

Research Methods in Psychology

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Research Methods in Ψ

- Focus on the types of studies and experimental methods that are used to address the questions of Psychologists.



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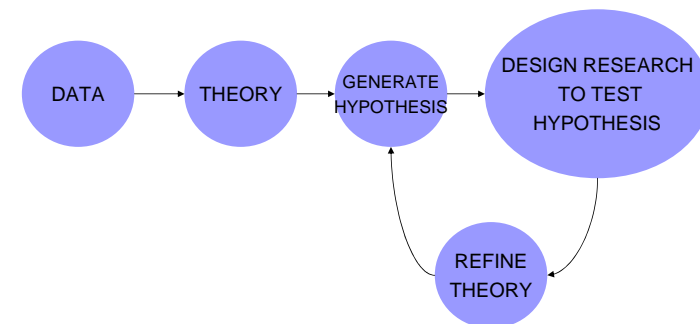
Key Questions for Ψ

- What are the different methods use in Ψ ?
- How much control can researchers actually exert over situations when conducting studies in Ψ ?
- What terminology must I learn to be able to understand Ψ research?
- What challenges do Ψ researchers face, and what would it be like to conduct this research?
- When I read studies in Ψ , what do I need to know to evaluate them intelligently?



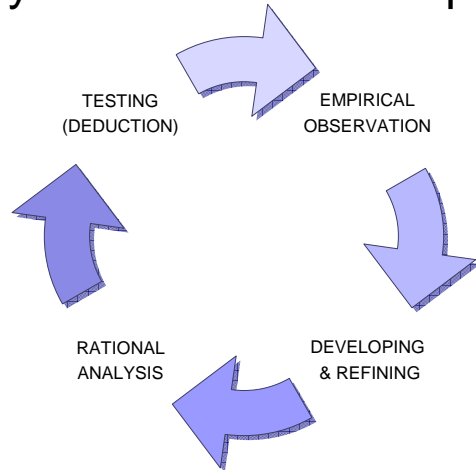
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The Research Process



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The Cycle of Scientific Enquiry



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Important Issues in Research

- Operational definitions
- Measurement issues (qualitative v. quantitative)
- Access
- \$\$\$\$\$\$\$\$
- Demand characteristics
- Placebo effect
- Experimenter bias
- Sampling Bias
- Ethics

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Sample Study

- Design a research to study to investigate of the efficacy of a exposure to music on the outcome of intelligence.
 - Consider:
 - Who/how would you recruit?
 - How would you assess?
 - Over what period?
 - What ethical issues might you address?

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Fundamentals of design



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Basic Vs. Applied Research

- **Applied research**
 - **Designed to solve real-world problems**
 - **Smoke cessation**
- **Basic research**
 - **Designed to learn about fundamental psychological processes**
 - **Memory**

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Scientific Inference

Hypothesis Testing

- If we only have a sample from two populations, then any difference might be just due to random variations in our samples.
- Hypothesis testing allows us to guess whether there is a real effect, or whether it is probably just random variations. It does not allow us to prove effects are real, only to make a rational decision as to whether we are going to take them as real.
- **Hypothesis** - Formal statements or predictions, usually derived from evidence from earlier research or theory.

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Hypothesis Testing: The basic procedures

- A model of the world is created in which there are **no** effects (e.g. a change in one variable is not associated with a change in another for variable) - the **Null Hypothesis**.
- **Examples:**
 - The difference between the means of groups A & B is zero.
- The results of the research are compared with this model. If, given the model, the results are unlikely, then the model (**null hypothesis**) is rejected, and the effects are accepted as real. This decision is based on probabilities.

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Hypothesis Testing: The basic procedures

- All that hypothesis testing does is working out his probability – “*how likely is it that this difference is just due to random variation?*”
- If we find that one sample has a mean of 12 and the other has a mean of 16, then the difference is 4, and we can look on the sampling distribution to see how likely this looks if the **null hypothesis** is true - that is, if the real difference is zero, how likely is it that these two samples will differ by 4 points?

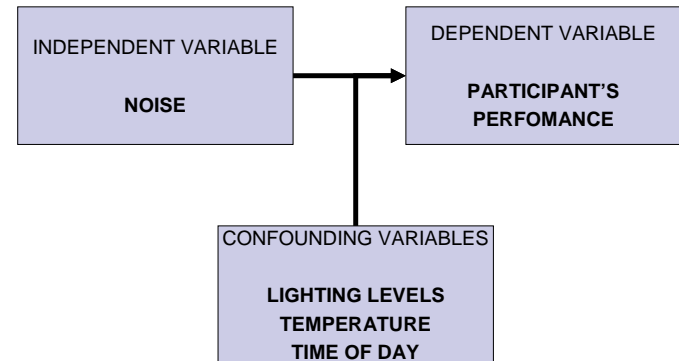
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Variables

- **Independent Variable (IV)** – The variable the researcher manipulates, uses to group people, or uses to predict dependent variable.
- **Dependent Variable (DV)** - The outcome, the result you are trying to predict.

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Variables



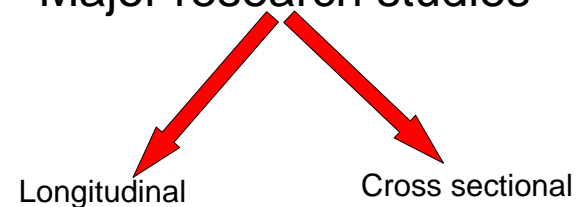
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One and Two-tailed tests

- **1-Tailed Tests** – The results are interesting only if they turn out in a particular direction.
- **2-Tailed Tests** – The results would be interesting only if they turn out in a particular direction.
- You must choose one or two-tailed tests before you do your research. If you are in doubt, use a two-tailed tests.
- **Howell (1992)** - Never use one-tailed tests, because you would still be interested if you found the opposite results to those you expected.

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Major research studies



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Cross-sectional Studies

- A study in which separate groups of subjects at different stages are compared.
 - E.g. a study comparing onset of depression in childhood against adulthood.
- **Pit-falls:** Since performance is being tested in two separate groups, it is hard to determine the cause of any difference in performance that might be found. There may be hidden differences between the two groups, aside from their age, that are the real cause of the behavioural differences.



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Longitudinal Studies



- A study in which changes over time in the performance of a single group of subjects is studied.
 - E.g. a study comparing depression on the same group at different stages / ages.
 - **Advantages:** Controlling for some of the potentially confounding factors mentioned above for the simple reason that each individual can be directly compared with himself or herself at an earlier age.
 - **Disadvantages:** Cost, time, effort. Often very difficult, for practical reasons, to implement longitudinal studies: subjects may move to different geographical areas or decide that they are no longer interested in participating (attrition).
- In addition to the division between cross-sectional and longitudinal studies, two further divisions can be made...¹⁸

Experimental Studies

- A study in which one variable is **manipulated** (the independent variable, e.g. an environmental condition) and its effect on another variable (the dependent variable, e.g. effect on learning and recall) is observed.
- **Ethical dilemmas:** Not able to manipulate variables of Maternal Care vs. No Maternal Care.



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Observational Studies

- A study in which the variables of interest are observed, rather than manipulated.
- Harder to interpret than an experimental study because other, unmeasured factors, may be the cause of any observed relationship between the variables of interest.



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ETHICAL CONCERNS

What should Psychologists do to ensure that their research is ethical?



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ETHICAL CONCERNS

- Ethical issues become increasingly important in psychology. The key feature of ethical research with humans is voluntary informed consent, but other important features are the right to withdraw, debriefing and confidentiality.
- Special issues :
 - **Clinical Therapy** - It can be can be very difficult to know whether a specific form of treatment should be given to a particular individual.
 - **Animal Research** – Voluntary informed consent and the right to withdraw are not applicable. It is important that the likely benefits of any proposed animal research clearly outweighs the cost to the animal participants.

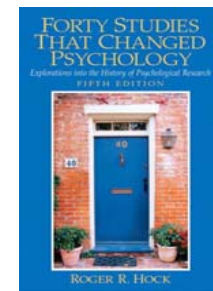
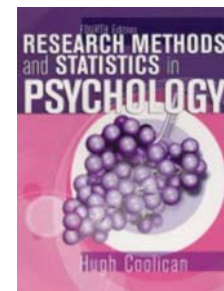
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ETHICAL CONCERNS

However, it can be hard in practice to predict ahead of time what the benefits and costs of a study are likely to be.

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References



- Coolican, H. (2004). Research Methods and Statistics in Psychology. Hodder Arnold.
- Hock, R.R. (2004) *Forty studies that changed psychology - explorations into the history of psychological research.* (5th Ed.) Prentice-Hall.

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Review Questions

- What should Psychologists do to ensure that their research is ethical?
- Using examples, discuss the ethical problems involved in conducting psychological research.
- To what extent can design flaws be eliminated in research?
- Why is it so problematic to carry out research on human participants?
- Are animals adequate substitutes for psychological research?
- How far is the experimental method an appropriate technique for studying human behaviour?

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Internet Links

- <http://gateway1.gmcc.ab.ca/~digdonn/psych104/think.htm#top> - Critical thinking page which analyses testable questions
- <http://www.execpc.com/~helberg/statistics.html> - Comprehensive page for statistics on the web; articles, resources and links.
- <http://www.psych.bangor.ac.uk/deptpsych/Ethics/HumanResearch.html> - Ethical conduct in research links page.

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