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Introduction to Research Methods

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MGM 333

Part 1: Starting the research process

CH5: Sampling

Lecture 6

Chapter
05

Sampling





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Session Outline

Chapter
05

Session Outline

- ☐ Why sample?
- ☐ Population and sample
- ☐ Probability sampling
- ☐ Purposive sampling
- ☐ Summary.



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Why sample?

- ❑ Sampling is the process of selecting a few from the many in order to carry out empirical research.

- ❑ Sampling is used when it is not possible or practical to include the entire research population in your study, which is usually the case

- ☐ The method of sampling used plays a major role in any research investigation.
- ☐ Very often it is the characteristics, composition and scale of the sample that give weight to any findings that emerge from the investigation.

- ☐ You must take care when selecting a sampling technique; there are a number of different approaches to sampling and choice of approach should be influenced largely by the purpose of the investigation.
- ☐ You will need to demonstrate the appropriateness of the chosen sample to the nature and output of the research.

- ❑ It is totally inappropriate to engage in a small-scale, localized qualitative study then attempt to generalize from the findings.

- ❑ Likewise, it is inappropriate to engage in a large-scale, broad study and attempt to provide any real detail concerning individuals (unless it is a large-scale investigation involving many researchers investigating many people in a great deal of depth!).

- ❑ A rather simplistic rule of thumb is to assume that **quantitative research** will tend to use probability sampling techniques and **qualitative research** will tend to use purposive sampling.

- ❑ Remember that here when we are talking about qualitative research we are talking about in-depth rich pictures, not short detail collected from many in order to add detail to the quantifiable evidence gathered.

- ☐ Qualitative research may produce theoretical generalization, which means it is possible to generalize from,
- ☐ for example, a case study to a wider theory based on the findings of the case study.
- ☐ Replication of the events in the case study would then go on to add confirmation to the theory.

- ❑ There remains some conflict in the published literature on research methods concerning this particular aspect of the process.

- ❑ Payne (1990, 23) states that positivist and interpretivist researchers 'may have very different ideological roots but there is a common concern in ensuring that respondents are representative'.

- ❑ The word 'representative' needs to be used carefully. Interpretivists would argue that a sample need only be representative when commonalities are being sought; there are many occasions when participants are selected because they are different or extreme and represent nothing other than themselves (Morse, 1994a).

- ❑ Your sample selection must be directly related to the type of study you intend to conduct, the research question you are asking, and the type of evidence you need to present in order to respond to that question

- ☐ For example, would you take a random sample of 13–16-year-old teenagers from a particular region if you wanted to investigate their use of the internet?
- ☐ What if, when your random sample was decided, none had ever touched a computer?

- ☐ Think carefully about the research question you are asking and the nature of the response you want: do you want to be in a position to make general statements or do you want to provide detailed insight?
- ☐ Your answer will often determine the research method(s) and sampling techniques that are appropriate to accomplish this.



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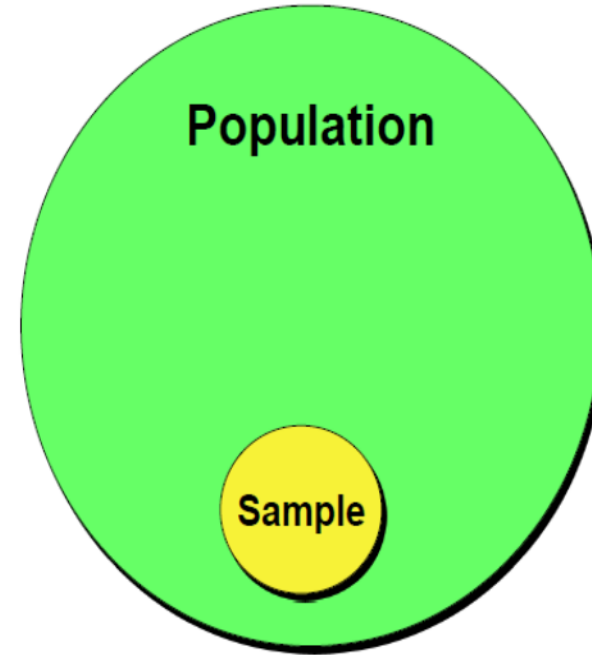
Population and sample

- So how do we go about selecting a sample and what do we select the sample from?

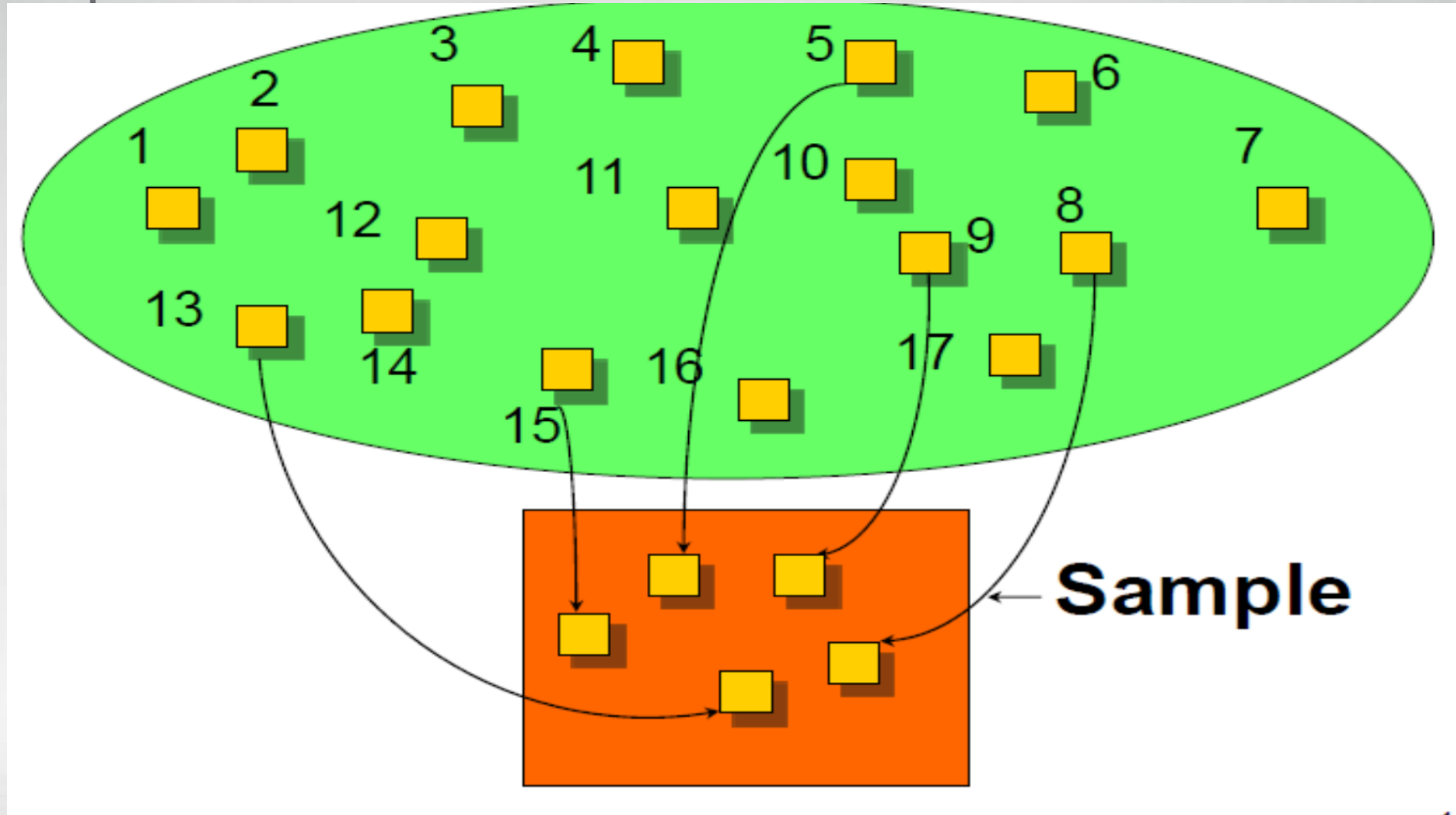
- Your research population is the entire set of individuals about which inference will be made

Population – A group that includes all the cases (individuals, objects, or groups) in which the researcher is interested.

□ **Sample** – A relatively small subset from a population

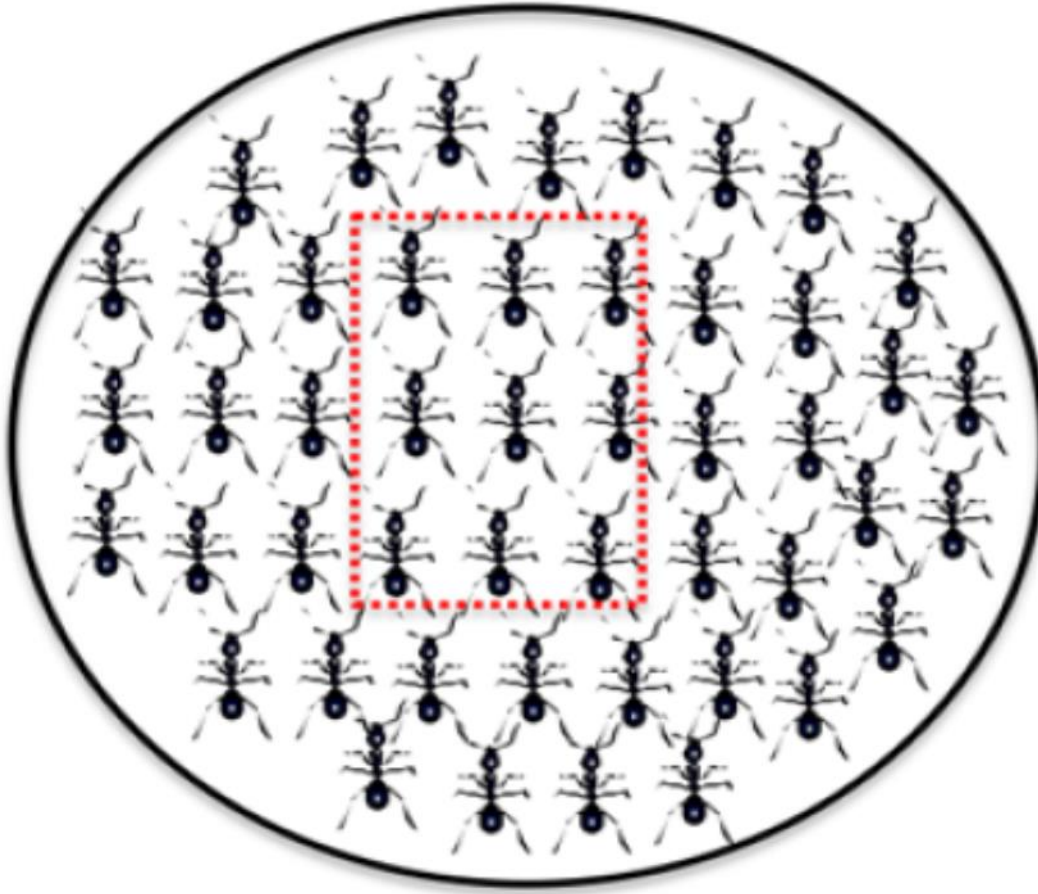


Population and sample

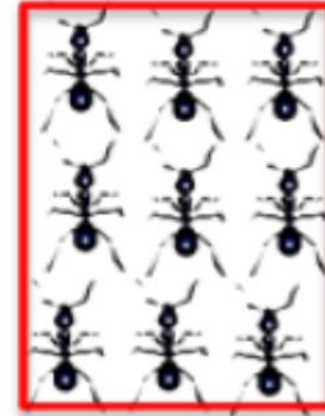


Population and sample

Population (N)



Sample (n)



- **An element** is a single member of the population.
- **A subject** is a single member of the sample, just as an element is a single member of the population.

Who is the target group for the study?	This is called the study population
Who in the target group should be surveyed?	This is called the sample .
How many people should be surveyed?	This is called the sample size .
How should the people to be surveyed be selected?	This is called the sampling method .

- For example, before a political election opinion polls are used to gauge the general trends that are emerging within the population;

- these opinion polls are drawn from a small section of the entire population in order to make inferences concerning the likely outcome of the election, when every member of the population should cast their own vote.

- So, the expressed opinion of a small number of the population is used to infer political preferences within the entire population

- This example should also indicate that inferences could sometimes be wrong! Be wary of making exaggerated claims or extended generalizations based on relatively small samples.

- But that does not mean your discovery has no significance;
- you just need to be honest with your reader when you put forward your inferences, make them aware of the sample and also make them aware that it is impossible to account for all individual traits.

- This is a discovery based on a 'best possible estimation'.



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Sampling Techniques

Sampling Techniques

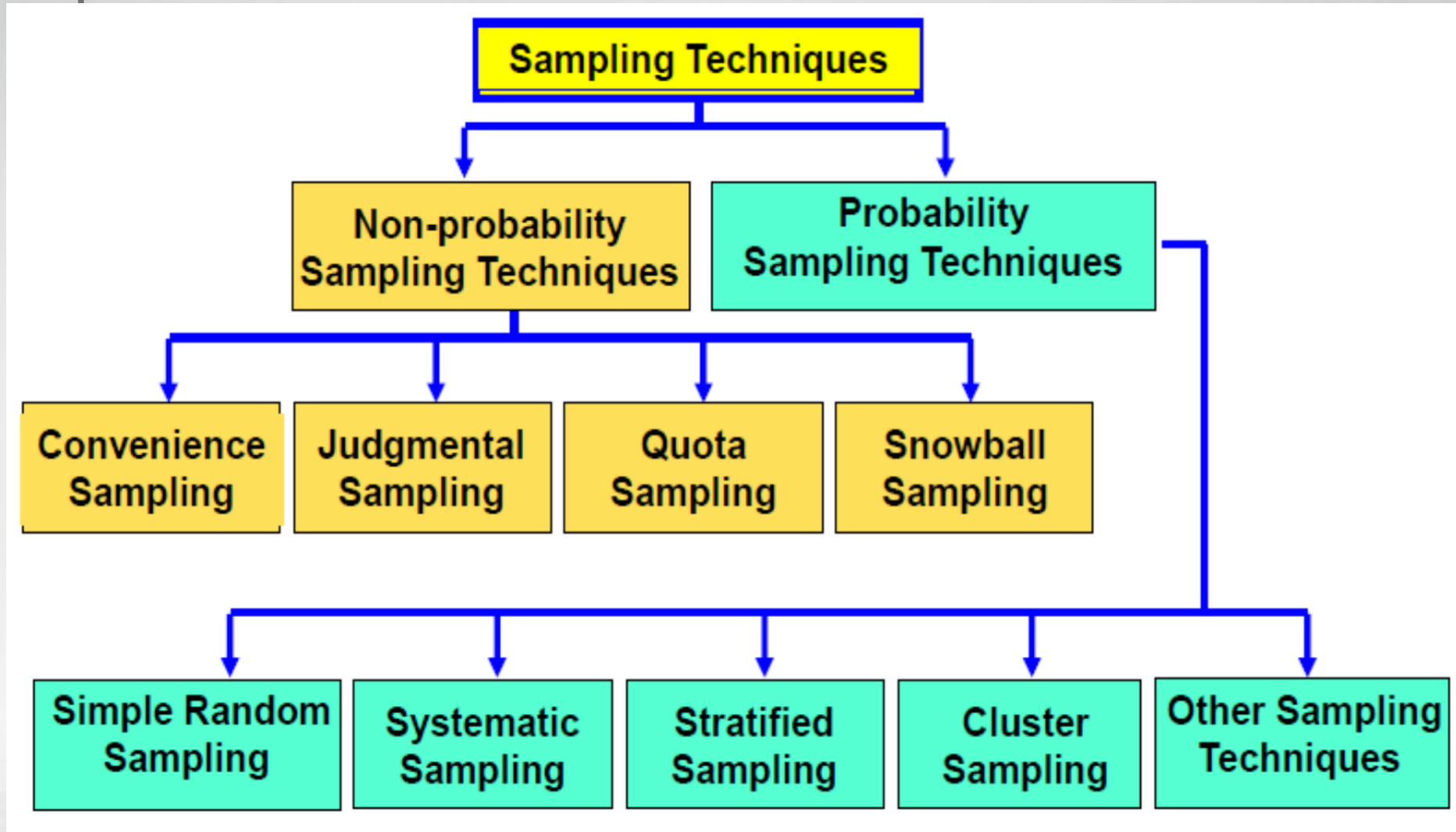
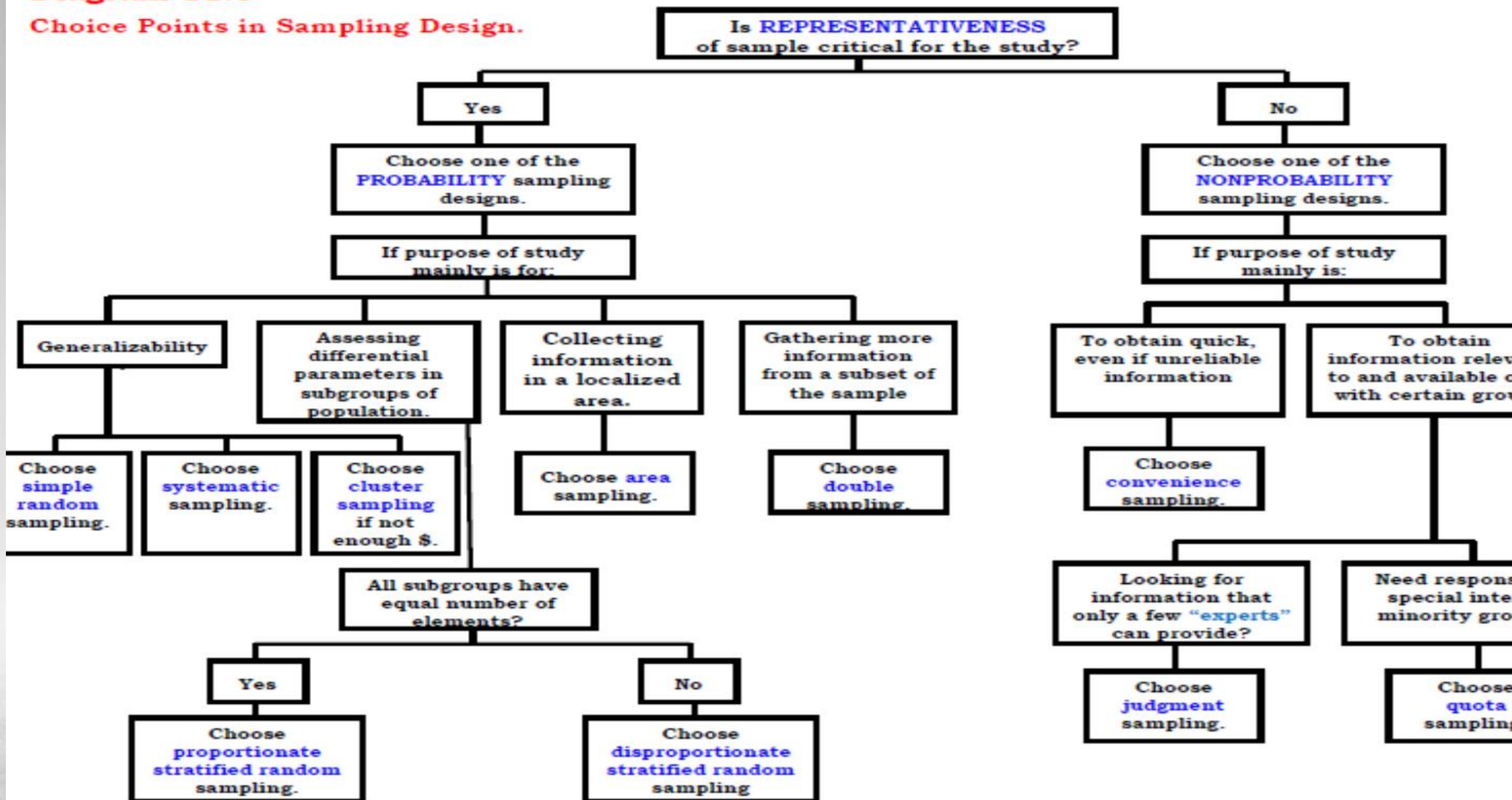


Diagram 11.3

Choice Points in Sampling Design.





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Sampling Techniques- Probability sampling

- In order to provide a statistical basis for generalizing from a research study to a wider population, probability sampling must be applied.
- There are a number of techniques available that allow for statistical generalization but remember that the logic of statistical generalization demands that certain conditions are met.

▪ These conditions are that the:

- Sample is representative of a wider population
- Wider population is properly defined يتم تحديد عدد أكبر من السكان بشكل صحيح
- Sample was drawn from a population using probability sampling methods.

- Even where a sample is obtained using probability sampling methods, the ability of such sampling to produce a representative sample will depend on:
 - ✓ The adequacy of the sampling frame from which the sample was drawn;
 - ✓ Any bias in response and non-response from the selected sample units (De Vaus, 2002a, 149).

- It is always preferable to calculate the sampling error present in your research, as this provides your reader with a more realistic understanding of the significance of your findings.
- 'Error' in this case does not mean a 'mistake', it is the term used to demonstrate the likely variance between results obtained from the sample and characteristics of the population as a whole.
- A general rule is that the larger the sample size the smaller the sampling error.

- For the purposes of the examples in this section let us assume that:
- ❖ Our research population is the entire membership of a professional association.

- **Random sampling** is a procedure of creating a sample where each member of the defined population has an equal chance of being selected for inclusion and the selection of one participant depends on the selection of any other from that population.
- A simple random sample can be drawn in several ways.

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- **A simple random sample can be drawn in several ways.**

1- We could write the name of every member of the professional association on a separate slip of paper; all of the names could then be placed in a large container.

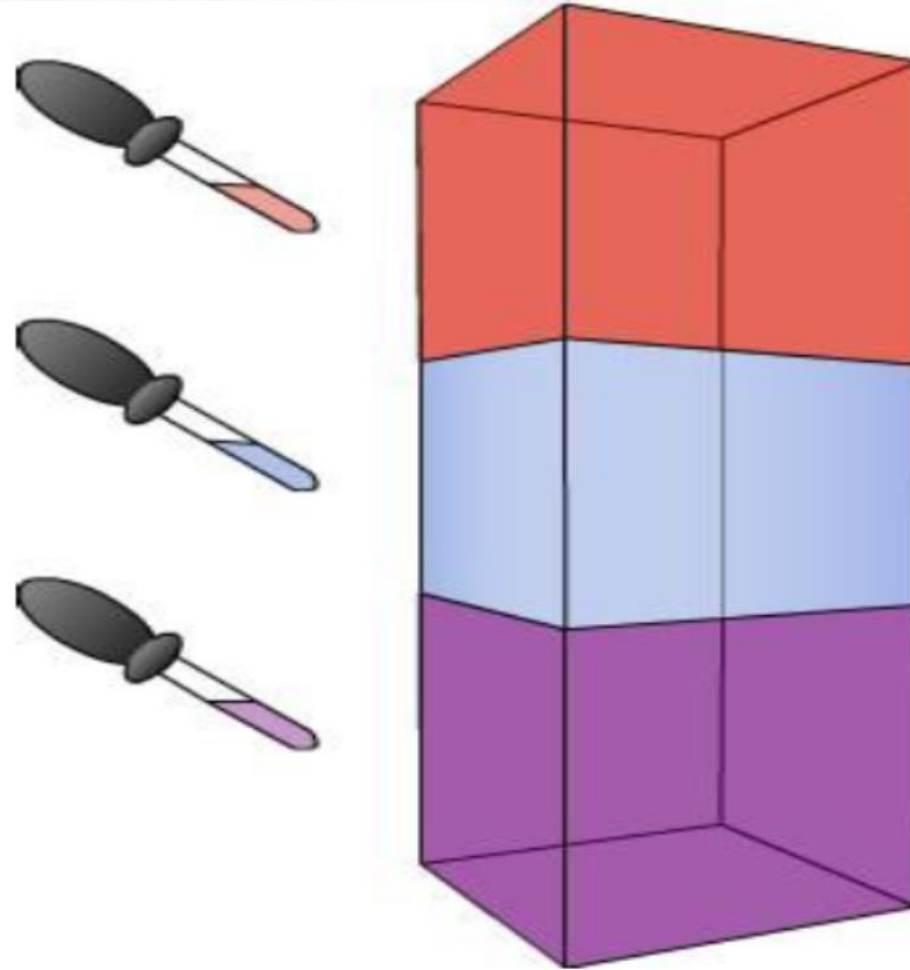
- We then draw out random slips of paper until we have the number required for our sample

2- An alternative is to use a random number table, a table of numbers where the numbers are listed in no particular order and no number occurs any more frequently than any other.

- Using our example and assuming the association had a membership of 3000, we would give each association member a number from 1 to 3000 on a separate population list.

- This process can be performed using a computer program that numbers each member of the population, generates a list of random numbers and then produces a sample list based on those numbers.

Stratified Sampling



- Very often a research population will have recognized groups or strata within that population.
- There are two ways of dealing with this if you wish to include the distinct groups as an element of the sample design: stratified random sampling or cluster sampling.
- Stratified random sampling allows for random selection within each group or strata.

- **This is a two-stage process:**
 - ❖ First the groups are identified and the research population is listed within their groups.
 - ❖ Once this list has been prepared a random sample is taken from the group in the same way as a simple random sample would be drawn from the entire research population.

- It is important here to remember that each group should be represented in the sample in **equal proportion** to the size of that group in relation to the entire research population.
- Using our example of association membership, one possible choice of grouping or strata could be 'duration of membership'; members would be listed according to the length of time they had been members (see Table 5.1).

Table 5.1 Sample composition using stratified random sampling

Length of membership	No. in research population	No. in final sample
6-10 yrs	450	45
11-15 yrs	670	67
16-20 yrs	590	59
21-25 yrs	420	42
26-30 yrs	350	35
31-35 yrs	270	27
36-40 yrs	120	12
41-45 yrs	90	9
46-50 yrs	40	4
Total	3000	300

STRATIFIED RANDOM SAMPLING

JOB LEVEL	# OF ELEMENTS	# OF SUBJECTS	
		PROPORTIONATE (20%)	DISPROPORTIONATE
Top Management	10	2	7
Middle Mgt.	30	6	15
Lower Mgt.	50	10	20
Supervisors	100	20	30
Clerks	500	100	60
Secretaries	20	4	10
Total	710	142	142

Example

Age	Number of people
5 - 15	132
16 - 25	678
26 - 40	543
41 - 60	289
61+	108

Population= 1750

$n = 313$

Calculate number of people within each strata?

Example

Age	Number of people
5 - 15	132
16 - 25	678
26 - 40	543
41 - 60	289
61+	108

24

121

97

52

19

Population= 1750
n= 313

The proportion= $\frac{313}{1750} = 17.8\% = 0.178$



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Sampling Techniques- Purposive sampling

- ❑ 'The logic of purposeful sampling lies in selecting information-rich cases for study in depth.
- ❑ Information-rich cases are those from which one can learn a great deal about issues of central importance to the purpose of the research' (Patton, 2002, 169).

- ❑ There are two possible approaches to purposive sampling:
 - ❖ A priori sampling: which establishes a sample framework before sampling begins;
 - ❖ And Snowball sampling: which takes an inductive approach to 'growing' the sample as the research progresses.

- ❑ To walk out into the field not having an a priori sample map, not knowing who you need to include in your investigation, can be a very nerve-wracking experience, even for the more experienced researcher.
- ❑ It can also be very difficult if you are restricted by time; many academic research studies have to be undertaken in a relatively short time frame.

- ❑ If this is your first attempt at qualitative research, or if you are very restricted by time, you may want to create some boundaries to your sample by applying a more rigid structure. **A priori sampling would** provide you with that structure.

- ❑ Let us return to our example of the professional association; we have investigated the literature on the issue and have discovered that the significant criteria that appear to influence a professional's attitude towards their association are **gender, type of membership and location.**

- ❑ Using this information we construct a sample grid for our investigation (see Table 5.2). We know we have to identify members who fit these cells and attempt to fill each cell as evenly as possible to build our sample.
- ❑ Once the overall structure has been determined we can identify individuals in an inductive manner more appropriate to qualitative research until the cells are evenly populated.

Table 5.2 Sample grid

	Associate		Affiliated		Fellow	
	Male	Female	Male	Female	Male	Female
NE						
NW						
Mid						
SE						
SW						

- ❑ Snowball and theoretical sampling are processes that allow for 'on-going joint collection and analysis of data associated with the generation of theory' (Glaser and Strauss, 1967, 48).

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Summary

- Sampling is a vital stage in the research process; the outcomes, rigour and trustworthiness of your research all rely on the robustness of the sample and how that sample was identified.
- The sampling technique you apply must be appropriate to your research goals and conform to the research tradition you have chosen for your investigation.

- What is important is that you choose a technique that matches your research design, you are open and honest about your sample composition and you provide your reader with sufficient detail to understand the significance of your findings and any bias that may exist as a result of your sampling:

- For most research, investigators often have to make do with whatever subjects they can gain access to. Generalisations from such samples are not valid and the results only relate to the subjects from whom they are derived' (Burns, 2000, 85). In qualitative research this is exactly as it should be.

- Generalization, in this sense, is not a goal of qualitative research but it often is in quantitative research.
- Whichever tradition you are following be very careful about claims you make based on the sample you have studied.



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Thank You

