Tips for the semester:

Go to Tutorials – they will help you a lot with Case studies, the Research Proposals and the Exam!

Do your assignments as a group – three brains are better than one! Consider this with the case studies as well (especially case study B).

Lecturer does tips for assessments throughout. Will also give tips for the exam in the last few lectures particularly the last lecture.

PART A of Research Proposal: if you follow criteria and work hard on it you'll do great ☺ this will be useful to make sure your marks are high enough in Part B as well

PART B of Research Proposal: Make sure you have a lot of detail! If you don't have enough information you won't get the mark you want. Follow the criteria and the Lecture's/Tutors' tips as well – it will help a lot.

Tips for the Exam:

Listen to Lectures! She will give you tips from time to time about what it important to your exam!

Part A: All exams in the past are similar, she tests on the most important things in researching every time. Look at past exams in your study – it will give you a great understanding of what you'll be tested on and why!

Look at things like: Question hierarchy; Sample design (including equation); Scaling (nominal, ordinal, etc); Validity and Reliability (including examples of); and Experimentation (True vs. Quasi/ exploratory, explanatory, descriptive)… {all things that are important to research design!

Make sure you're familiar on the steps to analysing ANOVA, regression and/or t-tests (these have been in exams in the past) → To know which one you really need to focus on your Lecturer may give a hint on which analysis tool will be on the exam (focus on that one!)

Part B: Think of what your strength in theory of this course are. Questions that you answer will always be the same – you just have to apply them to the articles she gives you! ☺ When evaluating look at: research question; METHOD (this is most important to evaluate); and analysis.

- ➔ **Example of Part B study (how I planned out my answers) are provided at end of notes.**

Lecture 11

Most research not feasible to measure all people in the population
Census means all people measured within population.

Sampling measure subset of population and try to estimate what is happening

Basic idea - some population elements provide useful information on entire population
Element - 1 part of population
Sample - subject of population

Think who you want to talk to in research → that us population

Adv

- Economic and time (in comparison to census)
- Quality can be better than census (resource constraints minimized in sampling)
- Some situations require sampling
- Only process possible if population is infinite

Diadv

- Any sample we draw may not be of population to which drawn
- Non-representative sample can lead to sample statistics that are incorrect estimates of population parameters.

A good sample has…

- Accuracy - focus on bias, getting the right people
- Precision - amount of error willing to accept around mean
- How well it presents characteristics of population

Precision - amount of difference willing to accept around the true mean.
Precision rates can affect how many people you need in the sample

Steps in sampling:

1. What is relevant population?
- In individual level variables can look at own employees/customers
- In organisational level variables need to look at other organisations
- Apparent in management question.
- Consider who you are trying to speak to.
2. What is the sampling frame?
- list of element in population
- Employee list if looking at employees.

➔ Think whether a list is available! (important)

3. What are the parameters of interest?
- Population parameters: descriptors of variables of interest in the population.
- Sample statistics: descriptors of the measure of relevant variables computed from sample data. Estimators of population parameters.

- Mean of population = [population parameter.
- Mean of sample = sample statistics

- Inferences: probability statements concerning population, based on the behaviour of sample.

➔ **Think whether client would have the assumption that report would apply to whole population**

  - ➢ Can they put findings accurately across all population?
  - ➢ Do I or the client want to infer that this data goes across all population?

Before next step answer these 2 questions!

➔ Do I have a list of the population?

➔ Do I want to infer the findings to the rest of the population?

4. What is the type of sample?

Sample type	Definition
Probability	Every element in population has known non-zero probability (1/n) of selection. N is equal to the number of population)

Non-probability	The probability of any number of population being chosen is unknown. Large risk of bias results.

- If don't have a list cannot use probability sample
- If want to infer to population should use probability sample, otherwise result have large risk of bias.

5. What sample size is needed?

- Not ratio to population
- Amount of variation in population determines this.

6. How much is it going to cost?

- No important for our assessment piece.
- Expensive to buy Aus. Respondents as there are less of us in comparison to other countries.

Sampling types

		Representative Bias	
		Probability	**Non-probability**
Element selection	**Unrestricted**	- Simple random sampling	- Convenience sampling
	Restricted	- Systematic sampling - Stratified sampling - Cluster Sampling	- Judgemental Sampling - Quota Sampling - Snowball Sampling

Non-Probability sampling Techniques:

(bias against people who are unique)

Convenience sampling

- Accessing people who are close to you
- Can be used for focus groups, pretesting questionnaires and pilot tests.

Judgment sampling

- Convenience sampling but also involves researcher to decide who is in or out of the study. (who they want to)
- They will usually have a set of rules to reason why
    - E.g. there are two CEO's from different airlines and only want one so choose the one who is more open.

Quota sampling

- Put numbers on the type of people who they want to answer.
    - E.g. 50 girls under 35 and 50 over 35/ 50 boys under 35…etc.

Snowball sampling

- After survey, respondents are asked to identify others who belong to target population of interest. Subsequent respondents are selected based on the referrals
- Good when trying to get to hard to get to population

Probability Sampling

Simple random sampling

- Unrestricted – all have a known and equal probability of selection
- Has the risk of biases in sample – less likely than convenience sample but still possible due to lack of control.
- Lower precision

Systematic Sampling

- Sampling interval is determined by dividing the population by sample size and picking every k^{th} element.
- Keeps proportions of subgroups.

Stratified Sampling

- Think whether there are strata (groups who you want represented) split list into groups and randomly sample out the lists.
- Best statistically efficient technique
    - Best randomise data
- In strata there are similarities/ across stratas there are differences

Proportionate vs. Disproportionate Stratified data

Proportionate	Take number of people in each strata in proportion to population.
Disproportionate	Take number from groups not in proportion of population (e.g. maske equal across). Used to look at differences between groups, not get mean of overall group.

Cluster Sampling

- Similar to stratified but generally based on information such as location
- Target population divided into mutually exclusive and collectively exhaustive cluster then the sample is taken.

Errors associated with sampling:

- Random sampling errors – estimate bias (boost the sample size to decrease bias probability)
- Systematic errors (non-sampling errors)
    - Sampling frame error – list is out of date
        - Includes elements that are no longer in population/ does not include elements are in population
    - Non-response errors – when some of potential respondents included in sample do not respond
        - Issue when people not respond are unique
        - High response rates decrease probability that non-response bias is substantial.

Need to reflect on data don't have – who didn't get sampled?

Sample size

Judgement Approach – use instinct for how many people will need using experience

Confidence interval Approach – Based on the construction of confidence intervals around sample means or proportions using the standard error formula.

Factors of size of sample:

Variance – heterogeneity – variance in population (if similar can have smaller sample/ if differ should use larger sample)

Precision – how close to population does the estimate need to be?

Confidence level – 95% is the level we use in course – level of statistical confidence is required

Sample Size Calculation

$$n = \left(\frac{zs}{E}\right)^2$$

where

Z = standardized value that corresponds to the confidence level

S = sample standard deviation or estimate of the population standard deviation

E = acceptable magnitude of error, plus or minus error factor (range is one-half of the total confidence interval)[7]

$$n = (\sigma^2 \text{ x } z^2)/E^2$$

THIS IS THE EQUATION TO USE FOR SAMPLING:

Confidence level = 95% therefore the **standardised value is 1.96!**

(max - min of scale)/6

If sample is more than 10% of population:

= N x n (N – n – 1)

- **Think about the amount of employees that they have!**