PSYU3351 SUMMARY

Week 1: Introduction to research methods

THE SCIENTIFIC METHOD

Scientific method	Method of acquiring knowledge that uses **observations** to develop a **hypothesis**, and then uses the hypothesis to make logical **predictions** that can be **empirically** tested by making additional, systematic observations
Important principles of scientific method	• *Empirical*: answers obtained by making observations • *Public*: makes observations available for evaluation by others; others should be able to repeat same step-by-step process that led to observations so that they can replicate results for themselves • *Objective*: scientific answers are obtained without influence by researcher's biases or beliefs

Steps of Scientific Method

1: observe behaviour or other phenomena	Causal or informal observations **Inductive reasoning**: uses a few specific observations to generate a general hypothesis
2: form a hypothesis	Identifying variables associated with your observation **Hypothesis** = statement that describes or explains a relationship between or among variables; a proposal to be tested and evaluated • *Logical*: follows from and is consistent with past theory and research • *Testable*: variables are observable, assessable, measurable • *Refutable*: can be shown to be false • *Positive*: state that some state of affairs exists (directional/ non-directional) • E.g. there is a positive relationship b/w shame & narcissism
3: use hypothesis to generate a specific testable prediction i.e. research hypothesis	Take hypothesis and apply it to a specific, observable, real-world situation **Deductive reasoning** = uses general statements to generate specific predictions **Research hypothesis** = refers to specific measures, situations or event that can be directly observed • E.g. scores on Shame scale X will positively predict scores on Narcissism scale Y
4: evaluate the prediction by making systematic, planned observations	*Empirical method* This is the actual *research* or *data collection* phase of the scientific method Goal: provide a fair and unbiased test of the research hypothesis by observing whether the prediction is correct
5: use observations to support, refute or refine the original hypothesis	Compare actual observations with predictions that were made from hypothesis

Quantitative v qualitative research

Quantitative research	Based on measuring variables for individual participants to obtain scores, usually numerical values, which are submitted to statistical analysis for summary and interpretation E.g. surveys answer qus such as *how many, how often?*
Qualitative research	Based on making observations that are summarised and interpreted in a narrative report Produces findings not arrived at by means of statistical procedures or other means of quantification

	Examines **types** of events and interactions; what *qualities* make up particular constructs? E.g. interview

Steps of research process

1. Find a research idea	Select a topic and search literature to find an unanswered qu Identify a general topic that you would like to explore and review the background literature to find a specific research idea or qu
2. Form a hypothesis	Form a hypothesis, or tentative answer, to your RQ
3. Determine how you will define and measure your variables	Identify the specific procedures that will be used to define and measure all variables. Plan to evaluate the validity and reliability of your measurement procedure.
4. Identify the participants or subjects for the study, decide how they will be selected, and plan for their ethical treatment	Decide how many participants or subjects you will need, what characteristics they should have and how they will be selected. Also plan for their ethical treatment.
5. Select a research strategy	Consider internal and external validity and decide between an experimental and a descriptive, correlational, nonexperimental, or quasi-experimental strategy
6. Select a research design	Decide among between-subjects, within-subject, factorial or single-case designs
7. Conduct study	Collect data
8. Evaluate data	Use appropriate descriptive and inferential statistics to summarise and interpret results
9. Report results	Use established guidelines for format and style to prepare an accurate and honest report that also protects the anonymity and confidentiality of the participants
10. Refine or reformulate your research idea	Use the results to modify, refine, or expand your original research idea, or to generate new ideas

RESEARCH STRATEGIES

Research strategy	General <u>approach</u> to research determined by the kind of question that the research study hopes to answer 5 research strategies summarised below
Research designs	General plan for <u>implementing</u> a research strategy Specific whether the study will involve groups or individual participants, will make comparisons within a group or between groups, and how many variables will be included
Research procedure	An exact, step-by-step description of a specific research study
1: Descriptive research strategy	*Purpose:* produce a **description** of <u>individual variables</u> as they exist within a specific group *Data*: a list of scores obtained by measuring each individual in group being studied E.g. What is the typical number of hours spent studying each week? How many people are planning on voting for labour?

2: Correlational research strategy	*Purpose*: produce a **description** of the relationship between 2 variables Do not attempt to explain the relationship *Data*: uses one group of participants and measures two variables for each individual E.g. is there a relationship between exam results and time spent on Facebook?
3: Experimental research strategy	*Purpose:* produce a cause-and-effect **explanation** for the relationship between two variables *Data:* create two treatment conditions by changing the level of one variable; measure a second variable for the participants in each condition E.g. do changes in social media use cause changes in depressive symptoms in young adults?
4: Quasi-experimental research strategy	*Purpose:* attempt to produce a cause-and-effect explanation but fall short *Data:* measure before/ after scores for one group that receives a treatment and for a different group that does not receive treatment • Attempts to limit threats to internal validity and produce cause-and-effect conclusions (like an experiment), but lacks one of the critical components—either manipulation or control—that is necessary for a true experiment • Typically compares groups or conditions that are defined by a nonmanipulated variable - May be impossible to randomly assign e.g. sex - May be theoretically possible but unethical e.g. smoker v non-smoker
5: Non-experimental	*Purpose*: produce a **description** of the relationship between 2 variables Do not attempt to explain the relationship *Data:* compares two or more groups of scores, measuring only one variable for each individual E.g. a researcher would like to determine whether the verbal skills for 6-year-old girls are different from those for 6-year-old boys (Is there a relationship between verbal skills and gender?)

Data structures and statistical analyses

Descriptive studies	Intended to summarise single variables for a specific group of individuals Numerical data: statistical summary usually consists of a mean, or average score Nonnumerical classifications: summary is typically a report of the proportion (or percentage) associated with each category
Correlational studies	Measures two different variables (two different scores) for each individual in a single group and then looks for patterns within the set of scores Numerical scores: data evaluated by computing a correlation (e.g. Pearson correlation) Nonnumerical classifications: statistical evaluation is usually a chi-square test
Experimental, quasi-experimental, and nonexperimental studies	Involve comparing groups of scores Usually, comparison involves looking for mean differences or differences in proportion Because these three strategies produce similar data, they also tend to use similar statistical techniques To evaluate mean differences: t-tests and analysis of variance To compare proportions: chi-square tests