

# Unit 0: Science Practices

Apply psychological perspectives, theories, concepts, and research findings.

Evaluate qualitative and quantitative research methods and study designs.

Evaluate representations of psychological concepts in quantitative and qualitative research, including tables, graphs, charts, figures, and diagrams.

Develop and justify psychological arguments using evidence.

<u>Topic</u>	<u>Learning Objective</u>	<u>Textbook Pages</u>
<b>Unit 0</b>	Identify psychology-related concepts in descriptions or representations of data.	
<b>0.1 Psychological Science and Research Design</b>	<p>Explain how cultural norms, expectations, and circumstances, as well as cognitive biases apply to behavior and mental processes.</p> <p>Evaluate the appropriate use of research design elements in experimental <b>AND</b> non-experimental methodology.</p> <p>Interpret quantitative or qualitative inferential data from a given table, graph, chart, figure, or diagram.</p>	<p><b>0-4 – 15</b></p> <p><b>0-18 – 19</b></p> <p><b>0-32 – 34</b></p>
<b>0.2 Non-Experimental Research</b>	<p>Determine the type of research design(s) used in a given study.</p> <p>Evaluate the appropriate use of research design elements in non-experimental methodologies.</p> <p>Interpret quantitative or qualitative inferential data from a given table, graph, chart, figure, or diagram.</p>	<p><b>0-16 – 18</b></p> <p><b>0-22 – 26</b></p>
<b>0.3 Experimental Research</b>	<p>Determine the type of research design(s) used in a given study.</p> <p>Evaluate the appropriate use of research design elements in experimental methodology.</p> <p>Interpret quantitative or qualitative inferential data from a given table, graph, chart, figure, or diagram.</p>	<b>0-27 – 29</b>
<b>0.4 Statistical Reasoning</b>	<p>Calculate and interpret measures of central tendency, variation, and percentile rank in a given data set.</p> <p>Interpret quantitative or qualitative inferential data from a given table, graph, chart, figure, or diagram.</p>	<b>0-40 – 46</b>
<b>0.5 Ethics in Research</b>	Evaluate whether a psychological research scenario followed appropriate ethical procedures.	<b>0-34 – 37</b>

# Psychological Science and Research Design

**Psychology:**

**Critical thinking:**

## Cognitive Biases

**Hindsight bias:**

**Overconfidence:**

**Confirmation bias:**

## Elements of Research Design

**Hypothesis:**

*What is falsifiability?*

**Operational definition:**

*Why is it important to operationalize within a study?*

## Outcomes

**Reliability:**

**Validity:**



Reliable, but not valid



Unreliable and hence not valid





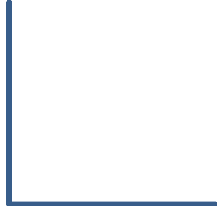
Reliable and valid

<b>Generalizability:</b>	
<b>Representation</b>	
Population	Sample
<b>Sampling:</b>	
<b>Sampling bias:</b>	
<b>Convenience sampling:</b>	
<b>Representative sample:</b>	
<b>Random sampling:</b>	
<i>Why is it crucial to have a representative sample?</i>	
<b>Measurement Instruments</b>	
<b>Qualitative research</b>	<b>Quantitative research</b>
Example(s)	Example(s)

Survey Method	
Survey	
How can surveys be used in other types of studies?	
Pros	Cons
<b>Self-report bias:</b>	
<b>Social desirability bias:</b>	
<b>Conclusions</b>	
<b>Peer review:</b>	
<b>Replication:</b>	
Why is replication important?	

# Non-Experimental Research

What benefit can non-experimental research have within psychological science?	
What limitation does all non-experimental research have?	
<b>Case Study</b>	
<b>Case study:</b>	
Pros	Cons
<b>Meta-Analysis</b>	
<b>Meta-analysis:</b>	
Pros	Cons
<b>Naturalistic Observation</b>	
<b>Naturalistic observation:</b>	
Pros	Cons
<b>Correlation</b>	
<b>Correlation:</b>	
Pros	Cons

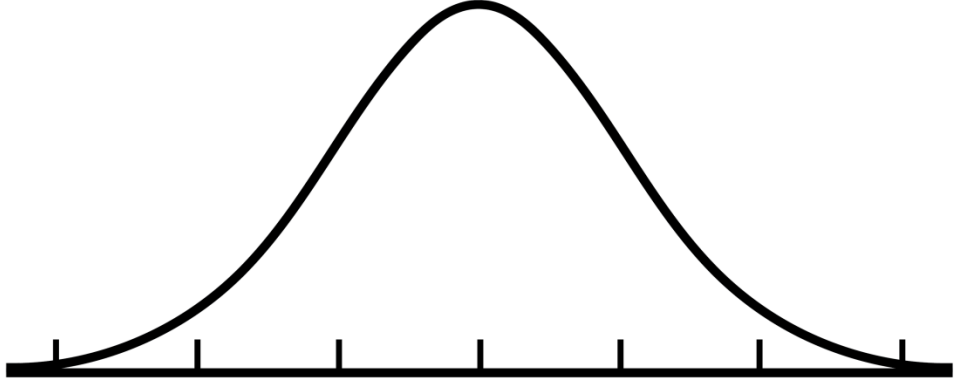
Positive Correlation	Negative Correlation	No Correlation
		
What is the name for these graphs that demonstrate correlation?		
<b>Correlational Coefficient</b>		
<b>Correlational coefficient:</b>		
<i>Simply stated, what does a correlational coefficient tell us?</i>	<i>What range does a correlational coefficient have?</i>	<i>What should you remember in reference to positive and negative?</i>
Which correlational coefficient has a stronger relationship within the given sets?		
-.70 or +.65	+.08 or +.33	
+.62 or -.89	-.54 or +.21	
<i>The first thing to look at to determine the value of a correlational coefficient &amp; why:</i>		
<i>The second thing to look at to determine the value of a correlational coefficient &amp; why:</i>		
<b>Considerations for Correlations</b>		
<b>Correlation <math>\neq</math> causation:</b>		
<b>Directionality problem:</b>		
<b>Third variable problem:</b>		
<b>Regression toward the mean:</b>		

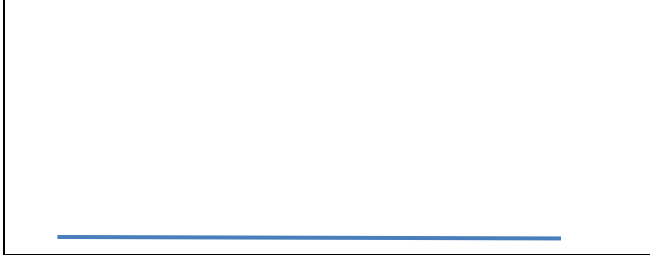
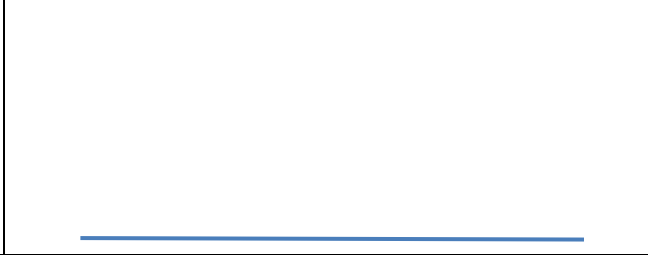
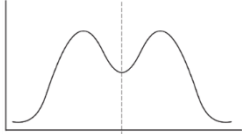
# Experimental Methodology

<b>Experiment:</b>	
<u>What sets the experimental method apart from the other types of research methods?</u>	
Elements of Experimentation	
<b>Control Group</b>	<b>Experimental Group</b>
<b>Independent Variable</b>	<b>Dependent Variable</b>
<b>Placebo:</b>	
<i>Why would an experiment need to use a placebo?</i>	
Considerations	
Additional Variables	
<b>Placebo effect:</b>	
<i>What negative effects can a placebo have?</i>	
<b>Confounding variable:</b>	
<i>What are some examples of confounding variables?</i>	

<b>Random assignment:</b>	
<p>How is this different from a random sample?</p> <p>What is the purpose of random assignment?</p> <p>Is this only used in the experimental method?</p>	
<b>Bias</b>	
<b>Participant bias:</b>	
<p><i>What are some examples of participant bias?</i></p>	
<b>Experimenter bias:</b>	
<p><i>What are some examples of researcher bias?</i></p>	
<b>Single blind:</b>	
<b>Double blind:</b>	
<p><i>When is it appropriate to use one or the other?</i></p>	

# Statistical Reasoning

Descriptive Statistics		Inferential Statistics	
<b>Descriptive Statistics</b>			
Measures of Central Tendency			
<b>Mean:</b>			
<b>Median:</b>			
<b>Mode:</b>			
<i>Which measure of central tendency is most impacted by outliers?</i>			
Measures of Variation			
<b>Range:</b>			
<b>Standard deviation:</b>			
<i>Explain standard deviation in a way that makes sense to you.</i>			
<b>Normal curve:</b>			
			
<b>Percentile rank:</b>			
<i>Explain percentile rank in a way that makes sense to you. Give an example if helpful.</i>			

Skewness	
Bell Curve- Negative Skew	Bell Curve- Positive Skew
	
What should you be paying attention to when deciding what type of skew it is?	
Bimodal Distribution	
<b>Bimodal distribution:</b>	
Give an example of a bimodal distribution.	
Inferential Statistics	
What factors influence whether data can be generalized?	
<b>Statistical significance:</b>	
What does statistical significance mean?	
<b>Effect size:</b>	
What does effect size communicate?	

# Ethics in Research

Laboratory Setting	
What limitations and benefits does the laboratory setting have for research?	
Institutional Review	
Institutional review:	
What is the importance of institutional review?	
Ethical Guidelines	
Informed Consent	
Informed consent:	
Informed assent:	
Protection from Harm	
Protection from harm:	
Confidentiality	
Confidentiality:	
Debriefing	
Debriefing:	
Deception:	
Confederate:	