Unit 2 Research Methods

True/False? 1. 2. 3. 4. 5. 6. 7. 8. 9. 10.

Flaws we have to overcome in Research:

 <u>Hindsight Bias</u> is the tendency to think that past events were more predictable than they actually were.
 Oversantidence:

2. Overconfidence:

3. Confirmation Bias: A tendency for people to accept information that confirms what they want believe
4. Hawthorne Effect:

IRB (Institutional Review Board): Every experiment must get reviewed and permission from the IRB.

Animal Research:

Yes: Otherwise important issues could not be investigated. Relativity little animal research involves pain or harm. NO: Animals are entitled to the same rights as humans. Animal studies are often trivial or may not apply to humans.

Ethical Guidelines

Peter Piper Cried When Charles Darwin Died Protection of Participants Privacy Consent Withdrawal, Confidentiality Deception Debriefing

- **<u>1. Protection from Harm:</u>**
- 2 Debriefing:
- 3. Privacy:
- 4. Informed Consent:
- 5. Deception:
- 6. Right to Withdrawal:



For each of the following studies, please indicate whether you personally consider it to be ethical or <u>unethical.</u>

1. A social psychologist sits in a crowded bar all evening and records the number of people who come into the bar alone, and who either leave alone or with someone else. The researcher also records the time they come in and the time they leave. □ ethical □ unethical □ cannot decide 2. A researcher wants to administer a new drug hypothesized to affect aggressive behavior. He chooses prison inmates to be his participants, reasoning that aggression is more common in prisons. In order to persuade prisoners to participate, he promises them favorable letters to their parole boards; these letters might well facilitate earlier release. □ ethical □ unethical □ cannot decide 3. A team of researchers is interested in studying helping behavior. They stage a scene in a subway in which a confederate falls off his seat and bleeds from the mouth. The dependent variable is how quickly bystanders help the "victim." The bystanders are never told that they were part of an experiment. □ ethical □ unethical □ cannot decide

Milligram Experiment:



Stanford Prison Experiment



Tuskegee Syphilis Experiment:



Rosenhan Study



Terms used in Research

Theory:

Hypothesis:

Null Hypothesis: states that there is no relationship or difference between two sets of data.

Independent variable (IV)

Dependent variable (DV) Aspect of behavior thought to be affected by independent variable. **Experimenter group:**

Control group:

<u>Confounding Variables</u>: Factors besides the IV that might affect the DV, hence they need to be controlled. Replicate:

Validity:

Internal Validity: The controlling of ALL variables, except the one being deliberately manipulated by the researcher **Internal Reliability**: The consistency of a measure within a test (i.e. all items need to be

measuring the same thing)

Single Blind Experiment:

Double Blind Experiment:

Random Sample:

Rahdom Assignment:

How would you draw a random sample of participants if you were surveying: Placebor high school classmates?

Formation of Hypotheses

A researcher always begins an investigation with a testable statement known as a hypothesis. The aim of an investigation is to work out whether the hypothesis is true or not true. Hypothesis have to be written in a very precise way. The need to contain three things:

1.Both conditions of the IV.
 2.The DV
 3.The word 'significant'.

*The reason that we use the term significant is that we need to find out whether the differences between two conditions are big enough for us to claim that there is a real difference. For example if we find that the group who drink are 3 seconds slower than the group that don't drink, is this difference big enough? When we have gathered the data we perform a statistical test which works out the probability that two sets of data could have happened by chance. In psychology if there is less than a 5% chance then we accept the hypothesis as we are able to claim that the results are significant (more about this later



Figure 5.1 Reliability and validity. (Source: Open University, 1979, Classification and Measurement, DE304, Black 5, The Open University, Million Keynes, p. 68)

For the following statiment) of leads approvide an operational definition for the underlined words. While you are doing this keep in mind that an <u>operational</u> definition is one makes it clear how the <u>Researcher</u> should go about measuring the process, activity, or thing. EG. Hunger for example might be defined as "hours without eating" When you word statements carefully with an operational definition you make it possible for others to replicate your study.

1. The teacher wants to find a way to help make Billy act more <u>friendly</u> toward the other children.

Confounding Variables

Circle the confounding variable in each of the examples below:

1. The researchers were interested in the effects of time of day on memory recall. They put all the young people in the morning condition and all the older people in the evening condition.

2. The researchers were interested in the effects of age on memory recall. They tested all the young people in the morning and all the old people in the evening.

3. Researchers were looking at the effects of noise on concentration. There were two conditions and participants were either in the noisy or quiet condition. When the researchers were conducting the

quiet condition the thermostat broke on the radiator and the room was very stuffy and airless. Research Methods:

3 Categories (Descriptive, Correlational and Experimental)

		•	_ /
Methods	Benefits:	Drawbacks:	
Survey Method	Cheap, Large amount of information quickly	People lie, False Consensus	1
		Effect: A tendency to	Pe
		overestimate the extent to which	
		others share our beliefs.	
Naturalistic		Does not explain behavior. CanIt	
Method		explain cause and effect	
Modilou		observational bias	
			L
-			1
Correlational	Determines relationships between 2 variables. Predicts future		
Method	behavior.		ן ן
			/
			E
			E
Cross-Sectional		Increased chance of error, very	1
Method		costly	
			[
			[
Experimental or	The only study that can determine the cause and effect of behavior.		[
Laboratory			
Method			



Summarizing Quantitative DataGraphs are a useful way of summarizing data which enable psychologists to easily see trends or patterns in data.

Three graphs which are commonly used to display quantitative data are



Histograms	Bar Graphs	Scattergram					
Psychologists use research methods and techniques to							
gather and mal	gather and make sense						
of the data they produce. The data they collect can be							
either quantitat	tive or						
qualitative. Quantitative data have a <u>numerica</u>							
<u>basis (</u> e.g. time in seconds, stress							
ratings), whereas Qualitative data are <u>non-</u>							
numerical (e.g. verbal reports of how research							
participants feel about something).							

Frequency Distributions			Mode
Frequency:	Score	Frequenc y	Median
Frequency distributions:			(+) Positively Skewed Distribution
What type of graph would you use to show a frequency distribution?			
			Mode Median
<u>Scores on Quiz:</u> Copy them and then put them on the chart			(-) Negatively Skewed
What can you conclude?			Distribution
Measures of dispersion			Which is best (mean, median, or
Measures of central tendency (mean/median/mode) are used to			modej:
the set. However in order to give a fuller picture, we need to know			If you are looking at housing costs in a
how spread out (how dispersed) the scores are.			community which one would you use and
			why?
TO FIND THE MEAN FOR THIS SET OF NUMBERS: 13, 18, 13, 14, 13, 16, 14, 21, 13 average the set of numbers:			
The "mean" is the "average". To find the mean, you add up all the numbers and then divide by the $(13 + 18 + 13 + 14 + 13 + 16 + 14 + 21 + 13) \div 9 = 15$			If the data is skewed because of the
number of numbers. Note that the mean isn't a value from the original list. This is a common result. DO NOT assume that the mean will be one of the original numbers.			outliers which method would be best and
FOR AN ODD NUMBER OF VALUES: 1,5,2,8,7 Sort the numbers 1, 2, 5, 7, 8			wnyr
The "median" is the "middle" value in the list of numbers. To find the median, your numbers have to be listed in summarical			
order, so you may have sort the list first. TAKE THE AVERAGE OF THE TWO MEAN NUMBERS: (5+7)/2 = 6			
TO FIND THE MODE FOR THIS SET OF NUMBERS: 13, 18, 13, 14, 13, 16, 14, 21, 13			Outliers: Or extreme, "way out" data
The "mode" is the value that occurs most often. If no number is repeated, then there is no mode to the list of the			that are significantly different from the majority of the data, have what effect on
			, , , , , , , , , , , , , , , , , , ,

<u>**THE RANGE**</u> – this is simply the difference between the highest and lowest scores in a set of values. 1 is then added if all the numbers are whole, 0.5 is added if scores have halves, 0.1 is added if scores contain 1 decimal place, 0.01 if there are 2 decimal places etc.

What are the	e disadvantages	of the Range?
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- 1.
- 2.
- 3.

Find the range for the following set of scores:

1.Age at which Ps claim to have 'been in love' 21 19 22 18 25 21 2.Amount spent on travel, per day (£) 8.5 9.5 17.5 12.5 14.5

Standard Deviation and Variance

Deviation just means how far from the normal Standard Deviation

<u>The Standard Deviation</u> is a measure of how spread out numbers are.

Its symbol is $\boldsymbol{\sigma}$ (the greek letter sigma)

The formula is easy: it is the **square root** of the **Variance**. So now you ask, "What is the Variance?"

The Variance is defined as:

The average of the **squared** differences from the Mean. To calculate the variance follow these steps:

- •Work out the Mean (the simple average of the numbers)
- •Then for each number: subtract the Mean and square the result (the *squared difference*).
- •Then work out the average of those squared differences.

The Normal Distribution Curve



So a standard deviation is the measure of the spread of scores around the

mean. The main features of a normal distribution graph are always the same what changes is the standard deviation depending on what normally distributed data is represented.

Try and work out what the following standard deviations or scores would be: (directions to the left)

1. The mean on an IQ test is 100 and the standard deviation is 15 what would be the score of a person who is two standard deviations above the mean?

Z score is a unit that measures the distance of one score from the mean.





Probability or P Value



Probability, or p, is expressed as a number between 0 and 1. 0 means an event will not happen, 1 means that an event will definitely happen. The P value will always be found to be between 0 and 1 due to the way in which it is calculated. To calculate the probability that a particular outcome will occur, it has to be divided by the number of possible outcomes.

One way to work out the probability of something occurring is to use this formula:

Probability = <u>number of particular outcomes</u> number of possible outcomes

Sometimes it is a little more complicated to work out the probability of something. For example, there may be a probability that one in nine of the entire population will develop cancer at some point in our lives. However, the probability of us doing so is greatly increased by other factors such as lifestyle choices (e.g. diet and smoking). In this case, the researcher would need to break down the sample into groups according to these other factors. This enables the psychologist to work out conditional probability - the probability of something happening if something else occurs.

<u>A significant result is one where there is a low probability that</u> <u>chance factors were responsible for any observed difference,</u> <u>correlation or association in the variables tested.</u>

The question is how large an effect (difference or relationship) is required for psychologists to conclude that a result is significant (i.e. not due to chance)? Psychologists have concluded that for most purposes, the 5% level of significance will be used (p=0.05) David Myers presents two studies on the relationship between breast-fed babies and intelligence scores or social class. Working within that scenario, develop a hypothesis and show how the following terms would apply in an original experimental design that you create.

1. Hypothesis:

2. Operational Definition:

- 3. Control Group:
- 4. Random assignment:
- 5. Double-Blind procedure:
- 6. Independent Variable:
- 7. Dependent Variable:
- 8. Confounding Variable: