Lesson 21

Target Populations and Sampling

"Who You Looking At?"

Well, just who are we looking at when carry out a psychology study? This is an important question because, in reality, we cannot study everyone at once. So whatever topic our study covers, we can often only look at one group of people – otherwise our study might be huge.

Obviously, it would be good to be able to say, "These findings apply to everyone" but highly unlikely we can ever say that. What do we mean by "everyone"? Everyone in the UK/Europe/the world? All age groups? Both sexes? All cultures? It is unlikely we could ever achieve this in any study we carry out. If we study, say, college students aged around 18 to 23, then we can only really claim that our findings apply to this type of person. It is possible that the findings apply to many other groups but we cannot be sure of that.

The Target Population

Instead, we need to be clear about who we are investigating and to whom we can claim our findings apply. The group of people we want to study will be our target group. This is also known as the target population.

The Sample

We cannot study everyone in our target population so we have to study a sample of them and we need to ensure that the sample is representative of the population if we want to conclude that our findings apply to that population.

Jot down an answer to this. What other characteristics of an 18 to 23-year-old group do you think we need to take into account if we want to say our findings apply to this group?

You might have suggested things like:

- Gender: 50 per cent of this group are male and 50 per cent female.
- Ethnic group: Asian, black, white British . . .
- Occupation: student, apprentice, worker, trainee . . .
- Geographic location: north of England or south of England . . .

This list could be much longer. The creation of a sample is known as sampling and **the aim of sampling is to create a sample that represents the target population** as far as possible. In this way, we can justifiably claim that our findings can be applied to (or "generalised to") all members of the target population.

Methods of Sampling

There are different ways to achieve a sample that represents a target population. To make things easier, we will consider a target population of Everytown College, a well-known institution of learning.

1. Opportunity Sampling

To make a start, we could simply go to Everytown College, approach people there and ask them to take part in our study. If they agree, we can proceed.

> ***Jot down an answer to this. We have set our target population as Everytown College students aged 18 to 23, so what two questions do we need to ask people before we include them in our psychology study?***

We need to ask:

- Are you a student at this college?
- Are you aged between 18 and 23?

If they say yes then we can move to the next stage by explaining what they have to do and carrying out the study. In opportunity sampling, we simply take advantage of any member of the target population who is on hand.

> ***Jot down an answer to this. Can you see any advantage or limitation to this method?***

Advantages of Opportunity Sampling:

- It is easy to achieve a sample.
- It is a cheap method.

- It can be tailored to the resources you have. If you have the time and space to involve 25 people in your study then you can continue to invite participants until you get 25. If you can cope with 100 then you can carry on till you have 100.
- This method can be useful in a pilot study when we want to know, for example, if the tasks we are asking participants to undertake are manageable rather than trying to establish the results of the tasks themselves.

Limitations of Opportunity Sampling:

- Although the sample consists of members of the target population, their other characteristics may not be representative of the target population – so, for example there may be far more females than males.
- People who are "convenient" are more likely to be those who often associate with the researchers – in the college example, psychology students carrying out a study are likely to mix with and know the people they approach. These people are likely to want to be helpful to the researchers and may produce behaviour they think the researcher wants to observe rather than a genuine response to the task.

Check Your Understanding. Write down your answers. Check them against the suggested answers in the ***Feedback*** section. Record your marks in your **Assessment Record**.

1. What phrase completes this sentence correctly: "We have to make sure that the people we approach in an opportunity sample are members of the _____.

- College
- Student population
- Target population [1 mark available]

2. Random Sampling

You read about random allocation in Lesson 20. Random sampling has many similar properties. The random sampling approach involves the following steps:

- Create a list that includes all of the target population: this is known as the sampling frame.
- Pick members of the target population from the list randomly until you have the proportion and number you require. So if there are 1,000 students at the college and you want 10 per cent, you pick 100 from the list.

Remember that "random" has a specific meaning – i.e. that every member of the target population has an equal chance of being chosen. You cannot just take the list of students and take the first 100.

Jot down an answer to this. Can you see why you cannot just take the first 100 on the list?

You might have said you cannot just take the first 100 because that would exclude the last 900 and so they have no chance at all of being chosen – so that contradicts the definition of random. In addition, there may be some sort of pattern to the people at the beginning of the list. You might not be aware of that pattern. For example, the list may be a list of names in alphabetical order. Although it sounds unlikely, studies have shown that people with surnames towards the end of the alphabet have different spending habits from those with surnames at the beginning of the alphabet; they are also more likely to take advantage of free offers. A possible explanation for this concerns the anxiety created over a long period of time by having to wait longer than others when names are used in things like school class registers.

Perhaps the list was constructed according to the date that students enrolled at the beginning of the year; it may be that those who enrol early are keener than those who enrol later. Taking the first 100 would bias the sample towards this type of person.

Unlikely as these two list effects may seem, they may be real and we have to avoid the effects of unknown patterns when we select a sample, so how are we to achieve a random sample? A popular method with names is to put each one on a piece of paper and into a container, shake them up and get someone to pick 100 out. This would mean each student has an equal opportunity of being selected. Alternatively, names often have numbers associated with them on lists like enrolment lists (e.g. "enrolment number", "student number" and so on). Computer software can often be adapted to pick 100 numbers randomly from number lists and their associated names can then be used.

Advantages of Random Sampling:

- This method is very likely to create a sample that is truly representative of the target population; for example, a random sample of 100 people from a sampling frame of 500 males and 500 females is very likely to create 50 males and 50 females. It would be rare to have a sample that was less representative than 47 of one and 53 of the other.
- Characteristics that we were not even aware of will also be chosen on a representative basis. For example if 75 per cent of the target population come from working class backgrounds

then the most likely outcome is that 75 per cent of the sample will come from the same background – and that is without us even asking people about their backgrounds. Of course, the social background of the population may have no effect whatsoever on the performance on the task in the experiment but if it does then this method leads to an accurate reflection of that effect.

- The sample is not biased towards being connected to the researcher in any way, as it might be with the opportunity sample.

Limitations of Random Sampling:

- Sampling frames may not even exist. For example if you want to sample all the pregnant women in Wigan this year, there will probably be no central list.
- Even if they do exist, obtaining a sampling frame is often difficult. For example, in the college example given above, data protection regulations prevent the college administration office from handing over a list of enrolled students. The best we can expect is that the office itself will pick 100 names from its list and write to each person asking if they will consent to have their names forwarded to the researchers. A recent alternative is that the office will send an email to the 100 students with a link to your website and ask them to click on it if they want to take part; your website can then offer contact details. Even this may be difficult as the office will expend time and therefore cost in doing this and so may decline to get involved.

Check Your Understanding Continued

2. True or False: an advantage of random sampling is that we can ask anybody to take part. [1 mark available]

3. Systematic Sampling

This involves selecting every n^{th} member of the population where "n" could be any number. For example, we might stop every 10^{th} person who comes into the Everytown College canteen. Or we might take every 15^{th} person on the list of enrolled students. It is important to start at a random point in the list to avoid unseen patterns again.

Advantages of Systematic Sampling:

- This method ensures that the complete breadth of the sampling frame is brought into the sample; every 10th item in a list gives items from the beginning, middle and end. Under "Random Sampling", above, it was pointed out that there might be a good reason why we should not just take the names from the beginning of the list. There is a small chance with random sampling that names from just one part of the list will be chosen. Systematic sampling prevents this.
- This method might be easier to carry out than random sampling because it is easier to determine every nth item than it is to apply techniques like pulling names out of a hat or adapting software to the sampling frame.

Limitations of Systematic Sampling:

- It is still possible that an unwanted pattern might emerge when using this method. For example, imagine that Everytown College uses tutor groups with equal numbers of students, say 20 per group and we gain permission to use the registers from these as a sampling frame – since that would cover all students. Imagine also that each register is divided into males, then females (perhaps not a common practice nowadays). If we want a sample of 1 in 20 and pick every 20th person then they will all be females or all be males, depending on our starting point. Of course, an astute psychology researcher might notice that the sample is entirely female but the worry in systematic sampling is that there may be a pattern that is not so obvious.

4. Stratified Sampling

In this method we set out to construct a sample that we know is representative of certain subgroups of the population. They are the subgroups we think are important to match. For example, if we are studying memory and we think that gender and age might be important influences on memory performance we want a sample that is representative of the gender and age of the target population. If we know that 35 per cent of students at Everytown College are males under the age of 20 then we build a sample that consists of 35 per cent males under the age of 20. If we know that 12 per cent are female and over the age of 40 then we build a sample that contains 12 per cent females over 40.

Advantages of Stratified Sampling:

- We can be assured that the sample represents the target population accurately on the subgroups we think are important.
- It can be combined with the other convenient sampling methods when we want to recruit each subgroup. For example, we might use systematic sampling to obtain the 35 per cent of males and opportunity sampling to obtain the 12 per cent of females.

Limitations of Systematic Sampling:

- A lot more work has to go into identifying the size of each subgroup in the population. We have to find an accurate sampling frame but that is only the start: the frame needs to specify the characteristics in which we are interested (e.g. male/female) for us to calculate the size of the sub-group and then we need to use another method to access people from the population with those characteristics. It is much easier to simply look at a sampling frame and then pick every n^{th} person (systematic sampling).
- We have to be able to identify subgroups we think are important in the first place and we may wrong about them. Perhaps age and gender are not important to memory.

Check Your Understanding Continued

3. What is the main objective of stratified sampling in helping us to create a sample that represents the population? [2 marks available]
4. Why should our sample be representative of the target population? [1 mark]

Feedback

Suggested answers to *Check Your Understanding*

1. . . . target population. [1 mark]
2. False. We can only ask those chosen by the random sampling method [1 mark]
3. To create subgroups that represent those found in the target population. [2 marks]
4. So that we can say that our findings can be applied to (generalised to) the target population. [1 mark]