# Critical Principles of Experimental Research

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## Overview {-}

Are psychological researchers obligated to “tell the truth” to research participants as well as honestly and accurately share the meaning of their research findings with the world? What makes certain research practices “ethical” and others even “immoral, and who decides what is ethical? How do we know whether our testing methods are truly measuring and answering the questions that we are researching? Why is the statement “correlation is not causation” important? In this unit we will explore these critical issues and more.

We will discover the history of ethical practices in psychological research and the story of how it all came about and developed. We will explore what reliability and validity are and why they are so critical to psychological research in order to really contribute to any true knowledge and understanding of people and animals. We will determine what it takes to create a good research study and the pitfalls that researchers need to avoid. In short, we will learn what it takes to do good psychological research so that we can be more knowledgeable students, consumers, and practitioners of psychology.

### Topics {-}

This unit is divided into the following topics:

1. Ethics in Psychological Research
2. Basic Concepts and Methods in Experimental Design

### Learning Outcomes {-}

When you have completed this unit, you should be able to:

* Describe the history of the development of ethics in psychological research.
* Distinguish ethical practices in psychological research from unethical (“immoral”) practices.
* Define and explain the concept of informed consent, why it is important, and how it is obtained in most psychology experiments.
* Describe why debriefing is so critical to ethical research.
* Describe the purpose and function of Institutional Review Boards (IRBs) in ethical research
* List the main characteristics of a good hypothesis
* Define Reliability and Validity (including their various types) and explain how validity relates to reliability.
* Describe the main sources of bias in experiments and how to prevent it.
* Differentiate between Type I and Type II Errors.
* List various sampling methods.

### Activity Checklist {-}

Here is a checklist of learning activities that will help you deepen your understanding of the unit concepts. Activities are meant to be formative (unless otherwise specified), as in an ungraded opportunity for you to develop your thinking; however, many of these are designed to also help you with your summative assessments.

**Learning Activities**

**Activity 3.1: Read and Reflect**

* **Read Chapter 5 of the textbook and APA Code of Ethics**

**Activity 3.2: Case Study**

* **Learn about the ethical issues with the Stanford Prison Experiment**

**Activity 3.3: Read and Take Notes**

* **Read pages Chapter 6 of the textbook and take notes**

**Activity 3.4: Reliability and Validity**

* **Watch a video to learn more about reliability and validity**

**Assessment**

* Assignment 3: Ethical Case Studies
* Continue working on Assignment 1: Interview a Professional
* Continue working on Assignment 4: Start Part 2 and 3

### Resources {-}

Here are the resources you will need to complete this unit.

* Dunn, Dana S. (2013). The Practical Researcher: A Student Guide to Conducting Psychological Research. 3rd ed., John Wiley & Sons, Inc.
* Other resources will be provided online

## Ethics in Psychological Research

The practice of good and “moral” ethical practices is foundational and crucial in doing psychological research. It is important to strike a balance between caring for participants in research and the search for scientific truth. The protection, care, and respect for the welfare of human research participants and animal subjects should be of primary importance. The long history of the treatment of humans and animals in research has often been controversial but as the debates have continued, principles have developed to ensure the safety and minimize the suffering of human beings and animals involved in research. The Institutional Review Board's review, the informed consent of research participants prior to the research, as well as the debriefing participants after the conclusion of the research all serve to protect research participants.

### Learning Activities {-}

*Activities are meant to be formative (unless otherwise specified), as in an ungraded opportunity for you to develop your thinking; however, many of these are designed to also help you with your summative assessment so completing them is essential.*

### Activity: Read and Reflect {-}

Read Chapter 5 (pages 135-160) of our textbook.

Next read [Ethical principles of psychologists and code of conduct](http://www.apa.org/ethics/code/index.aspx) (American Psychological Association, 2017).

Pay particular attention to Section 8.

**Questions to consider:**

1. What stood out to you as the most important considerations in the protection of human participants and animal subjects in research?

2. Were there any points that surprised you in the Code of Ethics, including something that may have been left out?

### Activity: Case Study {-}

Watch the following videos describing the famous Zimbardo study that illustrates the worst in ethical research methods.

<https://youtu.be/d2TCfex1aFw>

[](https://youtu.be/d2TCfex1aFw)

<https://youtu.be/fS-YgKwAco8>

[](https://youtu.be/fS-YgKwAco8)

**Questions to consider:**

What specifically did Zimbardo do wrong in his famous experiment?

How did it violate the APA Code of Ethics?

## Basic Concepts and Methods in Experimental Design

In order for psychological research to be truly “scientific,” it must follow the Scientific Method. This entails considering the underlying, foundational principles of psychological research (reliability, validity, bias, etc.) and then following through with the appropriate methods to ensure that the results will truly provide answers to our research questions and that these answers can then be trusted to lead to conclusions that will build on the body of established research. Only in this way can Psychology be considered a science in the truest sense of the word.

Here are some of the important principles of research to keep in mind:

Reliability - the stability or consistency of a measure

Validity - considering whether an instrument is measuring what it is supposed to be measuring

Hypothesis - a statement of expectation of the results of the research

Null Hypothesis - a statement that counters the hypothesis, basically stating that it is not true.

Type 1 Error - when the researcher believes the hypothesis is true when it is not

Type 2 Error - when the researcher believes the hypothesis is not true when it is true

Bias - when the data is distorted because the researcher has incorporated their desired outcome into the methods. For example, bias can occur when participants modify their behavior based on their expectations of the research or based on the experimenter’s expectations.

These are brief explanations. The textbook will go into more detail and it is important that you understand these principles and how to use them when analyzing journal articles.

Learning Activities

### Activity: Read and Take Notes {-}

Read Chapter 6 (pages 164-209) of our textbook.

Take notes on the descriptions of the foundation principles of psychological research. How would you define them?

### Activity: Read and Take Notes {-}

For a more detailed understanding of the concepts of Reliability and Validity, watch the following video:

<https://youtu.be/KKCUoir5690>

[](https://youtu.be/KKCUoir5690)

## Unit Summary {-}

In this unit, you have had the opportunity to learn about the crucial importance of ethical practices in psychological research as well as the foundational principles and experimental methods for actually doing research. Your understanding of these concepts will greatly help you to be both a keen judge of past and current research as well as an ethical and skilled researcher yourself.

## Assessment {-}

After completing this unit, including the learning activities, you are asked to complete the following assessments. For more details and the submission boxes, please go to the Assessments tab.

### Assignment: Ethics Case Studies {-}

You will be given two cases to read and examine the ethics of each research study.

**Case Study 1** Instructions:

1. Read [Stuttering Research](https://far.twu.ca/arts/psyc322adc/u3/assessment/case1.pdf) and answer the following questions:
   * Which specific ethics were violated from the APA Code of Ethics, Section 8?
   * Is there are a way the research hypotheses could have been tested in an ethical way?
   * Feel free to express your reactions to the research.
2. Post your answers to the forum found in the "Assignments 1, 2, 3" tab.
3. Respond to two of your classmates' posts.

**Case Study 2** Instructions:

1. Read Research and Social Responsibility and answer the following questions in your own document:

* What are the factors that you think motivate some scientists to become advocates?
* How should Helen address this issue with her students?
* Is there an ethical difference between falsifying data to support a socially important conclusion and suppressing the publication of data that do not support the same conclusion?
* Is it ever acceptable to suppress the publication of scientifically valid data for social reasons?
* Should scientists ever engage in social activism using their data? Or does science require one to remain objective and engage all sides of a debated issue?

1. Submit your answers to the dropbox found in the "Assignments 1, 2, 3" tab under "Assessments". You do not need to respond to other students’ reflections.

**Grading Criteria**

Grading is based on your thoughtful reflections and ability to point out ethical errors in the case studies. Each case study is worth 5 points.

### Assignment: Your Research Project {-}

To stay on track with this assignment, begin the following tasks:

1. Find **five** research articles related to your topic or question.
2. Draft a hypothesis based on what type of study you imagine you would do for your topic.

### Assignment 1: Interview A Professional {-}

Do not forget to complete both parts of this assignment as it is due next week. Please take a look in the submission box for more details.

## Checking your Learning {-}

Before you move on to the next unit, you may want to check to make sure that you are able to:

* Describe the history of the development of ethics in psychological research.
* Distinguish ethical practices in psychological research from unethical (“immoral”) practices.
* Define and explain the concept of informed consent, why it is important, and how it is obtained in most psychology experiments.
* Describe why debriefing is so critical to ethical research.
* Describe the purpose and function of Institutional Review Boards (IRBs) in ethical research
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