Lecture One

Friday, 11 March 2016 5:57 PM

UNITS AND ASSESSMENTS

AT1 – Research Design & Implementation (Draft) – 750 words; 10% (DUE FRIDAY 29/4 5pm)

AT2 – Research Design & Implementation (Final) – 1500 word; 30% (DUE FRIDAY 27/5 5pm)

AT3 – Plain Language Statement – 750 words; 20% (DUE FRIDAY 27/5 5pm)

MCQ exam; 2hr; 40% (only LOs are examined!) **LO** = Learning Objectives

Study Guides for each week – keep up with this

FAQs most weeks

Textbook chapters – keep up

Additional readings – why not

EVIDENCE IN PSYCHOLOGY

A contemporary framework for translational, ethical, evidence-based psychology.

TRANSLATIONAL = Creating change through knowledge

WHY DO WE CARE?

Evidence-based practice is our goal, and our subject matter is complicated

But good evidence is hard to find… and good research is hard to do… and 'evidence' depends on beliefs, assumptions, values/goals!

SCIENTIST-PRACTITIONER (SP) MODEL

The three ideal roles of the SP are:

1. Intelligent and discerning consumers of empirical evidence (research evidence)

2.Evaluators of their own activities

3. Researchers who contribute new data from their own settings

TRANSLATIONAL RESEARCH = practice is empirically-based**,** empirical evidence is practically oriented

CANONS OF SCIENCE

Realism + Rationalism = Understanding = Prediction

Determinism – Discovering causes within an orderly and predictable natural universe that obeys the laws of cause and effect

Empiricism – Discovery occurs best through systematic observation/testing/learning (not from authority, anecdote, rumour…)

Parsimony – Simple explanations are favoured. Fewest assumptions, no mysterious agents = better (Occam's Razor)

Testability – Predictions involving operationalized definitions that allow confirmation (of falsifiability)

LOGICAL POSITIVISM = empiricism + determinism

We can only investigate what can be observed

Verifiability principle: A statement is only meaningful if it can be verified (TvF) through direct empirical observation or through logic

Aesthetics, ethics, religion, existential Qs, etc.?

BUT what about 'depression' – is it observable?

Psychology's answer – yes, but only if the construct can be operationalized and thus observed/measured directly (what's the problem with this?)

Fallibility of evidence – Yes, facts inform theories BUT theories/expectations/values also influence facts!

Fallibility of reasoning – We aren't as dispassionately logical (or even as systematically logical) as we'd like to believe!

WEEK	CLASS	SEMINAR	ASSESSMENT
1	Evidence in Psychology		
2	The scientific approach	Research design & the assignments	
3	Validity, reliability, and measurement	Research design & the assignments	
4	Misinterpreting results. Threats to validity	Assignment 1/2	
5	Experiments and quasi-experiments	Assignment 1/2	
6	Non-experimental research designs	Assignment 3	
7	Ethical research and practice in Psychology	Assignment 3	Submit AT1 DRAFT Friday 5pm
8	Factorial designs and interpreting effects	Interpreting results in factorial designs	
9	Asking questions and quantifying responses	Interpreting results in factorial designs	AT1 DRAFT returned
10	Introduction to statistics – Describing and comparing	Descriptive statistics	
11	Qualitative research in Psychology	Descriptive statistics	Submit AT2 FINAL & AT3 Friday 5pm

Tutorial One

luc@deakin.edu.au

Friday, 11 March 2016 6:30 PM

OVERVIEW OF THE ASSIGNMENTS
Research Design and Implementation Essay
Draft (Assignment 1) ≈ 500 words; 10%
Final (Assignment 2) ≈ 1500 words; 30%
Draft (AT1) submission deadline: Friday 29th April 5pm
Final (AT2) submission deadline: Friday 27th May 5pm
Assignment 3 – Plain Language Statement ≈750 words; 20%
First and only submission deadline: Friday 27th May 5pm
Use same research question as Assignment 1/2 (all three assignments must respond to the same question!)
Consider your research design choices from an ethical and practical perspective in order to write a PLS (see Seminar #3)

CAUSATION AND EXPLANATION
Most research aims to establish or test CAUSATION
This is achieved by testing whether changes to one (or more) variable (the independent variable - IV) leads to change in a second variable (the dependent variable - DV)
The criteria for causation are:
1. change in the IV consistently co-occurs with change in the DV
2. change in the IV happens before change in the DV
3. there are no better alternative explanations for the relationship

RESEARCH DESIGNS
Research designs convert a research question into an empirical test that can be carried out logically, meaningfully, feasibly (and ethically)
This is important for two obvious reasons:
(i) a research question ultimately needs to be put into practice (so it needs to be 'implementable'), and
(ii) interpretability and relevance of the results will be entirely dependent on which research design was used and how it was implemented

Experimental - IVs are manipulated, effects on DVs are measured to infer causality

Observational (non-experimental) - IVs are observed/measured, associations with other variables are measured to infer differences, interrelationships, etc. (causality is only speculative)

True Experiments - All IVs are manipulated by the researcher (this is achieved by randomly assigning participants to different levels of each IV), the IV manipulation typically includes a no treatment placebo control (this controls irrelevant non-treatment effects such as person differences, confounds and artefacts)

Person differences = individual differences relevant to the relationship between the IV and the DV
Confounds = third variables – inadvertent variables common to both the IV and the DV
Artefacts = disruptions/'noise' – things that potentially affect all participants in all IV conditions

GOOD
- high internal validity
- causality can be inferred
- direction of causality can be inferred but only in so far as person differences are eliminated and irrelevant non-treatment effects controlled
- note that matching of groups on important 'person' differences can be applied instead of random assignment, but this raises issues!

BAD
- often low external validity (e.g., what happens in a controlled situation, eg in a lab, might not happen in the real world)

For example, people aren't normally 'assigned' to a boot camp and then monitored; they self-select… moreover, a boot camp is a poor proxy for 'exercise/fitness'…

Quasi-experiments

Person-by-treatment experiments - at least one IV is manipulated (treatment effect), at least one IV is observed rather than manipulated (person effect)

GOOD
- improves external validity by examining generalizability of results (interaction effects)
- sometimes it is necessary because an IV of interest is an intact (pre-determined) group (the person variable)

BAD
- internal validity is weakened in relation to 'person' variable

Natural experiments - IVs are manipulated but only as a result of an arbitrary naturally-occurring event/circumstance
N.B= the IV is not a person effect because the IV isn't a person variable and the manipulation is arbitrary (like naturally-occurring random assignment)

GOOD
- high external validity (naturally occurring)
- easy/opportunistic research
- can use archival data… retrospectively
- often is necessary practically and ethically

BAD
- internal validity is weakened

Observational designs -

Cross-sectional - a snapshot in time

GOOD
- convenient and quick
- can identify risk factors and protective factors
- use self-report surveys, archival data…with correlational analyses

- or use IV (group) comparisons of a DV… like an experiment

BAD

- no manipulation of IVs; no random assignment…
- no control over person differences or confounds
- worst: COHORT effects (e.g., is it an Age effect or Generational change?)
- no ability to infer causation, only association
- third variable and reverse causality
- often use convenience samples (see later)

Longitudinal (cohort) – treatment (IV) occurs first, then 'DV' sampled (tracked) forward in time

GOOD

- high external validity
- great for developmental change-over-time research
- control of cohort effects
- cause-effect is possible due to time order

BAD

- no manipulation of IVs; no random assignment…
- no control over person differences or confounds
- time-consuming and expensive (so small N and short t)
- selective attrition and incomplete data

Case-control – outcome (DV) occurs first, then potential IVs measured retrospectively and compared with a control group

GOOD

- high external validity
- great for determining risk (how do cancer patients differ from matched controls in terms of history of …?)
- very efficient – few participants needed because it targets the group of interest (important for rare conditions)
- attrition isn't a problem; ethics isn't a problem (don't need to force people to smoke, or to get cancer!)

BAD

- no manipulation of IVs; no random assignment…
- no causation can be inferred
- cohort effects may confound the results – it depends on the control group you've used, the matching you've applied…

Conjoint designs

Longitudinal RCT (Experimental + Longitudinal) = The IV is manipulated experimentally (RCT) and the outcome (DV) is tracked forward in time (longitudinal).

Cross-sequential (Cross-sectional + Longitudinal) = Compare differences between groups or associations between variables within the same group (cross sectional) and track these differences or associations forward in time (longitudinal).

Lecture Two

Friday, 18 March 2016 11:57 AM

RESEARCH STATEMENTS

Science - Discovering laws and developing theories
Laws - Universal, deterministic relationships, without qualification… truths
Theories - truths with boundary conditions, qualification, limitations, circumstances (especially if there are multiple interacting causes)

Stereotyping, despite its negative connotations, is an adaption, one that increases the speed and efficiency of decision-making - *Theory*
Attractiveness ratings of women peak at a waist-to- hip ratio of .57 - *Theory - very fuzzy, could be either, more likely law*
The change in a stimulus intensity that will be just noticeable is a constant ratio of the original stimulus intensity - *Law*

INDUCTION - Making a judgement on something based on prior experience
e.g. seeing 'n' white swans, and assuming all swans are white

Flaws of Induction

- How many observations are necessary before induction can be done?
- Over how many diverse contexts do white swans need to be seen?
- Do you apply super-strict criteria, or do you be lenient?
- Should probabilistic generalisations be made?

Developing Research Ideas Through Inductive Reasoning

- Noticing distinctive features of case studies (e.g. patients with 'X' seem more likely to ____ based on ____)
- Noticing paradoxial/counterintuitive incidents (e.g. price increases can precede spikes in sales, inconsistent reinforcement is less prone to extinction)
- Noticing what practitioners/experts have (or do) in common

DEDUCTION - Improving on induction by making novel, unique, testable, unambiguous, clear predictions with operationalized terms, variables, constructs etc.
1. Major premise (rule or law defining a set) e.g. all dogs have four legs
2. Minor premise (rule about a member of the set) e.g. all chairs have four legs
3. Conclusion (valid or invalid) e.g. all dogs are chairs

Hypotheses - Predictions that are specific to particular circumstances as predicted by the theory and inconsistent with competing theories…

Types of Hypothesis Testing
Validation – testing a theory by confirmation
BUT: positive test bias; competing theories; you can't prove theories!
Falsification – testing a theory by disconfirmation - Theories can't be proven, but can be disproven
BUT: not often done!... and all theories have exceptions
Qualification – identifying boundary conditions - That's what theories are all about!
BUT: what if the theory is simply incorrect? When does qualification make way for falsification?

Flaw of Deductive Reasoning
Falsifiability – You can't ever prove a theory through replication/confirmation (e.g., White Swans), you can only disprove it! (Popper) – that's the key criterion of science.
Hypotheses need to be able to disconfirm AND differentiate the theory from competitor theories (e.g., counterintuitive & distinctive tests as best!)

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Formal Argument

1. Premise 1 (A1 has property B)
2. Premise n (An has property B)
3. **Induction** (all A's have B; e.g., law)
4. Premise (initial condition; 'x' is an A)
5. **Deduction** (prediction; Ax has property B)

COMPARING THEORIES

Internal consistency is not enough! We can't compare one theory against the internal logic of another… nor is confirmation sufficient!
• "The free market works because it improves standards of living"
• "Democracy is superior because everyone gets a say"
• "Public education empowers all of us with the knowledge to make informed decisions"

We need to get behind the explanation! We need independent/external criteria, such as:
Clarity/simplicity/parsimony **-** Simple and transparent components, no mysterious agents, few assumptions (Occam's Razor)
Testability/falsifiability **-** Testable and unambiguous predictions
Empirical support **-** Unambiguous findings, replicable findings
Fruitfulness **-** Stimulates research and leads to new discoveries, explains unresolved phenomena and inconsistencies of other theories, unifies theories

MISUSE OF LOGICAL REASONING - LOGICAL FALLACIES

Appeals to Feelings

- Manipulating feelings rather than using a logical argument.
- Force
- Appeal to pity

- Appeal to improper authority (e.g., under guise of presenting both sides)
- Appeal to tradition

Attempts to Distract
- Distraction away from the evidence and the argument.
- Ad Hominem argument (attacking the person)
- Irrelevant conclusion (but everyone else is speeding more…!)
- Straw-man argument (a set-up)

Misinformation
- Argument from the Negative (if X isn't 100% correct, then Y must be)
- Argument from Ignorance (you haven't proven it's harmful, therefore…)

Generalisations
- Over-generalising from your evidence.
- Hasty generalisations (I failed, my friends failed – everyone must have failed!)
- Appeal to popularity (everyone is guilty of this!)
- False dilemma (you're either with us or against us)

Irrelevant connections/irrelevant conclusions
- When links between the evidence and the claim have not been established.
- Slippery slope (where will it end!?)
- False Cause (the basis of superstitions)
- Circular argument (tautology)
- Non sequitur / Begging the Question
- Loaded question (have you stopped taking drugs?)