between Independent and dependent Variables?
3. Write in details about extraneous variable.
4. What is the significance of Variable in Psychological Research?
5. Briefly narrate the relation between quantitative and qualitative variables.
6. Write a short note on Intervening Variable.
7. Explain composite variables.
8. Write a note on Confounding Variables.
9. How we manipulate variables in Correlational Research?
10. What is the proper management of variables in experimental research?

Further Readings

- The Practice of Social Research by Earl, R. Babbie-13th ed. Wadsworth Publishing Co.inc.2011
- Methods of Social Research by Paul, K. Hatt & William, J. Goode. Surjeet Publication. 2018.

Unit 9:Data and its types

Contents

Objectives

This unit will enable you to:

Know about different types of data;

Understand role of primary and secondary data

Understand how qualitative data works

Acquire knowledge about quantitative data

Introduction

Data: Data can be defined as a systematic record of a particular quantity. It is the different values of that quantity represented together in a set. It is a collection of facts and figures to be used for a specific purpose such as a survey or analysis. When arranged in an organized form, can be called information. The source of data (primary data, secondary data) is also an important factor.

Types of Data

Data may be qualitative or quantitative. Once you know the difference between them, you can know how to use them.

Qualitative data is data concerned with descriptions, which can be observed but cannot be computed. On the contrary, **quantitative data** is the one that focuses on numbers and mathematical calculations and can be calculated and computed.

- So, for the collection and measurement of data, any of the two methods discussed above can be used.

- Although both have its merits and demerits, i.e. while qualitative data lacks reliability, quantitative data lacks a description.
- Both are used in conjunction so that the data gathered is free from any errors.
- Further, both can be acquired from the same data unit only their variables of interest are different, i.e. numerical in case of quantitative data and categorical in qualitative data.

9.1. Primary Data

Primary data is obtained from first-hand sources. In most cases, primary data is collected from the source, i.e. where it originates from and is regarded as the best of its kind. Researchers usually select and tailor the sources of primary data to the needs of their particular study, which allows for adopting a more focused approach to the exploration of the research phenomenon. Hence, issues such as the research aim and objectives as well as the target population and sampling need to be considered.

- This is the data collected from human participants through interviews or surveys.

Interviews provide you with the opportunity to collect detailed insights from industry participants about their company, customers, or competitors.

Questionnaire surveys allow for obtaining a large amount of data from a sizeable population in a cost-efficient way.

This is usually cross-sectional data (i.e. the data collected at one point of time from different respondents). Time-series are found very rarely or almost never in primary data. Nonetheless, depending on the research aims and objectives, certain designs of data collection instruments allow researchers to conduct a longitudinal study.

9.2. Secondary Data

- The main characteristic of secondary data is that it has previously been collected for some other purpose and can be accessed by researchers.

- Although often employed to supplement primary data (e.g. to increase the sample size of studies), many researchers rely on secondary data as the main source of evidence.

- This data is more relevant for economic and financial research but it can also be found in management and marketing research.

- This is the data collected from databases or websites; it does not involve human participants.

- This can be both cross-sectional data (e.g. an indicator for different countries/companies at one point of time) and time-series (e.g. an indicator for one company/country for several years). A combination of cross-sectional data and time-series data is panel data.

9.3. Qualitative Data

They represent some characteristics or attributes. They depict descriptions that may be observed but cannot be computed or calculated. For example, data on attributes such as intelligence, honesty, wisdom, cleanliness, and creativity collected using the students of your class a sample would be classified as qualitative. They are more exploratory than conclusive in nature.

9.4. Quantitative Data

These can be measured and not simply observed. They can be numerically represented and calculations can be performed on them. For example, data on the number of students playing different sports from your class gives an estimate of how many of the total students play which sport. This information is numerical and can be classified as quantitative.

Qualitative and quantitative data

S.N.	Character	Quantitative Data	Qualitative Data
1.	**Definition**	These are data that deal with quantities, values, or numbers.	These data, on the other hand, deals with quality.
2.	**Measurability**	Measurable.	They are generally not measurable.
3.	**Nature of Data**	Expressed in numerical form.	They are descriptive rather than numerical in nature.
4.	**Research Methodology**	Conclusive	Exploratory
5.	**Quantities measured**	Measures quantities such as length, size, amount, price, and even duration.	Narratives often make use of adjectives and other descriptive words to refer to data on appearance, color, texture, and other qualities.
6.	**Method of collection**	Statistics is used to generate and subsequently analyze this type of data.	They are only gained mostly through observation.
7.	**Approach**	Objective	Subjective
8.	**Data Structure**	Structured	Unstructured
9.	**Determines**	Level of occurrence	Depth of understanding
10.	**Reliability**	The uses of statistics add credence or credibility to it so that quantitative data is overall seen as more reliable and objective.	Less reliable and objective.
11.	**Data Collection Techniques**	Quantitative surveys, Interviews, Experiments	Qualitative surveys, Focus group methods, Documental revision, etc.
12.	**Sample**	A large number of representative samples	A small number of non-representative samples
13.	**Outcome**	Develops initial understanding	Recommends the final course of action

In addition to qualitative and quantitative data, it is also important to distinguish between primary and secondary data. What is exciting about these types of data is that they can be used with each other in different combinations. Each combination is employed for different purposes, which you should have a clear understanding of to make the right choice.

9.5. Self-assessment

1. Data refers to systematic record of a particular quantity.

a. True
b. False

2. What type of approach we used in qualitative data?
   a. Subjective
   b. Objective
   c. Imaginary
   d. None of the above
3. What type of approach we used in quantitative data?
   a. Subjective
   b. Objective
   c. Imaginary
   d. None of the above
4. Which type of data is less reliable and objective?
   a. Primary data
   b. Secondary data
   c. Qualitative data
   d. Quantitative data
5. In which type of data has small number of non-representative samples?
   a. Primary data
   b. Secondary data
   c. Qualitative data
   d. Quantitative data
6. In which type of data, we can be accessed previously collected data?
   a. Primary data
   b. Secondary data
   c. Qualitative data
   d. Quantitative data

7. _____is a collection of facts and figures to be used for a specific purpose such as a survey or analysis.
    a. Method
    b. Analysis
    c. Data
    d. Recording
8. Data on the number of students playing different sports from your class gives an estimate of how many of the total students playvarious sport. It is the example of_____?
    a. Qualitative data
    b. Quantitative data
    c. Primary data
    d. Secondary data
9. A large number of representative samples is known as_____?
    a. Qualitative data
    b. Quantitative data
    c. Primary data
    d. Secondary data
10. How would you collect primary data?
    a. Interview
    b. Survey
    c. Questionnaire
    d. All of the above

1	2	3	4	5	6	7	8	9	10
a	a	b	c	c	a	c	b	b	d

9.6. Review Questions

1. What do you mean by data?
2. Explain types of data with appropriate example?
3. What is difference between qualitative and quantitative data?

Further Readings

Unit 10:Sampling Techniques

Contents

Objectives

After the completion of this Unit, the students will be able to:

- understand the concept of Sampling
- know different types of Sampling
- familiarize with the use of Sampling Techniques

Introduction

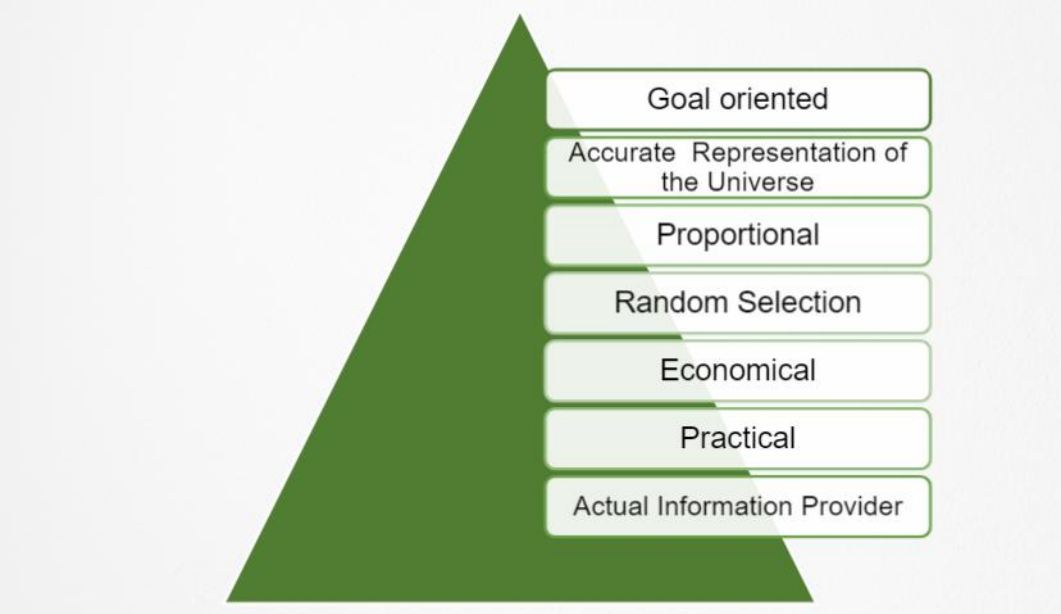
A sample is defined as a smaller set of data that a researcher chooses or selects from a larger population by using a predefined selection method. These elements are known as sample points, sampling units, or observations.

Creating a sample is an efficient method of conducting research. In most cases, it is impossible or costly and time-consuming to research the whole population. Hence, examining the sample provides insights that the researcher can apply to the entire population.

Sampling is a process used in statistical analysis in which a predetermined number of observations are taken from a larger population. The methodology used to sample from a larger population depends on the type of analysis being performed, but it may include simple random sampling or systematic sampling.

10.1 Sampling

Characteristics of Sampling



Goal Oriented

Sampling is done on the basis of the Objectives of Research. The Researcher should have a clear-cut objective for certain sampling techniques. So Sampling is always goal oriented according to the purpose of research.

Actual Representation of the Universe

The sample is drawn from the population or universe. The main purpose of sampling is to take a certain number of samples from the universe and all the characteristics of the population should be there in the sample as if the sample is the miniature form of the population with all its characteristics.

Proportional

Sample should be proportional to the population. All segments of the population should come in the sample in a proportional manner.

Random Selection

Sample should be selected randomly, i.e., each member of the population should have equal opportunity to be selected in the sample. It is also free from any bias of the researcher and other means so that the characteristics of the population can be equally distributed in the sample size.

Economical

Sample size to be taken should be economical to the purpose of the research. Very lengthy samples may create problems to the effectiveness and feasibility of the research.

Practical

Sample should be practical as to the objectives of the research. Any fictitious sample or sample of any type or number which cannot be taken on a practical basis can be avoided.

Actual Information Provider

Sample gives the provision for getting actual information for the research. Sample of certain individuals will give the information which is the ultimate source of the research to make analysis of the results.

10.2 Types of Sampling

Sampling is of two types-1. Probability sampling and 2. Non-Probability Sampling

Probability Sampling

- Probability sampling is a method of deriving a sample where the objects are selected from a population-based on the theory of probability.
- This method includes everyone in the population, and everyone has an equal chance of being selected. Hence, there is no bias whatsoever in this type of sample.
- Each person in the population can subsequently be a part of the research. The selection criteria are decided at the outset of the market research study and form an important component of research.

Probability Sampling can be classified into the followings-

Simple Random Sampling

The most straightforward way of selecting a sample is simple random sampling. In this method, each member has an equal chance of being a part of the study.

The objects in this sample population are chosen purely on a random basis, and each member has the same probability of being selected.

 , if a university dean would like to collect feedback from students about their perception of the teachers and level of education, all 1000 students in the University could be a part of this sample.

Any 100 students can be selected at random to be a part of this sample.

Cluster Sampling

Cluster sampling is a type of sampling method where the respondent population is divided into equal clusters.

Clusters are identified and included in a sample based on defining demographic parameters such as age, location, sex, etc.

This makes it extremely easy for a survey creator to derive practical inferences from the feedback.

 , if the FDA wants to collect data about adverse side effects from drugs, they can divide the mainland US into distinctive clusters, like states. Research studies are then administered to respondents in these clusters.

Systematic Sampling

Systematic sampling is a sampling method where the researcher chooses respondents at equal intervals from a population.

The approach to select the sample is to pick a starting point and then pick respondents at a pre-defined sample interval.

 while selecting 1,000 volunteers for the Olympics from an application list of 10,000 people, each applicant is given a count of 1 to 10,000. Then starting from 1 and selecting each respondent with an interval of 10, a sample of 1,000 volunteers can be obtained.

Stratified Random Sampling

Stratified random sampling is a method of dividing the respondent population into distinctive but pre-defined parameters in the research design phase.

In this method, the respondents don't overlap but collectively represent the whole population.

 a researcher looking to analyze people from different socioeconomic backgrounds can distinguish respondents into their annual salaries.

These form smaller groups of people or samples, and then some objects from these samples can be used for the research study.

Block Sampling

Block sampling takes a consecutive series of items within the population to use as the sample. For example, a list of all sales transactions in an accounting period could be sorted in various ways, including by date or by dollar amount. An auditor may request that the company's accountant provide the list in one format or the other in order to select a sample from a specific segment of the list. This method requires very little modification on the auditor's part, but it is likely that a block of transactions will not be representative of the full population.

Non-Probability Sampling

Convenience Sampling

Convenience sampling, in easy terms, stands for the convenience of a researcher accessing a respondent.

There is no scientific method of deriving this sample. Researchers have nearly no authority over selecting the sample elements, and it's purely done on the basis of proximity and not representativeness.

This non-probability sampling method is used when there are time and cost limitations in collecting feedback.

Purposive/Judgmental Sampling

The judgmental or purposive sampling method is a method of developing a sample purely on the basis and discretion of the researcher purely on the basis of the nature of study along with his/her understanding of the target audience. In this sampling method, people who only fit the research criteria and end objectives are selected, and the remaining are kept out.

Snowball Sampling

Snowball sampling or chain-referral sampling is defined as a non-probability sampling technique in which the samples have traits that are rare to find. This is a sampling technique, in which existing subjects provide referrals to recruit samples required for a research study.

, while collecting feedback about a sensitive topic like AIDS, respondents aren't forthcoming with information. In this case, the researcher can recruit people with an understanding or knowledge of such people and collect information from them or ask them to collect information.

Quota Sampling

Quota sampling is a method of collecting a sample where the researcher has the liberty to select a sample based on their strata. The primary characteristic of this method is that two people cannot exist under two different conditions.

Advantages of Sampling

1. ***Reduced cost & time:*** Since using a sample reduces the number of people that have to be reached out to, it reduces cost and time.

2. ***Reduced resource deployment***: It is obvious that if the number of people involved in a research study is much lower due to the sample, the resources required are also much less.

3. ***Accuracy of data:*** Since the sample is indicative of the population, the data collected is accurate. Also, since the respondent is willing to participate, the survey dropout rate is much lower, which increases the validity and accuracy of the data.
4. ***Intensive & exhaustive data***: Since there are lesser respondents, the data collected from a sample is intense and thorough. More time and effort are given to each respondent rather than having to collect data from a lot of people.

5. ***Apply properties to a larger population:*** Since the sample is indicative of the broader population, it is safe to say that the data collected and analyses from the sample can be applied to the larger population, and it would hold true.

How to Determine a Sample Size?

The right sample size is essential for the success of data collection in a market research study. But is there a correct number for sample size? What parameters decide the sample size? What are the distribution methods of the survey? To understand all of this and make an informed calculation of the right sample size, it is first essential to understand four important variables that form the basic characteristics of a sample.

Population size*:* The population size is all the people that can be considered for the research study. This number, in most cases, runs into huge amounts. For example, the population of the United States is 327 million. But in market research, it is impossible to consider all of them for the research study.

The margin of error (confidence interval): The margin of error is depicted by a percentage that is a statistical inference about the confidence of what number of the population depicts the

actual views of the whole population. This percentage helps towards the statistical analysis in selecting a sample and how much error in this would be acceptable.

Confidence level: This metric measures where the actual mean falls within a confidence interval. The most common confidence intervals are 90%, 95%, and 99%.

Standard deviation*:* This metric covers the variance in a survey. A safe number to consider is .5, which would mean that the sample size has to be that large.

Conclusion

In research terms a sample is a group of people, objects, or items that are taken from a larger population for measurement. The sample should be representative of the population to ensure that we can generalize the findings from the research sample to the population as a whole.

10.3 Sampling Error

A sampling error is a statistical error that occurs when an analyst does not select a sample that represents the entire population of data. As a result, the results found in the sample do not represent the results that would be obtained from the entire population.

Sampling is an analysis performed by selecting a number of observations from a larger population. The method of selection can produce both sampling errors and non-sampling errors.

- A sampling error occurs when the sample used in the study is not representative of the whole population.
- Sampling is an analysis performed by selecting a number of observations from a larger population.
- Even randomized samples will have some degree of sampling error because a sample is only an approximation of the population from which it is drawn.
- The prevalence of sampling errors can be reduced by increasing the sample size.
- Random sampling is an additional way to minimize the occurrence of sampling errors.
- In general, sampling errors can be placed into four categories: population-specific error, selection error, sample frame error, or non-response error.
-

Types of Sampling Error

Population-Specific Error

A population-specific error occurs when a researcher doesn't understand who to survey.

Selection Error

Selection error occurs when the survey is self-selected, or when only those participants who are interested in the survey respond to the questions. Researchers can attempt to overcome selection error by finding ways to encourage participation.

Sample Frame Error

A sample frame error occurs when a sample is selected from the wrong population data.

Non-response Error

A non-response error occurs when a useful response is not obtained from the surveys because researchers were unable to contact potential respondents (or potential respondents refused to respond).

Eliminating Sampling Errors

The prevalence of sampling errors can be reduced by increasing the sample size. As the sample size increases, the sample gets closer to the actual population, which decreases the potential for deviations from the actual population. Consider that the average of a sample of 10 varies more than the average of a sample of 100. Steps can also be taken to ensure that the sample adequately represents the entire population.

Researchers might attempt to reduce sampling errors by replicating their study. This could be accomplished by taking the same measurements repeatedly, using more than one subject or multiple groups, or by undertaking multiple studies.

Random sampling is an additional way to minimize the occurrence of sampling errors. Random sampling establishes a systematic approach to selecting a sample. For example, rather than choosing participants to be interviewed haphazardly, a researcher might choose those whose names appear first, 10th, 20th, 30th, 40th, and so on, on the list.

Examples of Sampling Errors

Assume that XYZ Company provides a subscription-based service that allows consumers to pay a monthly fee to stream videos and other types of programming via an Internet connection.

The firm wants to survey homeowners who watch at least 10 hours of programming via the Internet per week and that pay for an existing video streaming service. XYZ wants to determine what percentage of the population is interested in a lower-priced subscription service. If XYZ does not think carefully about the sampling process, several types of sampling errors may occur.

A population specification error would occur if XYZ Company does not understand the specific types of consumers who should be included in the sample. For example, if XYZ creates a population of people between the ages of 15 and 25 years old, many of those consumers do not make the purchasing decision about a video streaming service because they may not work full-time. On the other hand, if XYZ put together a sample of working adults who make purchase decisions, the consumers in this group may not watch 10 hours of video programming each week.

Selection error also causes distortions in the results of a sample. A common example is a survey that only relies on a small portion of people who immediately respond. If XYZ makes an effort to follow up with consumers who don't initially respond, the results of the survey may change. Furthermore, if XYZ excludes consumers who don't respond right away, the sample results may not reflect the preferences of the entire population.

Sampling Error vs. Non-sampling Error

There are different types of errors that can occur when gathering statistical data. Sampling errors are the seemingly random differences between the characteristics of a sample population and those of the general population. Sampling errors arise because sample sizes are inevitably limited. (It is impossible to sample an entire population in a survey or a census

Company XYZ will also want to avoid non-sampling errors. Non-sampling errors are errors that result during data collection and cause the data to differ from the true values. Non-sampling errors are caused by human error, such as a mistake made in the survey process.

If one group of consumers only watches five hours of video programming a week and is included in the survey, that decision is a non-sampling error. Asking questions that are biased is another type of error.

Summary

Sampling is a process used in statistical analysis in which a predetermined number of observations are taken from a larger population. The methodology used to sample from a larger population depends on the type of analysis being performed, but it may include simple random sampling or systematic sampling.

A sample is defined as a smaller set of data that a researcher chooses or selects from a larger population by using a pre-defined selection method. These elements are known as sample points, sampling units, or observations. Creating a sample is an efficient method of conducting research. In most cases, it is impossible or costly and time-consuming to research the whole population. Hence, examining the sample provides insights that the researcher can apply to the entire population.

Keywords

Sampling, Probability sampling, Simple random sampling, Cluster sampling, Systematic sampling, Stratified random sampling, Non-probability sampling, Convenience sampling, Purposive sampling, Snowball sampling, Quota sampling, Confidence interval, Reliability, Stability characteristics, Availability characteristics, Robustness characteristics, Recovery characteristics, Accuracy characteristics, Test-retest method, Alternate or parallel form method, Split-half method, Method of rational equivalence, Validity, Content validity, Construct validity, Concurrent validity, Predictive validity, Criterion- related validity.

SelfAssessment

1. A sample is a smaller set of data.

A. True

B. False

2. Sampling is of four types.

A. True

B. False

3. There are four methods of estimating reliability.

A. True

B. False

4. Sampling can reduce cost and time of research.

A. True

B. False

5. A valid test measures what it purports to measure.

A. True

B. False

6. Method of Rational Equivalence is based on----------

a. Kuder-Richardson Formula

b. Spearman- Brown Formula

c. Pearson product moment Formulae

d. None of these

7. In a multiple-choice test, guessing lowers the------.

a. Validity

b. Reliability

c. Predictability

d. None of these

8. Split-half method is based on---------

a. Validity

b. Reliability

c. Predictability

d. None of these

9. The concept of validity was formulated by--------

A. Pearson

B. Kelly

C. Mc. Namer

D. None of these

10. Which is not a common confidence interval?

a. 90%

b. 99%

c. 80%

d. None of these

11. When the researcher collects samples purely on the basis of his/her own discretion---------

a. Random sampling

b. purposive sampling

c. Quota sampling

d. None of these

12. All include in the characteristics of sampling except---------

a. Goal oriented

b. Imaginative

c. Proportional

d. None of these

13. The question of validity is raised in the context of ---------- points.

a. 2

b. 3

c. 4

d. 5

14. Characteristics of reliability include everything except-------

a. Stability

b. Novelty

c. Accuracy

d. None of these

15. In -------- sampling, each member has the same probability of being selected.

a. random

b. quota

c. Snowball

d. None of these

Answers for Self-Assessment

1T, 2F, 3T, 4T, 5T, 6 A, 7B, 8B, 9B, 10C, 11B, 12B,13B, 14B, 15A

Review Questions

1. Briefly describe different types of Sampling.
2. What are the different methods of estimating Reliability? Describe them.
3. What are the components of Reliability?
4. Narrate different methods of estimating Validity.
5. What is Sampling? How to determine a sample size?
6. What are the different types of Sampling?
7. What are the characteristics of Reliability?
8. What are the components and characteristics of Validity?
9. What are the characteristics of Sampling?
10. Define Sampling? What are the advantages of Sampling?

Further Readings

- Fundamentals of Statistics by S.C. Gupta. Himalaya Publishing House.2018
- Statistics for Psychology by R. Gudmund Iversen. W.C. Brown. 2016

Unit 11: Methods of Data Collection

Contents

Objectives

After completion of this Unit, the students will be able to:

- understand different facets of Observational Method
- know different components of Case Study Method

Familiarize with the application of different methods in Psychological Research.

Introduction

The observation method is described as a method to observe and describe the behavior of a subject. As the name suggests, it is a way of collecting relevant information and data by observing. It is also referred to as a participatory study because the researcher has to establish a link with the respondent and for this has to immerse himself in the same setting as theirs. Only then can he use the observation method to record and take notes.

Observation method is used in cases where you want to avoid an error that can be a result of bias during evaluation and interpretation processes. It is a way to obtain objective data by watching a participant and recording it for analysis at a later stage.

The observation method is most commonly used especially in studies relating to behavioral sciences. Observation becomes a scientific tool when it serves a formulated research purpose, is systematically planned and recorded, and is subjected to checks and controls on validity and reliability.

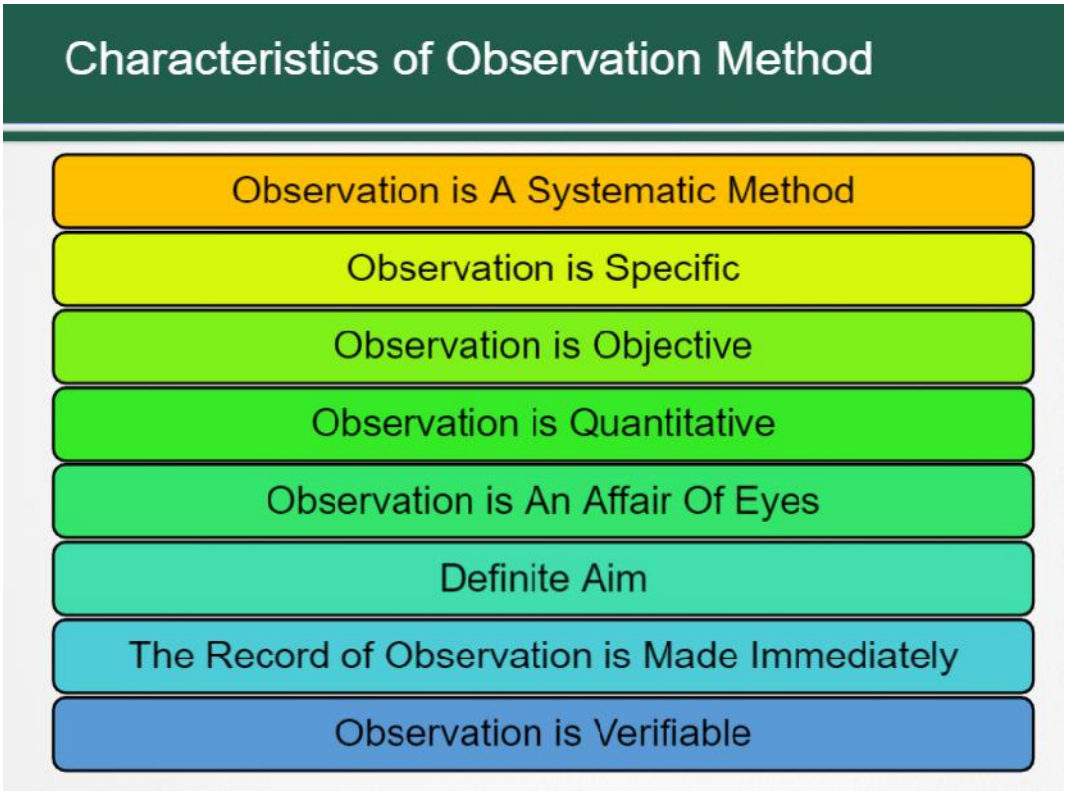
Observation can thus be defined as methodologically controlled non-random purposive examination of the actions of one or several individuals in order to discover some distinct characteristics of personality.

11.1Observation Method

Prerequisites of Observation Method

- Prolonged Engagement in A Setting or Social Situation.
- Clearly Expressed, Self-conscious Notations of How Observing Is Done.
- Methodical And Tactical Improvisation in Order to Develop a Full Understanding of The Setting of Interest.

Characteristics of Observation Method



Observation is a Systematic Method

Though Observation is a universal method, it can be done in a systematic manner. Careful recordings of the behavior, the sequence of behavior in one circumstance and the desired objectives of the research is also being taken care of in a systematic way. Only from the behavior in the natural settings, with the spontaneity of the respondent, can one systematically analyze the desired goal of the research.

Observation is Specific

Though Observation is a universal method, In Research when we are using the Observation method as a technique, we can record specific observations relating to the objective of the research. Specific behavior of the individual is being observed and accordingly that will be analyzed. So, for data collection, observation is done in a specific way.

Observation is Objective

Observation methods can be applied on an objective basis. Each and every observation which has been recorded can be objectively defined and analyzed in statistical procedure. Behavior of the individual can be categorized in numbers and subsequently statistical analysis can be done for interpretation of those data.

Observation is Quantitative

Observation method can be used as quantitative analysis where each and every observation can be put in numbers and those numbers are being analyzed through statistical methods to give the research findings an authenticity and also the reliability of the results.

Observation is an affair of eyes

In the observation method, the observer should be very keen in observing every minute detail in the natural settings. The spontaneity of the respondent can express many things where the observer has to record those, no such trivial things also should not be left unnoticed. It is the quality of the observer to see all those details. The main procedure of observation is to see all the details of the respondents.

Definite Aim

Observation method has a definite aim to collect the specific behavior of the respondents. Before observing the individual, the researcher should go for a definite plan of recording those details in specific forms. Data collection is being done on that procedure only. The aim of observation is related to the objectives of the research study.

The record of Observation is made immediately

As soon as the behavior of the respondent has expressed, that should be recorded immediately, otherwise, the researcher may forget those, or he/she has to observe many things of that person simultaneously, immediate recording can give the researcher a systematic process to record the whole episode one after another.

Observation is Verifiable

The recording of the respondent can be verified by other researchers. Verification is required to show the reliability of the occurrence of the response. Verification also proves that the prediction of the research findings can be checked and it may be generalized for the whole population.

Types of Observation

- Structured Observation
- Unstructured Observation
- Participant Observation
- Non-Participant Observation
- Controlled Observation
- Uncontrolled Observation

Structured Observation: -

Here the units to be observed are carefully defined in advance, the style of recording is definite, conditions standardized and pertinent data recorded.

It is appropriate for Descriptive studies.

Unstructured Observation: -

Observation is said to be unstructured when it takes place without any characteristic thought in advance.

This type of observation is best suited for exploratory studies.

Participant Observation: -

If the observer observes by making himself, more or less, a member of the group he is observing so that he can experience the happenings around him, the observation is called participant observation.

Non-Participant Observation: -

When the observer is observing the group not being a part of it then we talk of non-participant observation. It can also take the form of disguised observation.

Controlled Observation: -

When observation takes place according to definite pre-arranged plans, involving experimental procedures, the same is then termed as controlled observation.

Uncontrolled Observation: -

When observation takes place in a neutral setting, it may be termed as uncontrolled observation. The main drawback of it is subjective interpretation.

If the observation is done accurately, subjective bias is eliminated. The information obtained using the observation method relates to what is currently happening. This method is independent of the respondent's willingness to respond.

Advantages of Observation Method

- Simplest Method.
- Useful For Framing Hypothesis.
- Greater Accuracy.
- A universal method
- Observation is the only appropriate tool for certain cases.
- Independent of people's willingness to report.

Simplest Method

Observation method is the simplest method. Here the research has to observe the behavior of the individual in the direct setting. No need of controlling the set up as it is seen in the Experimental method. Very few recording devices are required for the effective fulfillment of the procedure. Here the researcher has to observe the specific behavior along with other aspects in a single setting.

Useful For Framing Hypothesis.

If the researcher takes the observation method as a technique of his research, then it is comparatively very easy for him/her to frame the hypothesis as there will be no experimental set up required and the respondents have to give responses which will be practiced before. So natural settings will be there and whatever the response will come, the researcher can observe those and accordingly those can be analyzed.

Greater Accuracy.

In the natural setting, the respondents are giving the response spontaneously. So, whatever the expected outcome of the research, that can be elicited in its fullest strength. If the researcher will be equipped enough, he/she can record all the possible natural responses of the individual and in that manner the purpose of the research will be fulfilled in its highest values and accuracy which cannot be elicited in the experimental situation.

A Universal Method

Observation method is a universal method because observing others behavior is the oldest and universally accepted technique for assessment. For many years, when there is very little scope of instrumentation, observation technique is highly reliable as it requires very few recording devices to assess the behavior of the individuals. In different other methods, observation is the tool for recording the responses, like in experiments also, we are observing the responses under controlled conditions.

Observation is the only appropriate tool for certain cases.

This is only applicable for certain cases, because some kinds of behavior cannot be elicited in the experimental situation, for example, persons' behavior after seeing some fearful objects, that fear and surprise cannot be elicited in the experimental situation or the desired response will not come as the individual is very much aware that he has to show fear responses which is different with the actual object perception in the real situation.

Independent of people's willingness to report.

Observation method is not dependent on the people's willingness, in the natural setting, people are totally unaware that he/she is being observed, so the spontaneous responses of the individuals can be recorded. In experimental settings, the respondents come after completion of their priorities and the researcher has to wait for them to come in the experimental settings, but in observation method, the recordings are being done in a real situation where the respondent is doing his/her everyday life activities, along with those events, the researcher can take the desired responses.

Limitations of Observation Method

Some of the occurrences may not be open to observation

There are some incidences that cannot be taken into an observation method, like the researcher has to inject some patient and keep him/her in a controlled condition for observing certain behavior. It is very true in case of any drug research, where direct observation is not at all possible.

Not all occurrences open to observation, can be observed when the observer is at hand.

There is a certain situation where the researcher cannot observe the behavior of the individual, like fits in Epilepsy, where the person can be observed when the scissure attachment occurs to him. In such cases, observation cannot be organized because the scissure attacks depend on certain conditions to happen.

Not all observations lend themselves to Observational study.

Some observations are very common and those may not be the objectives of the research. When the researcher is recording those responses along with the desired one, he/she has to eliminate those responses or they have to wait for the desired response to occur.

Faulty perception

Sometimes, direct observation becomes faulty in a sense that people may hide his original responses due to some personal reasons and give the fake response in the presence of others. In this

case, the observer may judge the person in a wrong way. As it is happening in a natural setting, and people are not aware of the fact that he/she is being judged, they may give responses according to their own judgement to the demand of the situation.

Personal bias of the observer

Sometimes, the observer may be biased about the response of the subject, and when the desired response is not happening, the researcher may anticipate the desired response of the individual.

Slow investigation

The investigation in the observation method is very slow in progress. The researcher has to take many sessions to get the desired response of the individual. In this way, the total research process is becoming very slow. If any quick and approximate result of the research is expected then the observation method is not the right one to be chosen.

Expensive

As the Observation method is very slow and it takes several sessions to conduct, it is very expensive in nature. For many individuals, many persons are to be deployed to get the result. The cost of the research sometimes also be a hindrance for taking this method in research.

Inadequate method

This is also termed as inadequate method because it is solely depending on the behavior of the individual in the natural settings, in many ways, the observation may be faulty, disguised, and like other techniques, it is solely not independent enough to carry on. In many cases, for this reason, other controlled techniques are employed to get the systematic results.

Difficulty in checking validity.

Every individual's behavior is unique in nature. It is not similar to another individual. So, what is true for one person may not be true for the other. In this way, the validity of the response is not being assured. It can be generalized with one person's behavior that it is the ideal behavior for everyone or the person will not behave in the same way the next time.

Importance of Observation Method

Observation is one of the most important research methods in social sciences and at the same time one of the most diverse. The term includes several types, techniques and approaches, which may be difficult to compare in terms of enactment and anticipated results; the choice must be adapted to the research problem and the scientific context. As a matter of fact, observation may be regarded as the basis of everyday social life for most people; we are diligent observers of behaviors and of the material surroundings. We watch, evaluate, draw conclusions and make comments on interactions and relations. However, observation raised to the rank of a scientific method should be carried out systematically, purposefully and on scientific grounds - even if curiosity and fascination may still be its very important components.

11.2 Survey Method: -

Purpose of Survey: -

The data are usually obtained through the use of standardized procedure to ensure that each respondent can answer the questions which can avoid any biased opinion which may have a detrimental effect on the outcome of the research.

The key to the success of any survey design is found not in the respondents or the incentives, but in its purpose. The purpose, the reason you are putting together your survey in the first place, is the driving force behind each question.

There should be only one main purpose for your survey, which should be supported by up to three goals. Goals are smaller, actionable objectives that help you get the most out of your data.

There are many good survey purposes, but some of the more common include:

- Identifying improvement opportunities
- Monitoring customer satisfaction
- Measuring market perception
- Collecting persona data about your existing customers

As you plan your survey, really think about what kind of information you are looking for and how you plan on using it once the results have been collected. Once you've decided on a primary purpose and a few supporting goals, it's time to think about how they tie into and influence your survey design.

Establishing Trust with Your Survey's Purpose

The purpose should be clearly shared with respondents, so they know how the information they give will be used. Often, this is just an extra line or two on the very first page of the survey.

It is important to be able to design your survey in such a way that it separates itself from those impostor surveys with dubious purposes.

No one likes being taken advantage of, and no one wants to answer questions if the information they provide is not going to be put to good use. Being up front and transparent about your larger purpose is an important first step toward earning your respondents' trust.

Establishing trust and offering clear directions will improve the quality of the data you collect, because respondents will be more likely to take the time out of their busy day to answer your questions.

Types of Survey: -

Survey can be divided into two broad categories-

Questionnaire

Interview.

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Survey can be divided into two broad categories-

Questionnaire

Interview.

11.3 Interviews

An interview is a survey research method where the researcher facilitates some sort of conversation with the research participant to gather useful information about the research subject. This conversation can happen physically as a face-to-face interview or virtually as a telephone interview or via video and audio-conferencing platforms.

During an interview, the researcher has the opportunity to connect personally with the research subject and establish some sort of relationship. This connection allows the interviewer (researcher) to gain more insight into the information provided by the research participant in the course of the conversation.

An interview can be structured, semi-structured, or unstructured. In a structured interview, the researcher strictly adheres to a sequence of premeditated questions throughout the conversation. This is also known as a standardized interview or a researcher-administered interview and it often results in quantitative research findings.

In a semi-structured interview, the researcher has a set of premeditated interview questions but he or she can veer off the existing interview sequence to get more answers and gain more clarity from the interviewee. The semi-structured interview method is flexible and allows the researcher to work outside the scope of the sequence while maintaining the basic interview framework.

Just as the name suggests, an unstructured interview is one that doesn't restrict the researcher to a set of premeditated questions or the interview sequence. Here, the researcher is allowed to leverage his or her knowledge and to creatively weave questions to help him or her to get useful information from the participant. This is why it is also called an in-depth interview.

Advantages of Interviews

Interviews, especially face-to-face interviews, allow you to capture non-verbal nuances that provide more context around the interviewee's responses. For instance, the interview can act in a certain way to suggest that he or she is uncomfortable with a particular question.

Interviews are more flexible as a method of survey research. With semi-structured and unstructured interviews, you can adjust the conversation sequence to suit prevailing circumstances.

Disadvantages of Interviews

It is expensive and time-consuming; especially when you have to interview large numbers of people.

It is subject to researcher bias which can affect the quality of data gathered at the end of the process.

5.2 Questionnaire Method: -

Questionnaire method describes a variety of instruments and techniques. It consists of a printed form containing a structured set of questions, all of which the subject is required to answer –usually in writing, sometimes orally as in public opinion.

Important Aspects of Questionnaire making: -

1. Answers can only be as good as your questions

When preparing a questionnaire, you need to think at length about the aspect of the subject you want to investigate, and go in knowing what you need to find out. Generalized questions, or being vague on the topic, won't give useful data, and so it's important to make sure the questions are actually asking relevant things. , if you wanted to find out about… the most popular aisles in Sainsbury's, asking questions about whether people prefer the supermarket to its rivals wouldn't get closer to this goal. Also, we all know it's the cereal aisle. So, know what you want to find out from the questionnaire.

2. The questions need to cover the areas in depth.

When getting opinions, it helps to be specific. Don't just ask 'did you like this', but follow it up with either a question asking for reasons why, or (if you're after a data set that can be analyzed more uniformly), ask them to rate on a number of scales why they did or didn't like it (i.e. "to what extent did the look of the webpage affect your opinion of it"). Not doing this will lead to closed answers (Did you like this? "no"), when it would be possible to get a much richer set of data from the participant. Whether you select an open question 'why' or a closed question (based on scales), depends on whether you are after purely quantitative data, or also want to include qualitative data as well.

3. Changing the questions mid-implementation taints your qualitative data

Halfway through a study, the results may start to show interesting trends that you'd want to find more about. Take caution when altering the questionnaire to investigate these trends. Adding more questions should be fine (except for the tired participants!), but when editing a question that already exists (i.e. from 'did you like the look and feel of the website' to 'did you like the look and feel of the first page of the website'), keep in mind that this will invalidate getting a quantitative response (i.e. '85% of people liked the look and feel of the first page of the website') from the entire dataset for that question, as the participants have been answering different questions.

4. Subjective answers need to be standardized

Remember, when asking whether something was 'easy' or 'hard', that answers to these questions are going to be subjective. People are likely to have a wide range of expectations about how a system should be, and a wide range of experience, and so will be judging on separate scales.

Dr Graham McAllister tells a story related to this. When doing usability testing, he asked 'did anyone have any problems with the program'… no reply. So he asked instead 'did anyone think that someone else may have problems with this program', and a whole host of replies were given from the same people.

Don't forget that pride can be a factor preventing people from saying they found tasks hard. Shifting the focus of the questions from the participant to the medium can help prevent this.

Also, terms such as 'often' or 'rarely' mean different things to different people. Try and replace them with specific terms 'every day', 'every week' etc.

5. The questions reflect your opinion

Because of the close controlled environment that a questionnaire creates (i.e. the participants can only answer the questions they have been asked) it is important to make sure that the researchers opinions do not show through the questions. For example, leading questions, which make it easier to answer one way than the other. I saw an advert recently, for some sort of Christian business, that asked 'Does god exist?' with tick boxes for 'Yes' 'Probably' and 'No'. This is a leading question – the only indefinite reply implies agreement. Where is 'probably not', 'neither agree or disagree' or 'don't know'? (Answer: not on an advert paid for by the church)

6. You need to give people a reason to participate

Before I go on with this list, I was wondering if you'd be happy to answer 25 questions on your opinions of southern English fauna and shrubbery. Please click here to fill it out.

Did I mention that filling out the survey gets you a £25 amazon voucher? Do you want that link again?

The point, as I'm sure you guessed, was that you need to offer an incentive for people to participate in your questionnaire, otherwise only people really interested in the subject will reply. Suitable incentives would be discounts, free products, a prize draw, or something related to the field you are investigating.

7. The data can be skewed towards extreme opinions

Failing to give a good enough incentive or no incentive at all, will end up with unrepresentative data – only people who feel so strongly about the subject matter to reply will bother to. In practice this will either be people who are really angry about it, or people who love it, and this will skew your data towards the extremes. To ensure you get a natural selection of participants, steps need to be taken, such as pre-selecting participants, or offering incentives as covered above.

Characteristics of a Good Questionnaire: -

- know what needs to be measured – Having a clear picture and understanding of what data needs to be collected contributes to the quality of data collection.
- Understand how to word/frame question – Words should be neutral and should not be leading. Whatever your opinion may be, own opinion should never be reflected in the questions. This is done both intentionally and unintentionally but should be taken care of.
- Emphasis on right word/phrase should be kept in mind – The language should be clear so that the required data can be received. This also makes the question and the requirement of survey easy to understand and thus help in getting a better response and answer.
- Define and qualify terms – This is most essential when a technical survey or a field specific survey is being done. If you think that the audience being surveyed might not know about some terms than they must be defined to get any proper response. This will increase the quality and decrease the bounce rate or number of questions which were left unanswered.
- Avoid double negatives or more than 1 negative word in question – Use of negative word has a psychological effect and can influence the answer.
- Sufficient or adequate alternatives should be provided – Available options should have the most expected answers.
- Multiple questions in question should be avoided – One question should have one answer. If more than one question needs to be asked than it should be made a separate question to improve clarity of questions.

- Word requiring emphasis should be emphasized – It helps in making a point and question clear.
- Options like good/bad/fair/average should be quantified through photographs or other mean – These are very vague terms and interpretations of these varies from person to person.
- Unwanted assumptions should be avoided – A survey is about getting factual data and assumptions should be avoided.

Types of Questionnaires: -

4 Types of Questionnaires

1. Online Questionnaire

An online questionnaire is a set of standardized questions that are put together and distributed via online channels. It gathers data from respondents through a set of questions that are administered via online data-collection platforms like Form plus.

Form plus is an easy-to-use tool that supports seamless online and offline data collection. It has a form builder that allows you to create different types of questionnaires for research. You can also find a variety of questionnaire templates that can be edited for unique research needs.

There are more than 30 form fields on Form plus that you can add to your questionnaire for data collection including text fields, numerical fields, and rating fields. Respondents can easily provide answers to questions created in the form of simple checkboxes or dropdown menus.

Form plus has multiple form-sharing options including email sharing, form embed, and direct social media sharing buttons. This means that respondents can receive online questionnaires via various mediums such as email, on your website, and on social media platforms.

Advantages of Online Questionnaires

- An online questionnaire helps you to save time during data collection.
- It is also a cost-effective method of data collection. You do not have to spend money on printing questionnaires or sharing the questionnaire with respondents physically.
- It allows respondents to complete the questionnaire when they want. This improves the questionnaire response rates.
- Since the questionnaire is created and administered online, it makes it easy for you to gather responses from a large pool of respondents.

Disadvantages of Online Questionnaires

The choice of your questionnaire distribution channel can affect questionnaire response rates.

1. The questionnaire sample size is limited to populations that have access to the internet. This can affect the variation of the data gathered.

2. Telephone Questionnaire

This is a method of collecting data from respondents via a telephone conversation. Here, the researcher places a direct call to different members of the survey sample and asks a set of predefined questions that are relevant to the research context.

This questionnaire method is best used when you have a small set of questions that can be responded to quickly. It also works for research contexts that require data from a small sample size or when members of the sample cannot complete a written or online questionnaire.

Advantages of Telephone Questionnaires

- It allows you to gather research data quickly.
- Telephone questionnaires tend to record higher response rates than other types of questionnaires.

Disadvantages of Telephone Questionnaires

- It is an expensive method of collecting data in research.

- Telephone questionnaires are time-consuming.
- Due to its direct conversation approach, respondents may refuse to give out as much information as they should for the research.

3. Paper Questionnaire

Paper questionnaires are the oldest and most common method of data collection in research. It is a sheet of paper with a set of predetermined questions that the members of the sample population respond to using a pencil or a pen.

Over time, the use of paper questionnaires has reduced significantly due to its multiple shortcomings. Apart from a steady decline in response rates, paper questionnaires are expensive to create and they also have a high risk of data loss and damage.

The best way to use a paper questionnaire is to pair it with online distribution channels that allow you to share your survey on paper. There are paper questionnaire creators that can be used to print your questionnaire or export it in Word and PDF formats.

Advantages of Paper Questionnaire

It can be used to collect research data from members of your research population who do not have access to other questionnaire types.

It is an effective method of data collection in market research.

Disadvantages of Paper Questionnaire

Paper questionnaires have a huge financial cost implication.

It can only be used when you have a small sample size that has physical proximity. If your research requires large data sets from a large audience, paper questionnaires may not be suitable for use.

11.4 Schedule

A schedule is a structure of a set of questions on a given topic which are asked by the interviewer or investigator personally. The order of questions, the language of the questions and the arrangement of parts of the schedule are not changed. However, the investigator can explain the questions if the respondent faces any difficulty. It contains direct questions as well as questions in tabular form.

Schedule include open-ended questions and close-ended questions. Open-ended questions allow the respondent considerable freedom in answering. However, questions are answered in details. Close-ended questions have to be answered by the respondent by choosing an answer from the set of answers given under a question just by ticking.

Following are the different types of schedules used by social scientists and anthropologists.

Village or community schedule: It is used by census researchers who collect general information on populations, occupations, etc.

Family or Household schedule: It gives full demographic details of households, the status of individuals, data on education, age, family relations, etc.

Opinion or attitude schedule: To schedule the views of the population regarding an issue.]

11.5 Case Study

The case study may be regarded as a special form of survey method except that one individual generally is studied at a time in detail. It is a method which aims to define the 'qualitatively unique' individual character of a human being. The case study requires a highly detailed study (often continued over a lengthy period) of the individual in the course of which all available data on this person are collected and processed (results of psychodiagnostics tests, creative performance etc.). The case study is used in idiographic personality research. The danger of the case study method is that it may confuse a striking coincidence with a true relationship.

Characteristics of Case Study

A case study is a research methodology that is commonly used in social sciences.

It is a research method commonly used in social sciences. Its methodology enables a researcher to analyze and investigate closely in a particular context. It is a very useful research strategy because it is empirical research that investigates a phenomenon within its context in the most realistic way possible.

A case study is a research strategy and an empirical inquiry that investigates a phenomenon within its real-life context.

They are based on an in-depth investigation of a single individual, group or event to explore the causes of the underlying principles. It is an exploratory and descriptive analysis in relation to a person, group or event.

A case study is a descriptive and exploratory analysis of a person, group or event.

Evidence of qualitative form based on diversified sources of evidence and facilitates the later development of theories or propositions. Ethnography uses this method and can be commonly found in communication case studies. Ethnography is the description, interpretation and analysis of a culture or social group, through field research in the natural environment of the group studied. The main method of ethnographic research is through observation where the researcher observes the participants over an extended period of time within the participants' own environment.

A case study research can be single or multiple

Case study may be single or multiple according to the purpose of research. More than one person can be taken for case study. Different aspects of the same individual also can be considered for the case study.

Case studies are analysis of persons, groups, events, decisions, periods, policies, institutions or other systems that are studied holistically by one or more methods.

Types of Case Study

- Explanatory
- Exploratory
- Multiple
- Intrinsic
- Instrumental

Explanatory Case Study

Explanatory case studies should consist of an accurate description of the facts of a case, considerations of alternative explanations, and a conclusion based on credible explanations that are congruent with the facts.

Exploratory Case Study

The exploratory case study investigates distinct phenomena characterized by a lack of detailed preliminary research, especially formulated hypotheses that can be tested, and/or by a specific research environment that limits the choice of methodology.

Multiple Case Study

Multiple-case design, or collective case design, refers to case study research in which several instrumental bounded cases are selected to develop a more in-depth understanding of the phenomena than a single case can provide.

Intrinsic Case Study

An intrinsic case study is the study of a case (e.g.,  person, specific group, occupation, department, organization) where the case itself is of primary interest in the exploration.

Instrumental Case Study

In an instrumental case study, the case is secondary to the exploration of a specific issue, building theory or redrawing generalizations.

Types of Subjects of Case Study

- Person
- Group
- Location
- Organization
- Event

Significance of Case Study

- Case study helps in formulating hypothesis
- It helps in framing questionnaire or schedule
- It can enlarge the personal experience of the researcher.
- Since the case study covers the entire life of the unit, it is inductive and intensive in nature.

Importance of Case Study

Like children in a sweetshop, researchers are often spoilt for choice when it comes to determining which tools to use to address a research question. This includes an array of quantitative and qualitative research tools, ranging from desk-based literature reviews to in-depth case studies. Given the time and cost restraints of many projects the more in-depth methods are often perceived as time consuming and frequently dismissed. Based on my experience, here are my thoughts on the value and challenges of including case studies in social research.

Case studies are an in-depth investigation of one particular individual, group, time-period or event. They encompass a range of qualitative and quantitative research tools to investigate underlying principles of an occurrence within a real-life context.

The case study has been used by researchers for a long time and has been applied in different disciplines. It has been widely used in social sciences as a qualitative research method to investigate contemporary real-life situations and has provided a foundation of application of ideas and extension of methods.

It has been defined as an empirical inquiry that examines a contemporary phenomenon within the context of its real life. However, some people have disagreed with this research method arguing that the study of a small number of cases does not offer enough ground to establish reliability or generality of findings. Others have argued that a case study is only used when applied as an exploratory tool, yet most researchers continue using it successfully in carefully planned studies that concern real-life situations, problems, and issues.

Case studies will more often than not appear in journals or professional conferences instead of popular works. A case study may be an individual, organization, action, event existing in a given time and place. For instance, there are case studies of individuals and clinical practices. When the

term "case" is used in a claim, an argument, or a proposition; it can be the subject of a litany of research methods. A case study will involve quantitative and qualitative methods of research.

Researchers, on the other hand, are always spoilt for choice when they are determining the tools to use in dealing with their research question. This is because there is an array of both qualitative and quantitative research tools. They can be based on in-depth case studies or desk-based literature reviews. When using case study, the researcher will get an in-depth investigation of a phenomenon, individual, or an event. They help in investigating and understanding the underlying principles in an occurrence within a real-life context.

Limitations of Case study

Challenges

Wider relevance.

A common criticism of the case study is that the findings can't be generalized. However, we've found when they're part of broader research a case study can look to explore common problems in greater detail. In the district heating research, we used the broader background research to identify areas of particular interest and then used the case studies to further investigate the causes and impacts. Furthermore, the case study participants were carefully selected to ensure a good spread of locations, technologies and management arrangements.

Permissions.

In social research, maintaining participants' anonymity helps to provide a true picture of what is happening. Studies have shown that participants are more open with the research team in situations where they are confident that their identity will not be disclosed1. However, maintaining anonymity can be challenging given the detailed nature of the case study. For in-depth case studies it may be appropriate to seek confirmation that the lead participant agrees that the material is anonymous and accurate, enabling confidence on both the part of the researcher and the participant. However, the process of gaining permission can take time and result in additional iterations of the published research.

Time.

Case studies can be time consuming. Planning multiple interviews, waiting to receive data and possibly coordinating focus groups can take a considerable amount of time. Especially if you are relying on a case study participant who is often acting in a voluntary capacity and busy fulfilling their day-to-day tasks. Yet these issues can be overcome by offering participants incentives, outlining what is required from the participant at the outset and sending notification of deadlines well in advance.

I believe that case studies enable a researcher to gain a more detailed, unbiased understanding of a complex situation, through the use of a range of research tools. This real-life view, places the research organization in a stronger position to confidently recommend practical solutions to challenges. While there are some difficulties associated with the delivery of case studies, these can be overcome through forward planning, background research and informed participant selection.

11.6 Ethnography

Ethnographic research is perhaps the most common applicable type of qualitative research method in psychology and medicine. In ethnography studies, the researcher immerses himself in the environment of participants to understand the cultures, challenges, motivations, and topics that arise between them by investigating the environment directly. This type of research method can last for a few days to a few years because it involves in-depth monitoring and data collection based on these foundations. For this reason, the findings of the current study stimuli the researchers in psychology and medicine to conduct studies by applying ethnographic research method to investigate the common cultural patterns: language, thinking, beliefs, and behavior for groups of addicts, the bullies and their bullies, hospitalized psychiatric patients, psychiatric nursing groups,

psychologists, counselors and psychotherapists, elderly residents of care homes, abused persons, orphans, persons with special needs, groups of gifted students in gifted schools and centers, and family with special needs children. The ethnographic approach is a very important method in medicine to investigate the health case of the patients with chronic diseases, such as heart diseases, cancer, diabetes, blood pressure, and others. And examine the effectiveness of the treatment plan and take a decision to continue this plan, or change it, in the treatment of a particular disease group. As well as detection of the side effects of drugs and treatment plan for certain groups of patients, and learning about the common culture of pregnant women about the process of pregnancy and childbirth.

Keywords

Descriptive studies, Exploratory studies, Structured observation, Unstructured observation, Controlled observation, Uncontrolled observation, Participant observation, non-participant observation, Exploratory case studies, Explanatory case studies, Intrinsic case studies, Instrumental case studies.

SelfAssessment

1. There are five types of subjects in Case Study.

A. True

B. False

2. We have six types of Case Study

A. True

B. False

3. There are six types of Observation

A. True

B. False

4. Case Study does not help in formulating hypotheses

A. True

B. False

5. Observation is an inadequate method

A. True

B. False

6. All are the types of Observation method except-------

a. Structured Observation

b. Unstructured Observation

c. Controlled Observation

d. Correlational Observation

7. Uncontrolled Observation is best for ------- studies.

a. Descriptive

b. Exploratory

c. Correlational

d. None of them

8. Observation can be scientific when it is carried out------

a. Randomly

b. Haphazardly

c. Systematically

d. None of them

9. Case Study can enlarge the personal experience of the--------
a. Researchers
b. Statisticians
c. Respondents
d. None of them

10. Case Studies are based on ---------
a. Orientation
b. In-depth investigation
c. Reaction formation
d. None of them

11. Case Study is a ------- rather than an incident.
a. Correlation
b. Relation
c. Process
d. None of them

12. Observation is the ------- method.
a. Simplest
b. Toughest
c. Strongest
d. None of them

13. Observation methods may have --------- perception.
a. Correct
b. Faulty
c. Mixed
d. None of them

14. In ----------method, we are not dependent on people's willingness to report.
a. Experimental
b. Statistical
c. Case Study
d. Observation

15. In the Observation method, it is very ------- check the validity.
a. Easy
b. Difficult
c. Smooth
d. None of them

Answers for Self Assessment

1A, 2B, 3A, 4B, 5A, 6D, 7B, 8C, 9A, 10B, 11C, 12A, 13B, 14D, 15B.

Review Questions

1. What is an Observation method? Briefly describe its characteristics.
2. Elaborate different types of Observation methods.
3. What are the advantages of the Observation method?
4. What is the Case Study method? Briefly narrate its characteristics.
5. Briefly state different types of Case Study.
6. What are the characteristics of the Observation method?
7. What is the significance of Case Study?
8. What are the limitations of the Observation method?
9. What are the limitations of Case Study?
10. What is the importance of Case Study in Social Research?

Further Readings

-  The Practice of Social Research by Earl, R. Babbie-13th ed. Wadsworth Publishing Co.inc.2011
-  Methods of Social Research by Paul,K.Hatt& William, J. Goode. Surjeet Publication. 2018.

Unit 12:Quantitative Data Analysis

Contents

Objectives

Introduction

12.1. Descriptive statistics

It help us summarize data so they can be easily comprehended. For example, suppose we administered a test to all 362 freshmen enrolled in a university. An unordered list of the scores would be difficult to process mentally. However, if we prepare a frequency distribution such as that in Table 1, we can easily see how the scores are distributed. For example, the figure clearly indicates that a majority had scores of 14 through 16, with a scattering above and below these levels.

Table 1 *Frequency distribution with percentages*

Score (*X*)	Frequency (*f*)	Percentage
20	5	1.4
19	9	2.5
18	24	6.6
17	35	9.7
16	61	16.9
15	99	27.3
14	68	18.8
13	29	8.0
12	21	5.8
11	11	3.0
total	362	100.0

The frequencies in Table 1 are descriptive statistics; they describe how many students earned each score. The percentages are also descriptive; they describe how many *students per one hundred* had each score. These and other descriptive statistics such as averages are described in this part of the book. Now let's suppose that for the sake of efficiency, instead of testing all 362 freshmen, we sampled at random (by drawing names out of a hat) only 100 to be tested. Would we obtain exactly the same results as we would if we tested all freshmen? In all likelihood, no. As you probably recall from Topics 17 through 19, random sampling produces random errors called *sampling errors.*

12.2. Inferential statistics

It help us draw inferences about the effects of sampling errors on our results. They are defined as statistical techniques techniques that help us generalize from samples to the populations from which the samples were drawn. One type of inferential statistic you may already be familiar with is a *margin of error.* When reporting the results of public opinion polls in the media, reporters frequently cite margins of error to help us interpret results in light of sampling error. For example, a recent poll indicated that approval of the president was at 52% with a margin of error of ±2 (i.e., plus/minus 2) percentage points. This means we can be highly confident that the level of approval in the population is between 50%

and 54% (that is, within two points of the 52% observed in the sample). An important family of inferential statistics consists of *significance tests,* which help us decide whether differences that we observe (such as differences in the reading achievement of samples of boys and girls) are reliable. The next topic will help you understand the general purpose of significance testing, and in later sections, we will consider three popular tests of significance. Because inferential statistics help us evaluate results in light of sampling errors, it follows that if we do *not* sample, we do *not* need inferential statistics. For example, if we conduct a *census* (a study in which all members of a population are included), the descriptive values that we obtain such as percentages are values that are free of sampling errors.

We distinguish between values obtained from a sample and values obtained from a census by using the terms **parameters** for values from a census and **statistics** for values from studies in which samples were examined. Thus, percentages, averages, and frequencies are classified as parameters when they result from a census, but they are classified as statistics when they are based on a sample. Remember the first letters: Samples yield Statistics, and Populations yield Parameters.

12.3. Tools for Hypothesis Testing

12.3.1. Scales of Measurement

There are four scales (or levels) at which we measure. The lowest level is the **nominal** scale.This may be thought of as the "naming" level. For example, when we ask subjects to name theirmarital status, they will respond with *words*—not numbers—that describe their status such as "married,""single," "divorced," etc. Notice that nominal data do not put subjects in any particular order. There is no logical basis for saying that one category such as "single" is higher or lower than any other. The next level is **ordinal.** At this level, we put subjects in order from high to low. For instance, an employer might rank order applicants for a job on their professional appearance. Traditionally, we give a rank of 1 to the subject who is highest, 2 to the next highest, and so on. It is important to note that ranks do not tell us by how much subjects differ. If we are told that Janet hasa rank of 1 and Frank has a rank of 2, we do not know if Janet's appearance is greatly superior to Frank's or only slightly superior. To measure the *amount* of difference among subjects, we use the next levels of measurement. Measurements at the **interval** and **ratio** levels have equal distances among the scores they yield. For example, when we say that Jill weighs120 pounds and Sally weighs 130 pounds, we know by *how much* the two subjects differ. Also, note that a 10-pound difference represents the same amount regardless of where we are on the scale. For instance, the difference between 120 and 130 pounds is the same as the difference between220 and 230 pounds. The ratio scale is at a higher level than the interval scale because the ratio has an absolute zero point that we know how

to measure. Thus, *weight*s an example of the ratio scale because it has an absolute zero that we can measure.

The interval scale, while having equal intervals like the ratio scale, does not have an absolute zero. The most common examples of interval scales are scores obtained using objective tests such as multiple-choice tests of achievement. It is widely assumed that each multiple-choice test item measures a single point's worth of the trait being measured and that all points are equal to all other points—making it an interval scale (just as all pounds are equal to all other pounds of weight). However, such tests do not measure at the ratio level because the zero on such tests is arbitrary— not absolute. To see this, consider someone who gets a zero on a multiple-choice final examination. Does the zero mean that the student has absolutely no knowledge of or skills in the subject area? Probably not. He or she probably has some knowledge of simple facts, definitions, and concepts, but the test was not designed to measure at the skill level at which the student is operating. Thus, a score of zero indicates only that the student knows nothing *on that test*—not that the student has zero knowledge of the content domain.

12.3.2. Chi Square

Suppose we drew at random a sample of 200 members of a professional association of sociologists and asked them whether they were in favour of a proposed change to their bylaws. The results are shown in Table 1. But do these *observed results* reflect the *true results* that we would have obtained if we had questioned the entire population?

Remember that the null hypothesis (see Topic 38) says that the observed difference was created by random sampling errors; that is, in the population, the true difference is zero. Put another way, the observed difference *(n* = 120 vs. *n* = 80) is an *illusion* created by chance errors.

The usual test of the null hypothesis when we are considering frequencies (that is, number ofcases or n*)* is **chi square,** whose symbol is: It turns out that after doing some computations,which are beyond the scope of this book, for the data in Table 1, the results are: What does this mean for a consumer of research who sees this in a report? The values of chi square and degrees of freedom *(df)* were calculated solely to obtain the probability that the null hypothesis is correct. That is, chi square and degrees of freedom are *not* descriptive statistics that you should attempt to interpret. Rather, think of them as sub-steps in the mathematical procedure for obtaining the value of *p.* Thus, the consumer of research should concentrate on the fact that *p* is *less than* .05. As you probably recall from Topic 38, when the probability *(p)* that the null hypothesis is correct is .05 or less, we reject the null hypothesis.

(Remember, when the probability that something is true is less than 5 in 100—a low probability— conventional wisdom suggests that we should reject it as being true.) Thus, the difference we observe in Table 1 was probably not created by random sampling errors; therefore, we can say that the difference is *statistically significant* at the .05 level. So far, we have concluded that the difference we observed in the sample was *probably not* created by sampling errors. So where did the difference come from? Two possibilities remain: 1. Perhaps there was a bias in procedures such as the person asking the question in the survey leading the respondents by talking enthusiastically about the proposed change in the bylaws. If we are convinced that adequate measures were taken to prevent procedural bias, we are left with only the next possibility as a viable explanation.

2. Perhaps the *population* of sociologists is, in fact, in favor of the proposed change, andthis fact is correctly identified by studying the random sample. Now let's consider some results from a survey in which the null hypothesis was *not* rejected.

The null hypothesis says that this *set of differences* was created by random sampling errors; in other words, it says that there is no true difference in the population; we have observed a difference only because of sampling errors.

In this topic, we have considered the use of chi square in a *univariate analysis* in which weclassify each subject in only one way (such as which candidate each prefers). In the next topic, we'll consider its use in *bivariate analysis* in which we classify each subject in two ways (such as which candidate each prefers *and* the gender of each) in order to examine a relationship between the two.

12.3.3. Shapes of Distributions

One way to describe quantitative data is to prepare a *frequency distribution*. It is easier to see the shape of the distribution if we prepare a figure called a **frequency polygon.** This figure is a frequency polygon for the data:

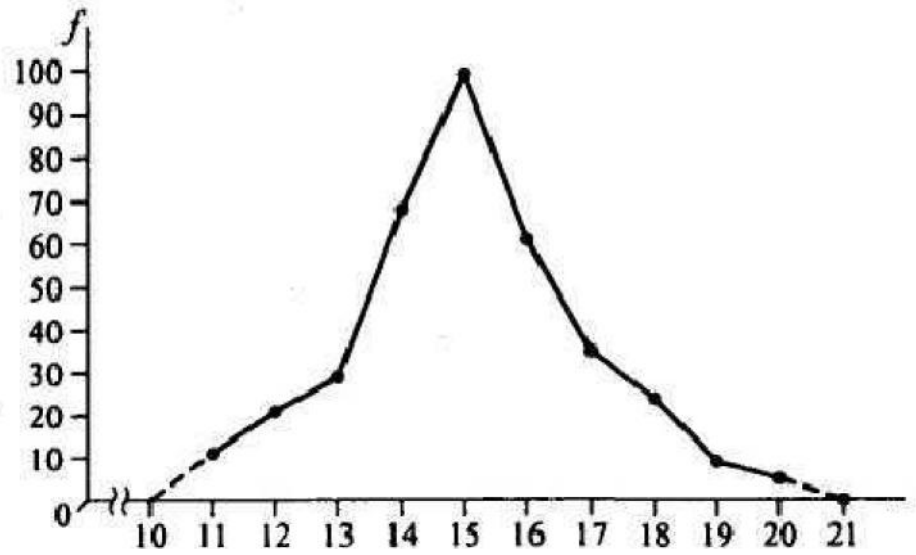


Figure 1 *Frequency polygon*

A frequency polygon is easy to read. For example, a score of 20 has a frequency (/) of *5,* which is why the curve is low at a score of 20. A score of 15 has a frequency of 99, which is why the curve is high at 15. Notice that the curve in Figure 1 is fairly symmetrical with a high point in the middle and dropping off on the right and left. When very large samples are used, the curve often takes on an even smoother shape, such as the one shown in

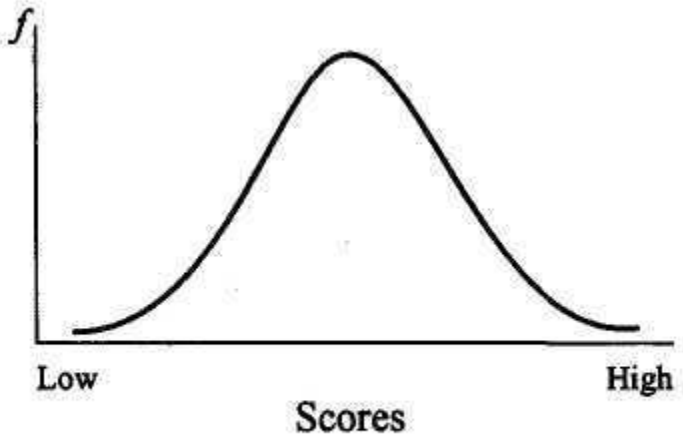


Figure 2 *The normal curve*

The smooth, bell-shaped curve 2 has a special name; it is the **normal curve.** As the name "normal" suggests, it is the common shape that is regularly observed. Many things in nature are normally distributed—the weights of grains of sand on a beach, the heights of women (or men), the annual amounts of rainfall in most areas, and so on. The list is almost limitless. Many social and behavioural scientists also believe that mental traits of humans probably are also normally distributed.

Some distributions are **skewed**—that is, they have a tail to the left or right. shows a distribution that is *skewed to the right* (that is , the tail is to the right); it is said to have a **positiveskew.** An example of a distribution with a positive skew is income. Most people earn relatively small amounts, so the curve is high on the left. Small numbers of rich and very rich people create a tail to the right.

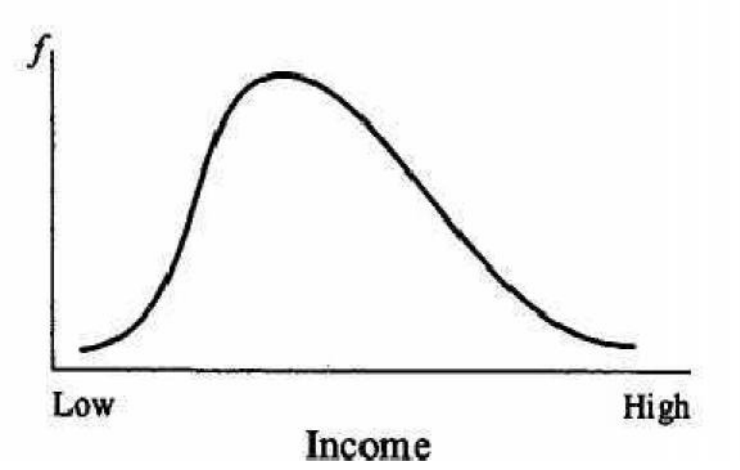


Figure 3 *A distribution with a positive skew*

Figure 4 is *skewed to the left;* it has a **negative skew.** We would get a negative skew, for example,if we administered a test of basic math skills to a large sample of college seniors. Most would do very well and get almost perfect scores, but a small scattering will get lower scores for a variety of reasons such as

misunderstanding the directions for marking their answers, not feeling well the day the test was administered, and so on.

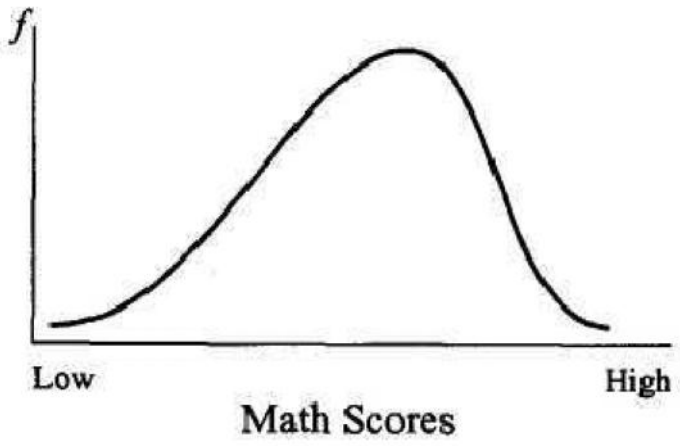


Figure 4 *A distribution with a negative skew*

While there are other shapes, the three shown here are the ones you are most likely to encounter. Whether a distribution is basically normal or skewed affects how quantitative data at the interval and ratio levels are analyzed, which we will consider in the next topic.

12.3.4. THE MEAN MEDIAN, AND MODE

The most frequently used average is the **mean,** which is the *balance point* in a distribution.

Its computation is simple—just sum (add up) the scores and divide by the number of scores. The most common symbol for the mean in academic journals is *M* (for the mean of a population) or *m* (for the mean of a sample). The symbol preferred by statisticians is *X* which is pronounced "X-bar." Because the mean is very frequently used as the average, let's consider its *formal definition,* which is *the value around which the deviations sum to zero.*

Note that if you take *any set of scores,* compute their mean, the sum of the deviations will always equal zero.1 Considering the formal definition, you can see why we also informally define the mean as the *balance point* in a distribution. The positive and negative deviations *balance* each other out.

A major drawback of the mean is that it is drawn in the direction of extreme scores. Consider the following two sets of scores and their means.

Scores for Group A: 1,1,1, 2, 3, 6, 7, 8, 8

M-4.ll

Scores for Group B: 1, 2, 2, 3, 4, 7, 9, 25, 32

Mf=9.44

Notice that in both sets there are nine scores and the two distributions are very similar except for the scores of 25 and 32 in Group B, which are much higher than the others and, thus, create a skewed distribution.

Notice that the two very high scores have greatly pulled up the mean for Group

B; in fact, the mean for Group B is more than twice as high as the mean for Group A because of the two high scores.

When a distribution is highly skewed, we use a different average, the **median,** which is defined as the *middle score.* To get an *approximate median,* put the scores in order from low to high as they are for Groups A and B above, and then count to the middle. Since there are nine scores in Group A, the median (middle score) is 3 (five scores up from the bottom). For Group B, the median (middle score) is 4 (five scores up from the bottom), which is more representative of the center of this skewed distribution than the mean, which we noted was 9.44. Thus, one use of the median is to describe the average of skewed distributions. Another use is to describe the average of ordinal data, A third average, the **mode,** is simply the *most frequently occurring score.* For Group B, there aremore scores of 2 than any other score; thus, 2 is the mode. The mode is sometimes used in informal reporting but is very seldom used in formal reports of research.Because there is more than one type of average, it is vague to make a statement such as, "The *average* is 4.11." Rather, we should indicate the specific type of average being reported with statements such as, "The *mean* is 4.11."+ score for Group B, and the differences among the scores for Group B (0 vs. 5 vs. 7 vs. 10 vs. 15, scores for Group A (1 vs. 1 vs. 1 vs. 1 vs. 2, etc.) etc.).

12.3.5. THE PEARSON CORRELATION COEFFICIENT

When we want to examine the relationship between two quantitative sets of scores (at the interval or ratio levels), we compute a correlation coefficient. The most widely used coefficient is the **Pearson product-moment correlation coefficient,** whose symbol is *r.* It is usually called simply **Pearson's *r.*** As you can see, theemployment test scores put subjects in *roughly*the same order as the ratings by supervisors. Inother words, those who had high employment testscores (such as Joe and Jane) tended to have high supervisors' ratings, *and* those who had low test scores (such as John and Jake) tended to have lowsupervisors' ratings. This illustrates what wemean by a **direct relationship** (also called a **positiverelationship).**

Being less than perfect, its actual value is .89. As you can see in Figure 1, this value indicates a strong, direct relationship. In an **inverse** relationship (also called a **negative relationship),** those who are high on one variable are low on the other. Such a relationship exists between the scores. Those who are high on self-concept (such as Joe and Jane) are low on depression while those who are low on self-concept (such as Jake and John) are high on depression. However, the relationship is not perfect.

Coefficient of determination, whose symbol is r2,which indicates how to compute it—simplysquare *r.* Thus, for an *r* of .50, r2 equals .25. If we multiply .25 by 100, we get 25%. What does this mean? Simply this: A Pearson *r* of .50 is 25% better than a Pearson *r* of 0.00. Table 3 shows selected values of *r, r1,* and the percentages you should think about when interpreting an *r.*'

12.3.6. THE *t* TEST

Suppose we have a *research hypothesis* that says "homicide investigators who take a shortcourse on the causes of HIV will be less fearful of the disease than investigators who have not taken the course," and test it by conducting an experiment in which a random sample of investigators is assigned to take the course and another random sample is designated as the control group.1 Let's suppose that at the end of the experiment the experimental group gets a mean of 16.61 on a fear of HIV scale and the control group gets a mean of 29.67 (where the higher the score, the greater the fear of HIV). These means support our research hypothesis. But can we be certain that our research hypothesis is correct? If you've been reading the topics on statistics in order from the beginning, you already know that the answer is "no" because of the **null hypothesis,** which says that there is no *true* difference between the means; that is, the difference was created merely by the chance errors created by random sampling. (These errors are known as *sampling errors* Put another way unrepresentative groups may have been assigned to the two conditions quite at random. The *t* test is often used to test the null hypothesis regarding the observed difference between two means.2 For the example we are considering, a series of computations (which are beyond the scope of this book) would be performed to obtain a value of *t* (which, in this case, is 5.38) and a value of degrees of freedom (which, in this case, is *df*= 179). These values are not of any special interest to us except that they are used to get the *probability (p)* that the null hypothesis is true. In this particular case, *p* is less than .05. Thus, in a research report, you may read a statement such as this: The difference between the means is statistically significant *(t* = 5.38, *df*= 179,*p*<.05) As you know from Topic 38, the term *statistically significant* indicates that the null hypothesis hasbeen rejected. You should recall that when theprobability that the null hypothesis is true is .05 orless (such as .01 or .001), we reject the null hypothesis.(When something is unlikely to be true because it has a low probability of being true, wereject it.)

Having rejected the null hypothesis, we are in a position to assert that our research hypothesis probably is true (assuming no procedural bias was allowed to affect the results, such as testing the control group immediately after a major news story on a famous person with AIDS, while testing the experimental group at an earlier time). What leads a *t* test to give us a low probability?

Three things:

1. *Sample size.* The larger the sample, the less likely that an observed difference is due to sampling errors. (You should recall from the sections

on sampling that larger samples provide more precise information.) Thus, when the sample is large, we are more likely to reject the null hypothesis than when the sample is small.

2. *The size of the difference between means.* The larger the difference, the less likelythat the difference is due to sampling errors. Thus, when the difference betweenthe means is large, we are more likely toreject the null hypothesis than when thedifference is small.
3. *The amount of variation in the population.* You should recall from Topic 22 thatwhen a population is very heterogeneous(has much variability) there is more potentialfor sampling error. Thus, when there is little variation (as indicated by the standard deviations of the sample), we aremore likely to reject the null hypothesisthan when there is much variation. A special type of *t* test is also applied to correlation coefficients. Suppose we drew a random sample of 50 students and correlated their hand size with their GPAs and got an *r* of .19.

The null hypothesis says that the *true* correlation in the population is 0.00—that we got 0.19 merely as the result of sampling errors. For this example, the *t* test indicates that $p > .05$. Since the probability that the null hypothesis is true is greater than 5 in 100, we do *not* reject the null hypothesis; we have a statistically insignificant correlation coefficient. (In other words, for $n = 50$, an r of .19 is not significantly different from an *r* of 0.00.) When reporting the results of the *t* test for the significance of a correlation coefficient, it is conventional *not* to mention the value of *t.* Rather, researchers usually indicate only whether or not the correlation is significant at a given probability level.

12.. Review Questions

1. What do you mean by quantitative analysis?
2. Explain inferential statistics?
3. What would you understand by the Pearson coefficient correlation?
4. **Short note on t- test?**
5. Write a short note on chi-square test?

Unit 13 Qualitative Data Analysis

Contents

Objectives

This unit will enable you to:

Know about different types of qualitative data analysis;

Understand role of content analysis;

Understand how to apply discourses analysis;

Acquire knowledge about grounded theory;

Introduction

Qualitative data might be observed and recorded.Some qualitative researchers put primary energy into data collection for weeks, months, or even years and then retire from the field to "work over their notes." We believe this is a big mistake. It rules out the possibility of collecting new data to fill in gaps or to test new hypotheses that emerge during analysis. It discourages the formulation of rival hypotheses that question a field-worker's routine assumption. And it makes analysis into a giant, sometimes overwhelming, task that frustrates the researcher and reduces the quality of the work produced.

This is non-numerical data in nature which collected through methods of observations, one to one interviewand conducting focus groups.In other words, we can say that Qualitative data refers to

non-numeric information such as interview transcripts, notes, video and audio recordings, images and text documents. Thus, qualitative data is typically generated through:

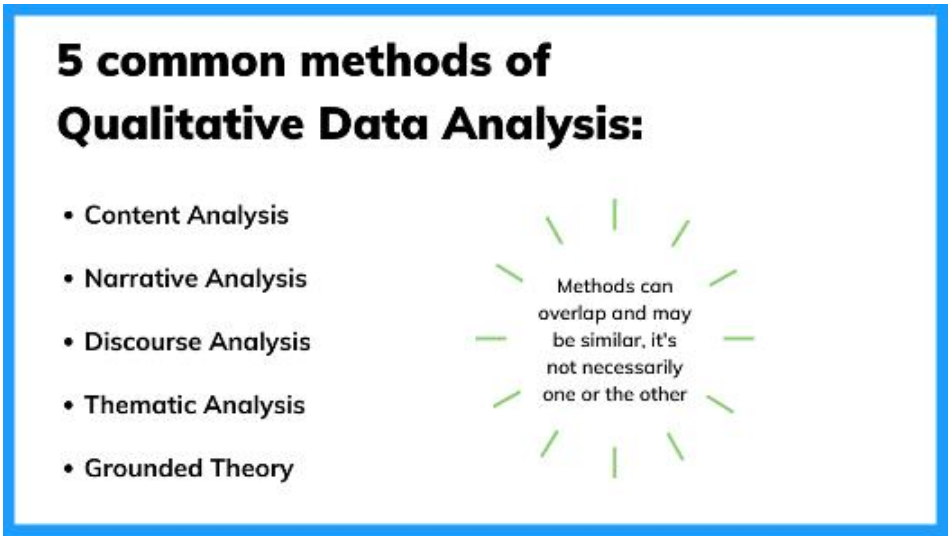
- Interview transcripts
- Surveys with open-ended questions
- Contact center transcripts
- Texts and documents
- Audio and video recordings
- Observational notes

As compared to quantitative data, which has been captured structured information, qualitative data is unstructured and has more depth. It can also be answered our questions and could help formulate hypotheses and build understanding.

There is not a single way to analysis data. There are different method and we choose based on nature and objective of the study.

Commonly there are Six type of qualitative data analysis.

1. Content analysis
2. Narrative analysis
3. Discourse analysis
4. Framework analysis
5. Grounded analysis
6. Phenomenology or heuristic analysis



13.1. Content analysis

It refers to the process of categorizing verbal or behavioural data to classify, summarize and tabulate the data.Other analysis techniques may fit within the broad scope of content analysis. Thematic analysis is a part of the content analysis. Content analysis is used to identify the patterns

that emerge from text by grouping content into words, concepts, and themes. Content analysis is useful to quantify the relationship between all of the grouped content.

13.2. Narrative analysis

This method involves the reformulation of stories presented by respondents taking into account context of each case and different experiences of each respondent. In other words, narrative analysis is the revision of primary qualitative data by researcher and focuses o the stories which peopletell and the language they use to make sense of them. It is particularly useful for getting a deep understanding of customers' perspectives on a specific issue. A narrative analysis might enable us to summarize the outcomes of a focused case study.

13.3. Discourse analysis

A method of analysis of naturally occurring talk and all types of written text.It is used to get a through understanding of the political, cultural and power dynamics that exist in specific situations. The focus here is on the way people express themselves in different social contexts. It is commonly used by brand strategists who hope to understand why a group of people feel the way they do about a brand or product.

Discourse is simply a fancy word for written or spoken language or debate. So, discourse analysis is all about analysing language within its social context. In other words, analysing language – such as a conversation, a speech, etc – within the culture and society it takes place in. For example, you could analyse how a janitor speaks to a CEO, or how politicians speak about terrorism.

To truly understand these conversations or speeches, the culture and history of those involved in the communication is important. For example, a janitor might speak more casually with a CEO in a company that emphasises equality among workers. Similarly, a politician might speak more about terrorism if there was a recent terrorist incident in the country.

So, as you can see, by using discourse analysis, you can identify how culture, history or power dynamics (to name a few) have an effect on the way concepts are spoken about. So, if your research aims and objectives involve understanding culture or power dynamics, discourse analysis can be a powerful method.

Because there are many social influences in how we speak to each other, the potential use of discourse analysis is vast. Of course, this also means it's important to have a very specific research question (or questions) in mind when analysing your data and looking for patterns and themes, or you might land up going down a winding rabbit hole.

Discourse analysis can also be very time consuming as you need to sample the data to the point of saturation – in other words, until no new information and insights emerge. But this is, of course, part of what makes discourse analysis such a powerful technique. So, keep these factors in mind when considering this QDA method.

13.4. Framework analysis

This is more advanced method that consists of several stages such as familiarization, identifying a thematic framework, coding, charting, mapping and interpretation.

13.5. Grounded theory

This method of qualitative data analysis starts with an analysis of a single case to formulate a theory then; additional cases are examined to see if they contribute to the theory. Grounded theory is useful approach when little is known about a subject. It starts by formulating a theory around a single data case. This means that the theory is "grounded". It's based on actual data and not entirely speculative. Then additional cases can be examined to see if they are relevant and can add to the original theory.

Grounded Theory is powerful qualitative analysis method where the intention is to create a new theory (or theories) using the data at hand, through a series of "tests" and "revisions." For example, you could try to develop a theory about what factors influence students to read watch a YouTube video about qualitative analysis… The important thing with grounded theory is that you go into the analysis with an open mind and let the data speak for itself – rather than dragging existing hypotheses or theories into your analysis. In other words, your analysis must develop from the ground up (hence the name). In Grounded Theory, you start with a general overarching question about a given population – for example, graduate students. Then you begin to analyse a small sample – for example, five graduate students in a department at a university. Ideally, this sample should be reasonably representative of the broader population. You'd then interview these students to identify what factors lead them to watch the video.

After analysing the interview data, a general hypothesis or pattern could emerge. For example, you might notice that graduate students are more likely to read a post about qualitative methods if they are just starting on their dissertation journey, or if they have an upcoming test about research methods.

From here, you'll look for another small sample – for example, five more graduate students in a different department – and see whether this pattern or this hypothesis holds true for them. If not, you'll look for commonalities and adapt your theory accordingly. As this process continues, the theory develops. What's important with grounded theory is that the theory develops from the data – not from some preconceived idea. You need to let the data speak for itself.

So, what are the drawbacks of grounded theory? Well, some argue that there's a tricky circularity to Grounded Theory. For it to work, in principle, you should know as little as possible regarding the research question and population, so that you reduce

the bias in your interpretation. However, in many circumstances, it's also thought to be unwise to approach a research question without knowledge of the current literature. In other words, it's a bit of a "chicken or the egg" situation.

Regardless, grounded theory remains a popular (and powerful) option. Naturally, it's a very useful method when you're researching a topic that is completely new or has very little existing research about it, as it allows you to start from scratch and work your way from the ground up.

Unit 14: Ethics in Psychological Research

Contents

Objectives

After completion of this unit, the students will be able to:

- understand about different components of Ethical Issues of Psychological Research
- know about different facets of Plagiarism
- familiarize with the concept of Using APA Style.

Introduction

Social responsibility is an ethical theory in which individuals are accountable for fulfilling their civic duty, and the actions of an individual must benefit the whole of society. In this way, there must be a balance between economic growth and the welfare of society and the environment. If this equilibrium is maintained, then social responsibility is accomplished.

The theory of social responsibility is built on a system of ethics, in which decisions and actions must be ethically validated before proceeding. If the action or decision causes harm to society or the environment, then it would be considered to be socially irresponsible.

The theory of social responsibility and ethics applies in both individual and group capacities. It should be incorporated into daily actions/decisions, particularly ones that will have an effect on other persons and/or the environment. In the larger, group capacity, a code of social responsibility and ethics is applied within said group as well as during interactions with another group or an individual.

Responsible conduct of research speaks to the professional responsibility of scientists and researchers regarding the best practices in their field for conducting research. These responsibilities include, but are not limited to, rigorous study design, accurate data collection, secure, backed-up data storage, accurate and comprehensive data analysis and reporting, and responsible and fair allocation of credit. In addition to these internally-focused responsibilities are responsibilities that scientists and researchers have to society, particularly when the results of the research they conduct directly impact human health, public policy, specific segments of a population, or the environment. These externally-focused responsibilities are often referred to collectively as the social responsibility of scientists.

14.1 Ethical Issues in Psychological Research

Research involving human subjects must follow certain ethical standards to make sure the subjects are not harmed. Such harm can be quite severe in medical research unless certain precautions are taken. For example, in 1932 the U.S. Public Health Service began studying several hundred poor, illiterate African American men in Tuskegee, Alabama. The men had syphilis, for which no cure then existed, and were studied to determine its effects. After scientists found a decade later that penicillin could cure this disease, the government scientists decided not to give penicillin to the Tuskegee men because doing so would end their research. As a result, several of the men died from their disease, and some of their wives and children came down with it. The study did not end until the early 1970s, when the press finally disclosed the experiment. Several observers likened it to experiments conducted by Nazi scientists. If the subjects had been white and middle class, they said, the government would have ended the study once it learned that penicillin could cure syphilis (Jones, 1Fortunately, sociological research does not have this potential for causing death or serious illness, but it still can cause other kinds of harm and thus must follow ethical standards. The federal government has an extensive set of standards for research on human subjects, and the major sociology professional society, the American Sociological Association, has a code of ethics for sociological research.

One of the most important ethical guidelines in sociological and other human-subject research concerns privacy and confidentiality. When they do research, sociologists should protect the privacy and confidentiality of their subjects. When a survey is used, the data must be coded (prepared for computer analysis) anonymously, and in no way should it be possible for any answers to be connected with the respondent who gave them. In field research, anonymity must also be maintained, and aliases (fake names) should normally be used when the researcher reports what she or he has been observing.

Some sociologists consider the privacy and confidentiality of subjects so important that they have risked imprisonment when they have refused to violate confidentiality. In one example, a graduate student named Mario Brajuha had been doing participant observation as a restaurant waiter on Long Island, New York, when the restaurant burned down. When the police suspected arson, they asked Brajuha to turn over his field notes. When Brajuha refused, he was threatened with imprisonment. Meanwhile, two suspects in the case also demanded his field notes for their legal defense, but again Brajuha refused. The controversy ended 2 years later when the suspects died and the prosecutor's office abandoned its effort to obtain the notes (Brajuha& Hallowell, 1986).

In another case, a graduate student named Rik Scarce refused to turn over his field notes on radical environmentalists after one of the groups he was studying vandalized a university laboratory. Scarce was jailed for contempt of court when he refused to tell a grand jury what he had learned about the group and spent several months behind bars (Monaghan, 1993).

A third example aroused much discussion among sociologists when it came to light. Laud Humphreys studied male homosexual sex that took place in public bathrooms. He did so by acting as the lookout in several encounters where two men had sex; the men did not know Humphreys was a researcher. He also wrote down their license plates and obtained their addresses and a year later disguised himself and interviewed the men at their homes. Many sociologists and other observers later criticized Humphreys for acting so secretly and for violating his subjects' privacy. Humphreys responded that he protected the men's names and that their behavior was not private, as it was conducted in a public setting (Humphreys, 1975).981).

Another ethical issue concerns consent. Before a researcher can begin obtaining data, the subjects of the research must normally sign an informed consent form. This form summarizes the aims of the study and the possible risks of being a subject. If researchers want to study minors (under age 18), they normally must obtain a signature from a parent or legal guardian. Informed consent is a requirement for most "real" research these days, but ethical issues arise over the meaning of "consent." For consent to have any real meaning, potential research subjects must have the right to refuse to take part in a research project without any penalties whatsoever. Otherwise, they may feel pressured to participate in the project without really wanting to do so. This result would violate what "consent" is supposed to mean in the research process. Sometimes subjects are promised a small reward (often between $5 and $20) for taking part in a research project, but they are still utterly free to refuse to do so, and this small inducement is not considered to be undue pressure to participate.

Informed consent becomes a particular problem when a researcher wants to include certain populations in a study. Perhaps the clearest example of such a problem is when a study involves

prisoners. When prisoners are asked to be interviewed or to fill out a questionnaire, they certainly can refuse to do so, but they may feel pressured to participate. They realize that if they do participate, they may be more likely to be seen as a "model" prisoner, which helps them win "good time" that reduces their sentence or helps them win a release decision from a parole board. Conversely, if they refuse to participate, they not only lose these advantages but also may be seen as a bit of a troublemaker and earn extra scrutiny from prison guards. Scholarly societies continue to debate the ethical issues involved in studies of prisoners and other vulnerable populations (e.g., offenders in juvenile institutions, patients in mental institutions), and there are no easy answers to the ethical questions arising in such studies.

As all these examples of ethical issues demonstrate, it is not always easy to decide whether a particular research project is ethically justifiable. Partly for this reason, colleges and universities have committees that review proposed human-subject research to ensure that federal guidelines are followed.

What ethical steps are required to respect intellectual property (IP) in research?

Ethical consideration of IP in research includes the following:

Appropriate referencing and acknowledging sources of IP inputs.

To the greatest extent possible, parties to the research should document consent regarding how IP may be used, how it will be safeguarded and who owns it. This applies in particular to IP as research objects including:

1. Proprietary knowledge, which is knowledge which has potential for commercial advantage.
2. Confidential knowledge, which is valuable or sensitive information which a reasonable person would regard as confidential.
3. Cultural knowledge, which is "insider" knowledge that is known only by people within a particular culture or by people who have learned about the culture through some kind of interaction with it.

Appropriate recognition of contributions to the research output such as publications, artefacts or commercially valuable items. Ownership rights to research outputs should be agreed before the research begins. It is recommended that a written agreement be developed, particularly in cases between students and their supervisor(s).

Research Ethics Guidelines

Research ethics provides guidelines for the responsible conduct of research. In addition, it educates and monitors scientists conducting research to ensure a high ethical standard. The following is a general summary of some ethical principles:

Honesty: Honestly report data, results, methods and procedures, and publication status. Do not fabricate, falsify, or misrepresent data.

Objectivity: - Strive to avoid bias in experimental design, data analysis, data interpretation, peer review, personnel decisions, grant writing, expert testimony, and other aspects of research.

Integrity: Keep your promises and agreements; act with sincerity; strive for consistency of thought and action.

Carefulness: Avoid careless errors and negligence; carefully and critically examine your own work and the work of your peers. Keep good records of research activities.

Openness: Share data, results, ideas, tools, resources. Be open to criticism and new ideas.

Respect for Intellectual Property: Honor patents, copyrights, and other forms of intellectual property. Do not use unpublished data, methods, or results without permission. Give credit where credit is due. Never plagiarize.

Confidentiality: Protect confidential communications, such as papers or grants submitted for publication, personnel records, trade or military secrets, and patient records.

Responsible Publication:

Publish in order to advance research and scholarship, not to advance just your own career. Avoid wasteful and duplicative publication.

14.2 Plagiarism

Plagiarism is presenting someone else's work or ideas as your own, with or without their consent, by incorporating it into your work without full acknowledgement. All published and unpublished material, whether in manuscript, printed or electronic form, is covered under this definition. Plagiarism may be intentional or reckless, or unintentional. Under the regulations for examinations, intentional or reckless plagiarism is a disciplinary offence.

Some examples of plagiarism:

- a sequence of words incorporated without quotation marks
- an unacknowledged passage paraphrased from another's work
- the use of ideas, sound recordings, computer data or images created by others as though it were one's own"

How Can You Avoid Plagiarism in a Research Paper?

1. Paraphrase your content

Do not copy–paste the text verbatim from the reference paper. Instead, restate the idea in your own words.

Understand the idea(s) of the reference source well in order to paraphrase correctly.

2. Use Quotations

Use quotes to indicate that the text has been taken from another paper. The quotes should be exactly the way they appear in the paper you take them from.

3. Cite your Sources – Identify what does and does not need to be cited

The best way to avoid the misconduct of plagiarism is by self-checking your documents using plagiarism checker tools.

Any words or ideas that are not your own but taken from another paper need to be cited.

Cite Your Own Material—If you are using content from your previous paper, you must cite yourself. Using material, you have published before without citation is called self-plagiarism.

The scientific evidence you gathered after performing your tests should not be cited.

Facts or common knowledge need not be cited. If unsure, include a reference.

Turnitin Software

Turnitin is an originality checking and plagiarism prevention service that checks your writing for citation mistakes or inappropriate copying. When you submit your paper, Turnitin compares it to text in its massive database of student work, websites, books, articles, etc.

5 ways How to Reduce Similarity on Turnitin

Cite your sources to avoid plagiarism. ...

Use Quotation marks to reduce similarity. ...

Avoid too many quotes. ...

Paraphrase thoroughly to remove plagiarism. ...

Avoid copying word-to-word.

iThenticate Software

iThenticate is a plagiarism prevention tool that compares documents (including journal article manuscripts, proposals, research reports, thesis, and dissertations, etc.) against millions of published works available through the Internet and subscription databases.

14.3 Arrangement of References

Definition

The Reference list provides information for readers who may want to access the sources you cite in your paper. The Reference page is located at the end of your paper. Start a new page and title your list Reference. Then list in alphabetical order all the sources that you have cited in the paper. Unless your instructor asks for them, sources not actually cited in the paper should not be given in this list, even if you have read them.

Reference List Guidelines

- Centre "References" in the middle of the page.
- Do not bold, underline, or capitalize.
- Running header for professional papers.
- Continue the page numbering.
- Arranging the Order of References
- To put it simply, arranging your APA reference list is very straightforward. Simply alphabetize the entries letter by letter. More specifically, reference list entries are arranged using the author's last name first, then their first name initials.
- Often, you will find the names of the same researchers and writers, as they specialize in specific fields. For example, Paul Jaeger is a well-known expert in the field of library information and has several articles published by himself and with other experts. In this case, you alphabetize by the order of the author's name as listed in the publication.

APA Abbreviations

APA style has acceptable abbreviations for editions, volumes, and so forth. Use these abbreviations in your reference entries:

Source: Publication Manual of the American Psychological Association, Sixth Edition.

- ed. edition
- Rev. ed. Revised edition
- 2nd ed. second edition
- Ed. (Eds.) Editor (Editors)
- Trans. Translator(s)
- n.d. no date
- Vol. Volume (ex: Vol. 8)
- Vols. Volumes (ex: Vols. 3-8)
- No. Number

- Pt. Part
- Tech. Rep. Technical Report
- Suppl. Supplement

Steps to Referencing

- Record- At the time of reading a document, record all of the information (descriptive elements) necessary to create a citation. The data you record should include the page numbers for direct quotations and for journal articles or book chapters.

The descriptive elements for a variety of document types are listed below. These lists will help you to keep the information necessary to create your references. Be careful with photocopied articles from journals or chapters from books. You must keep a record of the journal where the article was published or the book where you found the chapter.

- Author's surname and initials or given name
- Title of publication
- Title of series, if applicable
- Volume number or number of volumes, if applicable
- Edition, if not the first
- Editor, reviser, compiler or translator, if other than the author
- Publisher
- Year of publication
- Page number(s), if applicable
- Parts of books (chapters, sections, conference papers, etc.)
- In addition to the details for the Whole Book (see above) record the following information specific to the part:
- Author's surname and initials or given name (of the part)
- Title of the part
- Inclusive page numbers of the part

Steps to Referencing (Journal Articles)

- Author's surname and initials or given name
- Title of the article
- Title of the journal
- Volume and issue number
- Year of publication
- Inclusive page number

Steps to Referencing (Electronic Documents)

- Author's surname and initials or given name if present
- Title of the document
- Title of the webpage
- URL
- Page or section numbers if given
- Format

- Year of publication or latest update date
- DOI
- Internet address

Steps to Referencing

- Please note: Not all electronic documents have an obvious author or title, so you will sometimes need to use your own judgment to determine these details. Be aware that pagination may not be present or appropriate for many electronic publications.
- Organize- File or store this information, and the source documents if you have them, in a manner and format that can be easily accessed at a later date. You may wish to write all the details on the print copy of an article you are using; or you may wish to keep a system of filing cards for each reference item you use.
- Alternatively, you may decide to maintain a master reference list on your computer, which you add details to as required. There are a number of software packages now available. One example is EndNote, which you can use to manage your references. These programs can be used to produce reference or works cited lists in a specified style.
- Cite- Construct your citations within the text of your essay, using the appropriate guidelines for the style of citation you are using.
- List-Create either a reference or works cited list at the end of your essay or thesis. Titles of books and journal titles should be italicized. The use of capitals and punctuation should be consistent and will vary according to the citation style being used.
- The usual arrangement for a reference list in APA style is a single sequence in alphabetical order by author, with the author's surname preceding the initials. Where an item has no author, it is usual to list it alphabetically by title in the reference list in sequence by the first significant word of the title. Email address

Conclusion

When you are writing a piece of work and use someone else's words or ideas, you must reference them.

This means that you need to include detailed information on all sources consulted, both within your text (in-text citations) and at the end of your work (reference list or bibliography).

14.4 Bibliography

Definition

A bibliography is a list of words (such as books and articles) written on a particular subject or by a particular author.

A bibliography may appear at the end of a book, report, online presentation, or research paper. Students are taught that a bibliography, along with correctly formatted in-text citations, is crucial to properly citing one's research and to avoiding accusations of plagiarism. In formal research, all sources used, whether quoted directly or synopsized, should be included in the bibliography.

Annotated Bibliography

An annotated bibliography includes a brief descriptive and evaluative paragraph (the annotation) for each item in the list. These annotations often give more context about why a certain source may be useful or related to the topic at hand.

Types of Bibliography

Bibliography has been used in three popular styles

1. APA Reference Style
2. Chicago Bibliographic Style
3. Modern Language Association

14.5 APA Reference Style

Student researching for citations and bibliography. The most popular reference list is found in the American Psychological Association writing style. Originating in 1929, in the Psychological Bulletin, the APA style is designed for psychology, education, social science and technical research.

This style breaks down formatting citations for journals, books, manuals and other technical sources. That's not to say, though, that there isn't formatting for sources like blogs and photographs; APA just makes citing statistics, research findings and technical reports easier. It isn't just the citation either. The tone and word usage are also regulated by APA style. For example, APA style writing should use non-biased writing and an active voice.

When creating a reference list in APA, the author and date are the first things that you will see. This is because the in-text citations follow the author-date format. Formatting sources for citation pages will follow a unique format whether you are listing a journal, book, web page or blog.

Book:

Calfee, R. C. (1991). APA guide. Washington, DC: American Psychological Association.

Journal article:

Jourls, H. F. (1983). Fundamentals of medicine. Journal of Medicine, 46, 837-845.

Magazine article:

Henry, W. (2001, April 19). Making the grade. Time, 135, 28-31.

Chicago Bibliography Styles

Now, it's time to look at the great bibliography. Chicago Manual of Style (CMOS) is by far one of the most common bibliographies around. Chicago also comes in a student-friendly version called Turabian. With 17 editions, Chicago style has been in print since 1906. While Chicago will use a reference list for the citation page, you can also create a bibliography if you use notes for the in-text citations. Notes can be in the form of endnotes or footnotes.

Bibliographical Sourcing

Chicago bibliographies are a good general style. It also works for different fields like history, anthropology, theology and philosophy. Chicago is good for web sources, along with audio-visual sources, lectures and even recordings. Examples of formatting for a Chicago bibliography include:

Example – Web page:

 Heck, Jim. "About the Philosophical Gourmet Report." Last modified July 8, 2011.

 http://rgheck.frege.org/philosophy/aboutpgr.php.

Example – Facebook:

 Chicago Manual of Style. "Is the world ready?" Facebook, April 19, 2017.

 https://www.facebook.com/ChicagoManual/posts/10152906193679151.

Example – Audio-visual:

Beyoncé. "Sorry." Directed by Kahlil Joseph and Beyoncé Knowles. June 22, 2016. Music video, 4:25. https://youtu.be/QxsmWxxouIM.

MLA (Modern Language Association) STYLE

MLA Works Cited

A works cited is the citation page of the popular style by the Modern Language Association. The MLA style sheet was first published in 1951. It was taken out of print in 2016 but is still a popular writing style. Designed for literature, arts and philosophical writing, MLA breaks down how to format non-print materials like web pages, personal interviews, advertisements and other communications sources.

Perfect Citations

Since MLA helps format sources that might not have a publication date, like web pages, using an author-page format makes it easy for people to find the information. Formatting citations for an MLA works cited looks like:

Example – Web page:

Lindsey, Suzie. "How to Make Vegetarian Chili." eHow,

www.ehow.com/how_10727_make-vegetarian-chili.html. Accessed 25 Nov 2018.

Example – Image:

Klee, Paul. Twittering Machine. 1922. Museum of Modern Art, New York. The Artchive, www.artchive.com/artchive/K/klee/twittering_machine.jpg.html. Accessed 9 January 2019.

Example – Email:

Collens, Suzie. "Re: Literature." Received by Jennifer Betts, 15 Nov. 2018.

Properties of Bibliography

- Make research more efficient.
- Separate reliable, peer-reviewed sources from the unreliable or out-of-date.
- Establish classic, foundational works in a field.
- Provide a guide for independent study.
- Structure a class syllabus.
- Create a course reading and supplemental reading list.
- Assist with student advisory.
- Help with collection development
- Support research advisory
- Stimulate ideas for events and displays

A bibliography is a list of cited works--journal articles, films, books--on a particular topic. Bibliographies are also referred to as 'References', 'Works Cited' or 'Works Consulted'.

Summary

Keywords

Target Audience, Abstract, footnotes, headnotes, endnotes, Bibliography, Linkage, Master Linkage Map.

SelfAssessment

1. There are five types of Research report.

A. True

B. False

2. Footnotes are of three types.

A. True

B. False

3. Headnotes are used as introduction of legal documents.

A. True

B. False

4. Endnotes are placed on every page.

A. True

B. False

5. There are three popular styles of Bibliography.

A. True

B. False

6. What is the full form of MLM?

a. Material Loading Matrices

b. Master Linkage Map

c. Marital Law Monitor

d. None of them

7. What is the full form of PPID?

a. People's Protocol in Disaster

b. People's Protection in Disaster

c. Project Person Identifier

d. None of them

8. Full form of APA is --------

a. Automatic Punctuation Assimilation

b. American Psychological Association

c. Amendments of Proper Abbreviations

d. None of them

9. n.d. stands for---------

a. no detail

b. no document

c. no date

d. none of them

10. There are -------- steps of referencing.
a. 2
b. 3
c. 4
d. 5

11. What does it mean by writing ibid?
a. In the wrong place
b. In the right place
c. In the same place
d. None of them

12. Footnotes are ------- included when printing specific pages.
a. Automatically
b. Partially
c. Inversely
d. None of them

13. Footnotes are of ------- types.
a. 1
b. 2
c. 3
d. 4

14. Research Report is written in a ---------- language.
a. Formal
b. Informal
c. Non-verbal
d. None of them

15. --------- Research Report is related to Industry-based research.
a. Qualitative
b. Technical
c. Quantitative
d. None of them

Answers for Self Assessment

1A, 2B, 3A, 4B, 5A, 6B, 7C, 8B, 9C, 10C, 11C, 12A, 13B, 14A, 15B.

Review Questions

1. Briefly discuss different types of Research Report.
2. Elucidate different reference guidelines.
3. What are the different steps of referencing?
4. Write the importance of footnotes.
5. Write different reference styles in Bibliography.
6. What are the characteristics of a Research report?

7. What are the advantages and disadvantages of Footnotes?
8. What are the properties of Bibliography?
9. What do you mean by Probabilistic Linkage?
10. How can anyone access Linkages?

Further Readings

-  The Practice of Psychological Research by Earl, R. Babbie-13th ed. Wadsworth Publishing Co.inc.2011
-  Methods of Psychological Research by Paul, K. Hatt& William, J. Goode. Surjeet Publication. 2018.

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