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Research Methods II



Scientific Method and Psychology



Science?

Science is a general systematic and objective empirical approach to understand the world around.



Key Features of Science:

- 1. systematic empiricism**
- 2. empirical questions.**
- 3. public knowledge.**

Scientific Method and Psychology

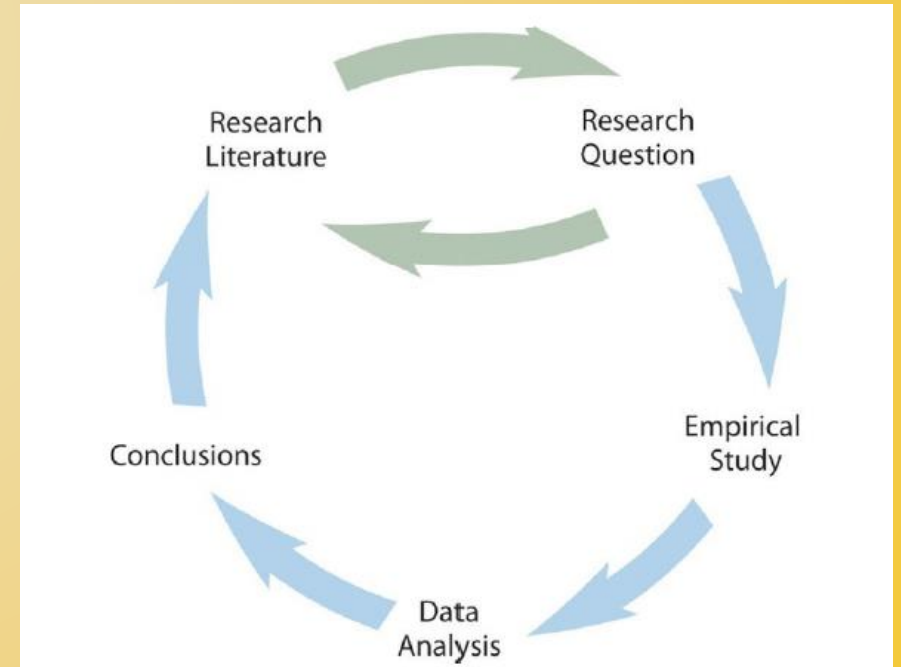
► Is Psychology science?

Yes, it is science because it try to understand human behaviour through systematic and objective approach based on empirical evidence.

► Scientific Approach in Psychology

Research in psychology can be described by a simple cyclical model.

A research question based on the research literature leads to an empirical study, the results of which are published and become part of the research literature.





Scientific Method and Psychology



Research ?

Research is the use of scientist method to solve problems.



Psychological Research

Psychological Research is the use of scientist method to solve Psychological problems.

Examples of Psychological Problem

How personality impact human learning?





Scientific Method and Psychology



➤ Research Questions?

1. Research Problem are expressed as Research questions.
2. Research Questions are expressed in terms of variables and relationships between variables.

➤ A good Research Question Should be

1. Interesting
2. Empirical
3. Feasible

Reviewing Literature

➤ What is literature Review?

It means find, read, and summarize the existing research relevant to research question.

➤ Why we should do it?

1. It helps to develop and formulate interesting research question.
2. It avoid us to replicate already answered research questions.
3. It help us to evaluate the significance our own research problem.
4. It guide us to the way to conduct own study.

Reviewing Literature

➤ What is Research literature?

The **research literature** in any field is all the published research in that field.

➤ The **research literature might include:**

1. Professional Journals.
2. Scholarly Books
3. Unpublished Research Thesis (PhD, Masters and Graduate level.

Reviewing Literature

➤ **Where we can find Literature?** at is Research literature?

1. Search Engines Google
2. Data bases ERIC, PsycINFO and Other Databases, ProQuest, SCOPUS, WEB OF SCIENCE JSTOR,
3. University Libraries
4. Directory of Open access Journals



Research Ethics (History, Importance and Types)

➤ Research Ethics?

These are practices that assure protection and safety of human and non-human participants/subject in research and lead to unbiased and complete reporting of the research process and research results to the public and experts.



Research Ethics (History, Importance and Types)

➡ History of Research Ethics Codes

1. **Nuremberg Code**—a set of 10 principles written in 1947
2. **Declaration of Helsinki** is a similar ethics code that was created by the World Medical Council in 1964.
3. **Belmont Report 1978.**
4. Federal Policy for the Protection of Human Subjects

Research Ethics (History, Importance and Types)

➤ Importance

1. The researcher's **sponsor** is **not mislead**.
2. Private and public **money** is more **easily obtained** if ethical procedures are guaranteed.
3. Researchers' **reputation** will be **enhanced**.



Research Ethics (History, Importance and Types)

- **APA Ethics Code**
- 8.01 Institutional Approval
- 8.02 Informed Consent to Research
- 8.03 Informed Consent for Recording Voices and Images in Research
- 8.04 Client/Patient, Student, and Subordinate Research Participants
- 8.05 Dispensing With Informed Consent for Research
- 8.06 Offering Inducements for Research Participation



Research Ethics (History, Importance and Types)

➤ **APA Ethics Code**

- 8.07 Deception in Research
- 8.08 Debriefing
- 8.09 Humane Care and Use of Animals in Research
- 8.10 Reporting Research Results
- 8.11 Plagiarism
- 8.12 Publication Credit
- 8.13 Duplicate Publication of Data
- 8.14 Sharing Research Data for Verification
- 8.15 Reviewers

Measurements in Psychology

➤ Measurement

It is the process of assigning such scores to individuals that represent their certain characteristic.

Psychometrics?

Psychological measurement is often referred to as **psychometrics**.

Psychological Construct

Psychological variables which cannot be observed or measured directly are called Psychological constructs. Example: Fear, Anxiety, Intelligence, Personality.

Measurements in Psychology

➤ How to Define a Construct:

1. The conceptual definition
2. Operational Definition

➤ Levels of Measurement

1. Nominal
2. Ordinal
3. Interval
4. Ratio

Measurements in Psychology

- Reliability and Validity of Measurement

- What is reliability

It is the degree to which a measure gives consistent measurements.

- Types reliability

1. Test-retest reliability
2. Equivalent Forms reliability
3. Split-half reliability
4. Cronbach alpha reliability
5. Interrater reliability

Measurements in Psychology

- Reliability and Validity of Measurement

- What is validity

It is the degree to which an instrument measures what it is supposed to measure.

- Types of Validity

1. Face validity
2. Content validity
3. Criterion validity
4. Discriminant validity

Conducting Experiments in Psychology

► What Is an Experiment?

An experiment is a type of study designed specifically to answer the question of whether there is a causal relationship between two variables.

Do changes in an independent variable *cause* changes in a dependent variable?

► Experiments have two fundamental features.

1. First: The researchers manipulate, or systematically vary, the level of the independent variable. The different levels of the independent variable are called conditions. The conditions are supposed to cause a change in dependent variable
2. Second: the researcher controls, or minimizes the variability in, variables other than the independent and dependent variable. These other variables are called extraneous variables.

Conducting Experiments in Psychology

➤ Internal and External Validity in Experiments

➤ Different Experimental Designs

➤ Steps to conduct Experiments in Psychology

1. Ask a question or find a research problem to solve
2. Determine what you will test to answer this question
3. Review current knowledge on the subject
4. Design an experiment
5. Perform your experiment
6. Analyze results using statistical methods
7. Draw your conclusion and share the results with the scientific community

Source:

<https://www.verywellmind.com/how-to-conduct-a-psychology-experiment-2795792>

Non-Experimental Research in Psychology

► What is non-experimental Research

It is the research that lacks the manipulation of an independent variable, random assignment of participants to conditions or orders of conditions, or both.

► The conditions to opt non-experimental Research in Psychology

1. The research deals with a single variable
2. The research deals with a non-causal statistical relationship between variables
3. Although, research is about a causal relationship, however, independent variable cannot be manipulated.
4. The research question is of exploratory nature.

Non-Experimental Research in Psychology

➤ Types of Non-experimental Research

1. **Correlational Research:** Correlational research involves measuring two variables and assessing the relationship between them, with no manipulation of an independent variable
2. **Qualitative Research:** It generally involves asking broader research questions, collecting more detailed data (e.g., interviews), and using non-statistical analyses.
3. **Cross-sectional Research:** it involves collection of same data from two or more pre-existing groups of people for comparison at the same period of time.
4. **Longitudinal Research:** it involves collection of same data from same groups of people for comparison at the different period of time.

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Key Issues in Survey Research

- What is survey research?
- Survey research is a quantitative approach that features the use of self-report measures on carefully selected samples.
- 1. **Cross-sectional Survey:** it involves collection of same data from two or more pre-existing groups of people for comparison at the same period of time.
- 2. **Longitudinal Survey:** it involves collection of same data from same groups of people for comparison at the different period of time.

Key Issues in Survey Research

John M. Kennedy and Brian Vargus (2001)

<https://journals.sagepub.com/doi/pdf/10.1177/0899764001303006>

highlighted following issues of Survey Research:

1. Sampling Issues
2. Survey Questions and Questionnaires issues
3. Costs
4. Non-Response Problems
5. Implications for Philanthropic Studies

Read the detail at:

<https://journals.sagepub.com/doi/pdf/10.1177/0899764001303006>

Sampling Issues in Psychological Research

➤ Population

A group of individual having one or more characteristics interesting to the research is called population.

➤ Sample

A small proportion of the population selected for data collection in research.

Types of Sampling

1. Probability
2. Non-Probability

➤ A Guide for Sapling Design

- 1- *Define the population you want to study.*
- 2 *Define your sample frame and determine sources of non-coverage.*
- 3 *Consider sources of response bias.*

Sampling Issues in Psychological Research

➤ A Guide for Sampling Design (Continue)

4 Decide on how you are going to measure responses

5 Decide on whether to measure your focal question of interest as a categorical, count, or continuous variable.

6 Decide on how wide a margin of error you are willing to accept.

7 Estimate your expected response rate.

8 Calculate how many people you need to sample.

➤ **If sample is not representative and is small then the problems are**

1. We can not run certain statistics analysis on small samples such as Structure Equation modelling etc.
2. We cannot generalise our research results.
3. We can infer wrong conclusions
4. We can waste time of ourselves and research participants.

Systematic Reviews and Psychology

- What is systematic Review?
- A Systematic review bring together the research already done about any issue
- **Systematic reviews** are a type of literature review that uses systematic methods to collect secondary data, critically appraise research studies, and synthesize findings qualitatively or quantitatively.
- **Approaches to systematic reviews and synthesis**
- **Aggregative approaches to synthesis:** Aggregation is commonly used to test hypotheses through collecting empirical data. Primary research testing, for example, the hypothesis that a certain action has a particular effect, may use experimentally controlled evaluations. A review asking the same research question would be likely to include such experimental studies and to use a review method reflecting the same research approach (an *a priori* approach that aggregates data).

Systematic Reviews and Psychology

- **Configuring approaches to synthesis:** Configuring is commonly used to organize ideas, concepts and theories. Primary research asking how to conceptualize the processes occurring in some phenomena may, for example, use small scale qualitative methods such as ethnography. A review asking the same research question would be likely to include such ethnographic or similar small scale qualitative studies and to use a review method reflecting the same research approach (an iterative approach that configures conceptual data).
- Steps in a systematic Review
- <https://www.annualreviews.org/doi/full/10.1146/annurev-psych-010418-102803>

Thematic Analysis

- Thematic Analysis
- Thematic analysis has been defined broadly as “a way of seeing” and “making sense out of seemingly unrelated material” (Boyatzis, 1998, p. 4).
- Braun and Clarke (2006) identify it as a method for identifying and analyzing patterns of meaning in a dataset (i.e., texts)
- ***The typical process of thematic analysis***
- Clarke and Braun (2014; see also Braun & Clarke, 2006, and Braun, Clarke, & Rance, 2015, pp. 188–189) present a recursive six-phase process for thematic analysis:
 - 1 Familiarise yourself with data: Transcribe data and identify important potential.

Thematic Analysis

Thematic Analysis

- 2 Make list of codes from text to answer the research question(s); Applying coding and collate codes across segments of the dataset
- 3 Searching for themes from the coded and collated data to identify bigger picture.
- 4 Applying the potential themes to see their success in convincing story to answer the research question. This may be carried out by refining combining and discarding themes.
- 5 Define and name themes and identify their position in data.
- 6 Produce report; link all related themes and data segments to communicate their success in answering research questions to experts.
- For further Reading:
- <https://thepsychologist.bps.org.uk/volume-26/edition-2/methods-teaching-thematic-analysis>
- <https://www.psych.auckland.ac.nz/en/about/thematic-analysis.html>

Content Analysis

Content Analysis

- According to Stemler, Steve (2001) it is a systematic, replicable technique for compressing many words of text into fewer content categories based on explicit rules of coding.
- Types of Content Analysis by **Hsieh and Shannon**, (2015)
 1. **Conventional (formative analysis)**
 2. **Directed analysis**
 3. **Summative analysis**
- **For detailed reading Please visit:**
<https://psychologyrocksblog.wordpress.com/content-analysis-as-a-research-method/>
- https://www.simplypsychology.org/Content_analysis_overview.pdf

Content Analysis

Steps of Content Analysis

- **The ten steps of content analysis**

- Please read the step of content analysis at link below:

https://www.le.ac.uk/oerresources/lill/fdmvco/module9/page_74.htm

APA Style

- APA style is a set of guidelines for writing in psychology. It is the genre of writing that psychologists use to communicate about their research with other researchers and practitioners.
- Please consult the following sources:

https://owl.purdue.edu/owl/research_and_citation/apa_style/apa_formatting_and_style_guide/general_format.html

<https://library.hud.ac.uk/pages/apareferencing/>

<http://kildekompasset.no/references/apa-6th.aspx>

Research Report

- An APA-style empirical research report consists of following Sections
- abstract
- The introduction
- literature review
- The method section
- The results section
- The discussion
- Conclusion
- References
- Appendices

Research Report

- Please visit following sites to see sample research report:
- <https://opentextbc.ca/researchmethods/chapter/writing-a-research-report-in-american-psychological-association-apa-style/>
- <http://www.thewritesource.com/apa/apa.pdf>
- https://owl.purdue.edu/owl/research_and_citation/apa_style/apa_formatting_and_style_guide/apa_sample_paper.html