

Final Project-2

Lecture 3

Research Methodology- P2



Session Outline

- Population, Sample & Sampling Methods
- Data sources and types
- Data analysis procedures

Population, Sample & Sampling Methods

مجتمع الدراسة, عينة الدراسة & طرق أخذ
العينات

1





Population and sample

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

■ إذن كيف يمكننا اختيار العينة ومن ماذا نختار العينة؟

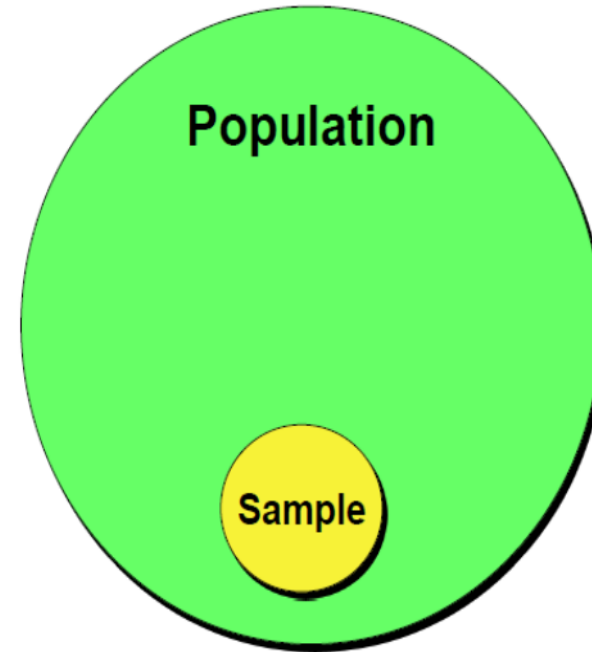
- Your research population is the entire set of individuals about which inference will be made
- مجتمع البحث الخاص بك هو المجموعة الكاملة من الأفراد الذين سيتم الاستدلال عليهم

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

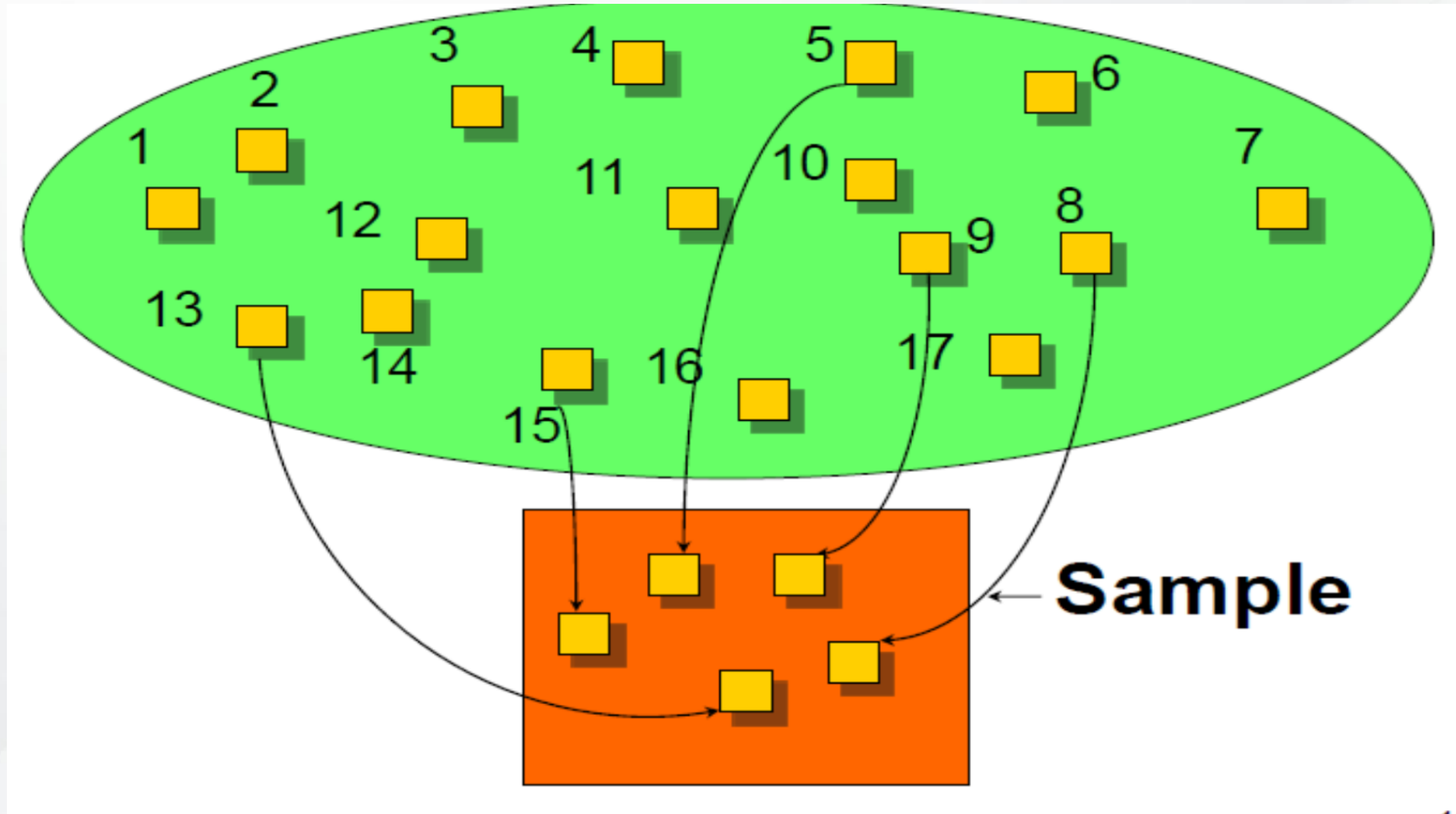
المجتمع – مجموعة تضم جميع الحالات (أفراد، كائنات، أو مجموعات) التي يهتم بها الباحث.

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

□ العينة - مجموعة فرعية صغيرة نسبياً من المجتمع

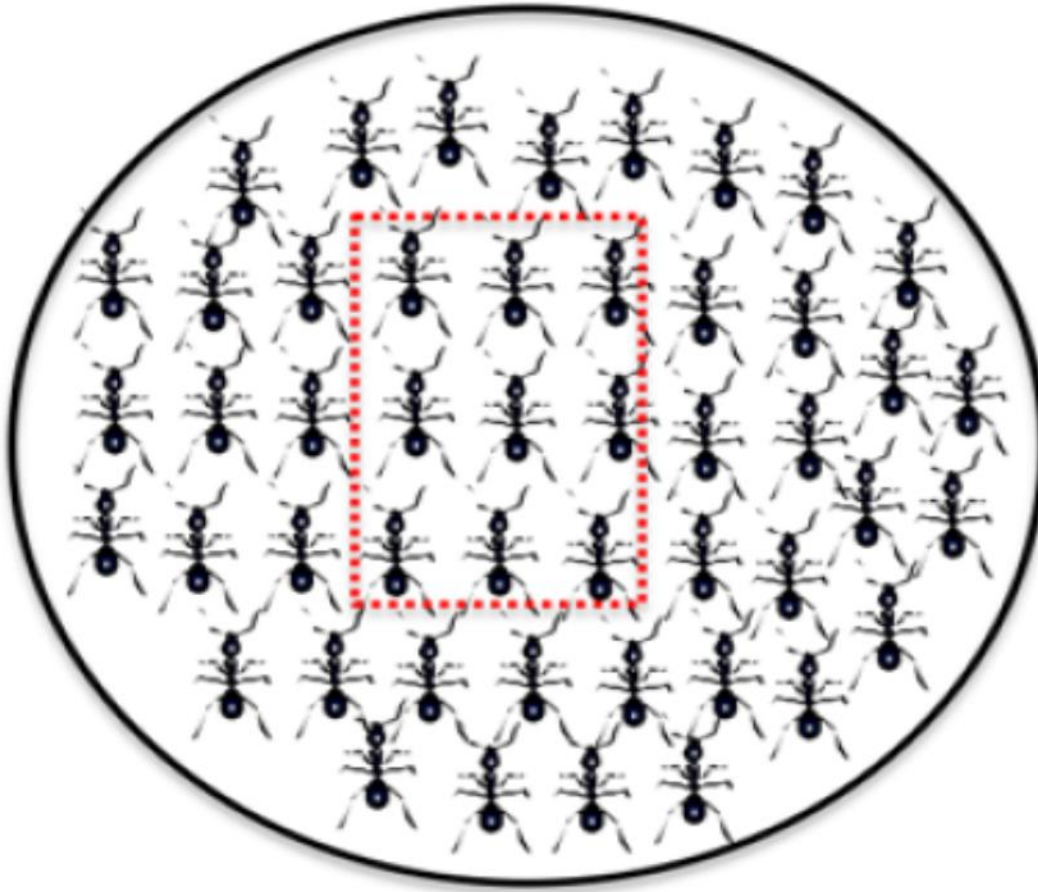


Population and sample

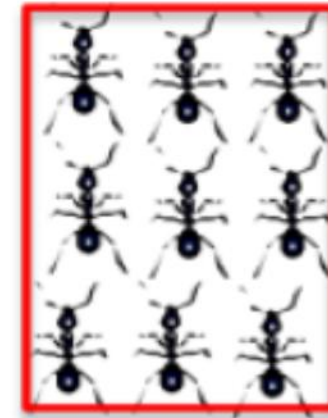


Population and sample

Population (N)



Sample (n)



- **An element** is a single member of the population.
العنصر هو فرد واحد من المجتمع.
- **A subject** is a single member of the sample, just as an element is a single member of the population.
فالفرد هو عضو واحد في العينة، كما أن العنصر هو عضو واحد في المجتمع.

Population and sample- Relevant Terms

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;

■ على سبيل المثال، قبل الانتخابات السياسية، يتم استخدام استطلاعات الرأي لقياس الاتجاهات العامة التي تظهر بين السكان؛

- 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.

■ يتم استخلاص استطلاعات الرأي هذه من قسم صغير من إجمالي السكان من أجل التوصل إلى استنتاجات بشأن النتيجة المحتملة للانتخابات، عندما يدلي كل فرد من السكان بصوته الخاص.

- So, the expressed opinion of a small number of the population is used to infer political preferences within the entire population
- لذلك، يتم استخدام الرأي المعبر عنه لعدد صغير من السكان لاستنتاج التفضيلات السياسية لدى جميع السكان

- 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.
- يجب أن يشير هذا المثال أيضًا إلى أن الاستدلالات قد تكون خاطئة في بعض الأحيان! كن حذرًا من تقديم ادعاءات مبالغ فيها أو تعميمات موسعة بناءً على عينات صغيرة نسبيًا.



What is Sampling?

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

❑ أخذ العينات هو عملية اختيار عدد قليل من الكثير من أجل إجراء البحوث التجريبية.

Why sampling?

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

❑ يتم استخدام أخذ العينات عندما لا يكون من الممكن أو العملي تضمين مجتمع البحث بالكامل في دراستك، وهو ما يحدث عادةً

Why sampling?

- ❑ The method of sampling used plays a major role in any research investigation.
- ❑ تلعب طريقة أخذ العينات المستخدمة دورًا رئيسيًا في أي تحقيق بحثي.

Why sampling?

❑ 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.

❑ يجب عليك توخي الحذر عند اختيار تقنية أخذ العينات؛ هناك عدد من الأساليب المختلفة لأخذ العينات وينبغي أن يتأثر اختيار النهج إلى حد كبير بالغرض من التحقيق.

Why sampling?

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

❑ من غير المناسب تمامًا الانخراط في دراسة نوعية محلية صغيرة الحجم ثم محاولة التعميم من النتائج.

Why sampling?

- ❑ 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.

❑ هناك قاعدة تبسيطية إلى حد ما وهي افتراض أن البحث الكمي سوف يميل إلى استخدام تقنيات أخذ العينات الاحتمالية وأن البحث النوعي سوف يميل إلى استخدام أخذ العينات الهادفة.

Why 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.

❑ تذكر أننا عندما نتحدث هنا عن البحث النوعي فإننا نتحدث عن صور غنية متعمقة، وليس تفاصيل قصيرة تم جمعها من الكثيرين من أجل إضافة تفاصيل إلى الأدلة القابلة للقياس التي تم جمعها.

Why sampling?

□ 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'.

□ يذكر باين (1990، 23) أن الباحثين الوضعيين والتفسيريين "قد يكون لديهم جذور أيديولوجية مختلفة تمامًا ولكن هناك اهتمام مشترك بضمان تمثيل المشاركين".

Why sampling?

❑ 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

❑ يجب أن يكون اختيار العينة مرتبطًا بشكل مباشر بنوع الدراسة التي تنوي إجرائها، وسؤال البحث الذي تطرحه، ونوع الأدلة التي تحتاج إلى تقديمها للرد على هذا السؤال

Why sampling?

- ☐ 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?
- ☐ على سبيل المثال، هل يمكنك أخذ عينة عشوائية من المراهقين الذين تتراوح أعمارهم بين 13 و16 عامًا من منطقة معينة إذا أردت التحقق من استخدامهم للإنترنت؟
- ☐ ماذا لو، عندما تم تحديد عينتك العشوائية، لم يلمس أي منها جهاز كمبيوتر على الإطلاق؟

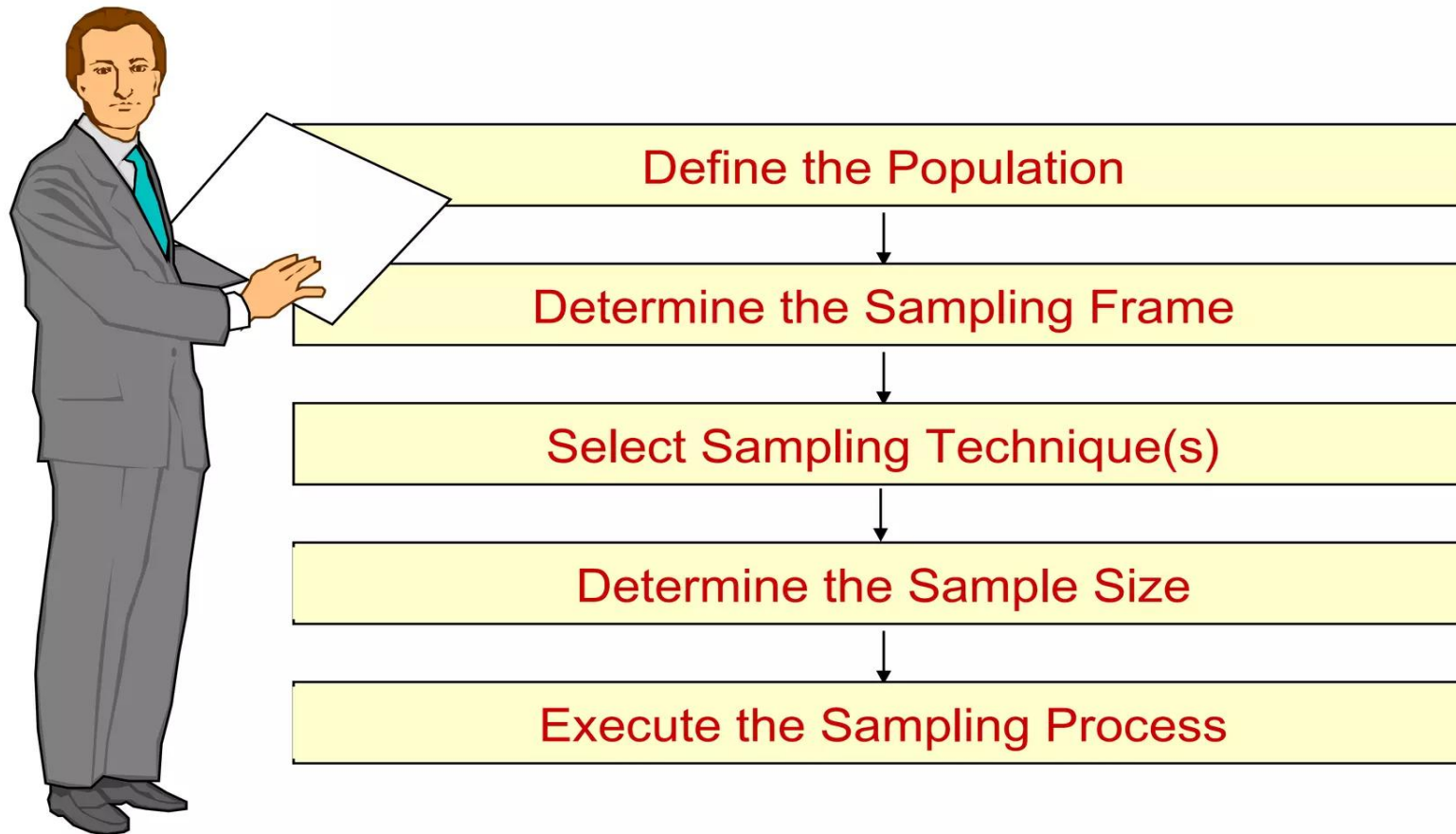
Why sampling?

- ❑ 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.
- ❑ فكر جيدًا في سؤال البحث الذي تطرحه وطبيعة الرد الذي تريده: هل تريد أن تكون في وضع يسمح لك بالإدلاء ببيانات عامة أم تريد تقديم رؤية تفصيلية؟
- ❑ ستحدد إجابتك غالبًا طريقة (طرق) البحث وتقنيات أخذ العينات المناسبة لتحقيق ذلك.



Sampling Techniques

The Sampling Design Process



Sampling Techniques

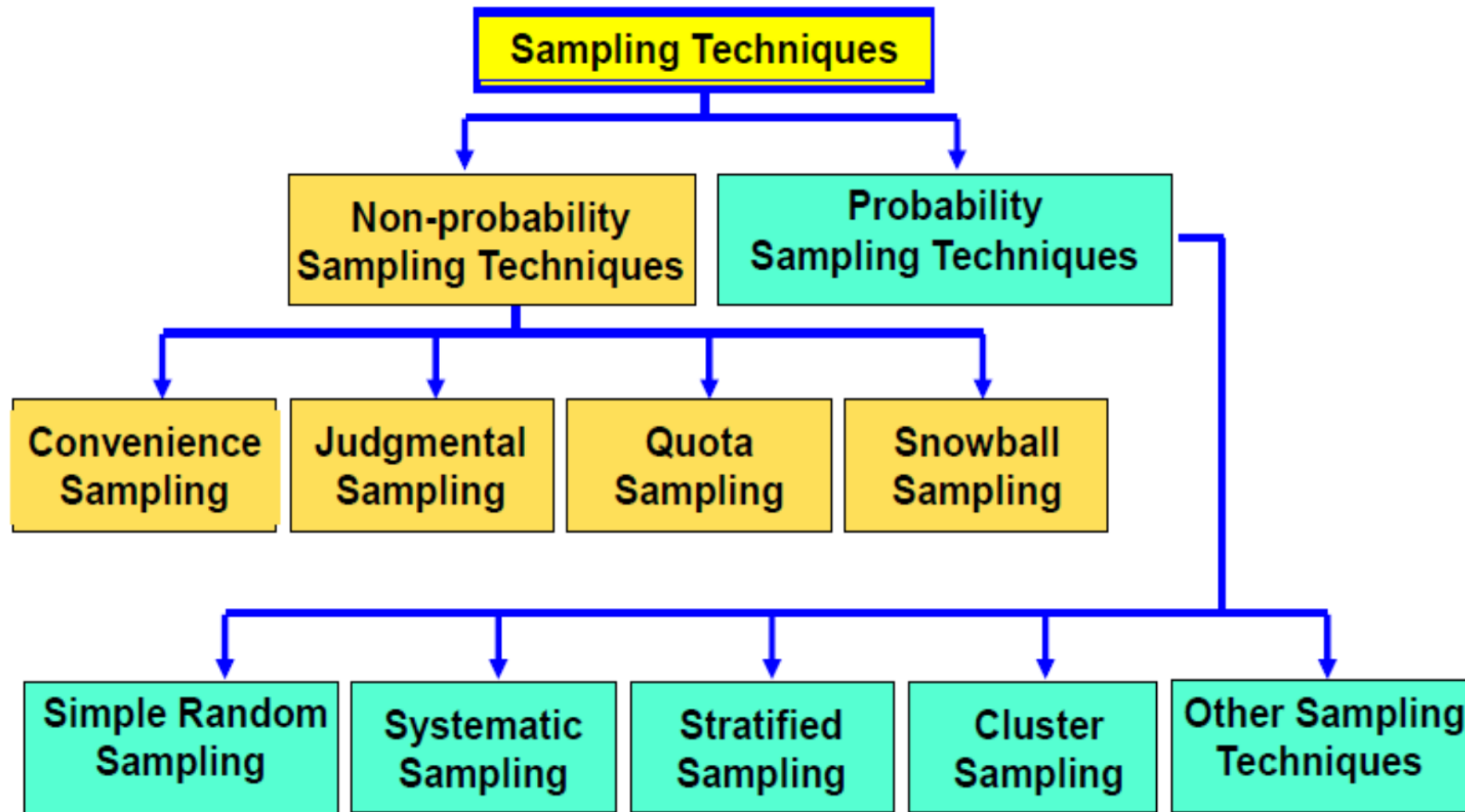


Diagram 11.3

Choice Points in Sampling Design.

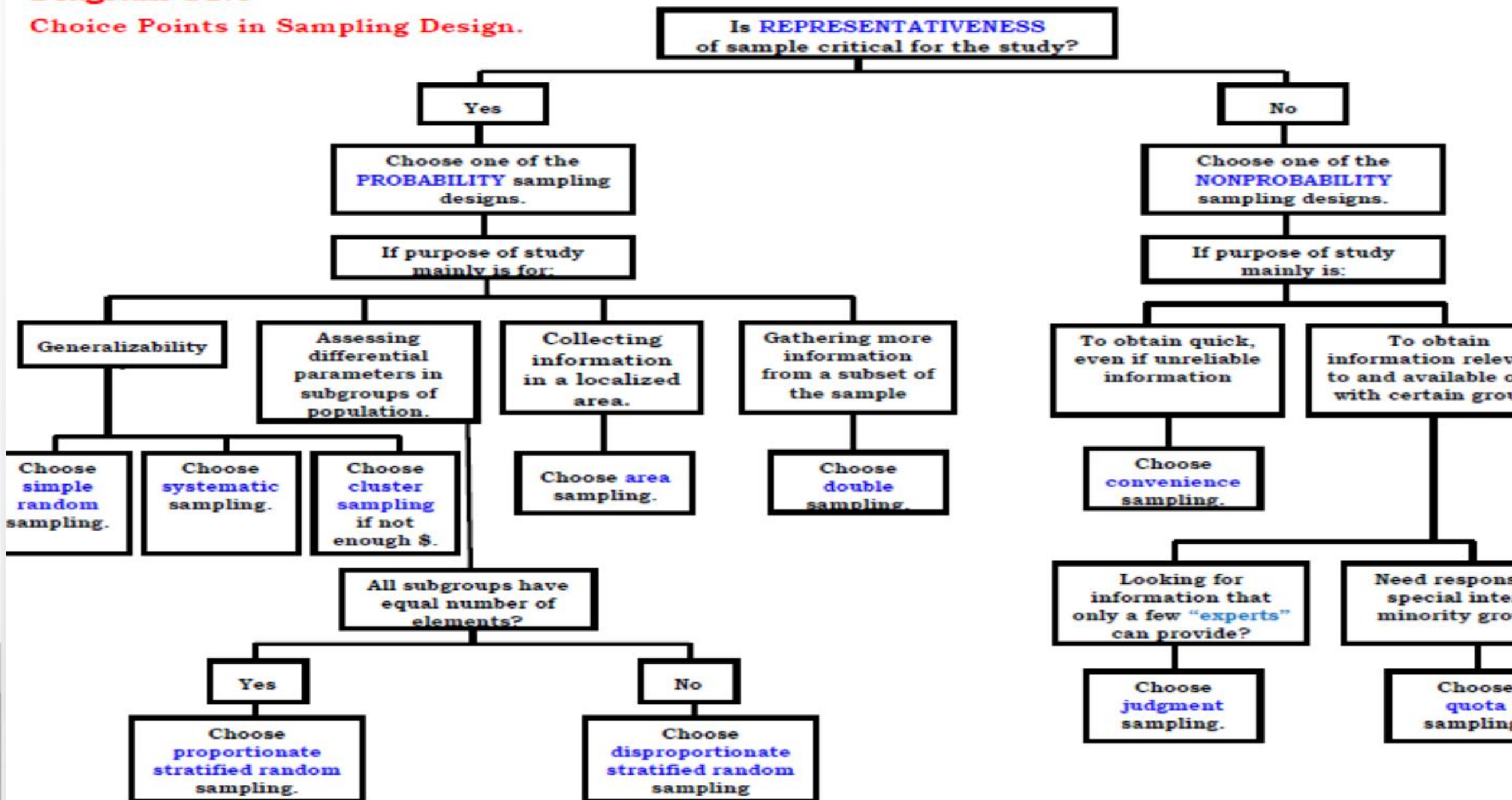


Table for Determining Sample Size from a Given Population

<i>N</i>	<i>S</i>	<i>N</i>	<i>S</i>	<i>N</i>	<i>S</i>
10	10	220	140	1200	291
15	14	230	144	1300	297
20	19	240	148	1400	302
25	24	250	152	1500	306
30	28	260	155	1600	310
35	32	270	159	1700	313
40	36	280	162	1800	317
45	40	290	165	1900	320
50	44	300	169	2000	322
55	48	320	175	2200	327
60	52	340	181	2400	331
65	56	360	186	2600	335
70	59	380	191	2800	338
75	63	400	196	3000	341
80	66	420	201	3500	346
85	70	440	205	4000	351
90	73	460	210	4500	354
95	76	480	214	5000	357
100	80	500	217	6000	361
110	86	550	226	7000	364
120	92	600	234	8000	367
130	97	650	242	9000	368
140	103	700	248	10000	370
150	108	750	254	15000	375
160	113	800	260	20000	377
170	118	850	265	30000	379
180	123	900	269	40000	380
190	127	950	274	50000	381
200	132	1000	278	75000	382
210	136	1100	285	1000000	384

Note.—*N* is population size.
S is sample size.

krejcie, r.v., & morgan, d.w.,
 (1970). determining sample size
 for research activities.
 educational and psychological
 measurement.



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.
- من أجل توفير أساس إحصائي للتعميم من دراسة بحثية على عدد أكبر من المجتمع، يجب تطبيق أخذ العينات الاحتمالية.
- هناك عدد من التقنيات المتاحة التي تسمح بالتعميم الإحصائي ولكن تذكر أن منطق التعميم الإحصائي يتطلب استيفاء شروط معينة.

- Probability sampling refers to the selection of a sample from a population, when this selection is based on the principle of randomization, that is, random selection or chance.
- Probability sampling is more complex, more time-consuming and usually more costly than non-probability sampling.

- 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.
 - تم سحب العينة من مجتمع ما باستخدام طرق أخذ العينات الاحتمالية.

- Even where a sample is obtained using probability sampling methods, the ability of such sampling to produce a representative sample will depend on:
 - حتى في حالة الحصول على عينة باستخدام طرق أخذ العينات الاحتمالية، فإن قدرة هذا النوع من العينات على إنتاج عينة تمثيلية ستعتمد على ما يلي:
- ✓ 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).
 - ✓ مدى كفاية إطار المعاينة الذي تم سحب العينة منه؛
 - ✓ أي تحيز في الاستجابة وعدم الاستجابة من وحدات العينة المختارة (De Vaus, 2002a, 149).

- A general rule is that the larger the sample size the smaller the sampling error.
- القاعدة العامة هي أنه كلما زاد حجم العينة كلما قل خطأ العينة.

- **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.
- أخذ العينات العشوائية هو إجراء لإنشاء عينة حيث يكون لكل فرد من أفراد المجتمع المحدد فرصة متساوية في الاختيار لإدراجه، واختيار مشارك واحد يعتمد على اختيار أي شخص آخر من هذا السكان.
- ويمكن سحب العينة العشوائية البسيطة بعدة طرق.

Simple Random Sampling

- Each element in the population has a known and equal probability of selection.
- Each possible sample of a given size (n) has a known and equal probability of being the sample actually selected.
- This implies that every element is selected independently of every other element. This method is equivalent to a lottery system.

Step 1: Make a list

Step 2: Assign a sequential number (Sampling Frame)

Step 3 : Figure out what your sample size is going to be

Step4: Use any method of selection from following

(Random Number Tables, Lottery table,
Throwing dies, Tossing of Coins)

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

- يمكننا كتابة اسم كل عضو في الرابطة المهنية على قصاصة منفصلة من الورق؛ يمكن بعد ذلك وضع جميع الأسماء في حاوية كبيرة.

- نقوم بعد ذلك بسحب قصاصات عشوائية من الورق حتى نحصل على العدد المطلوب لعينتنا

Probability sampling- Systematic random sampling

Systematic Sampling can be defined as a method of probability sampling in which a researcher chooses a random starting point and a sample interval with which the sample group is selected from the target population.

This is the most basic type of systematic sampling and these are the steps taken to conduct it:

- Calculate sampling interval using the formula $i = N/n$
- Pick a starting point “r”. This point must be between 1 and the number of the sampling interval (between 1 and i).
- **For instance**, in the example shown above, the sampling interval is 40 so we must pick a number between 1 and 40.
- Using the sampling interval, choose successive elements until the desired sample size is reached.

Systematic Random Sampling

1	21
2	22
3	23
4	24
5	25
6	26
7	27
8	28
9	29
10	30
11	31
12	32
13	33
14	34
15	35
16	36
17	37
18	38
19	39
20	40

$$n \rightarrow K = N/n$$

Size of Population $\rightarrow N = 40$

Size of sample $\rightarrow n = 8$

$$\begin{aligned} K &= N/n \\ &= 40/8 \\ &= 5 \end{aligned}$$

Items selected

5, 10, 15, 20, 25, 30, 35, 40

Probability sampling- Systematic random sampling

$N = 100$

want $n = 20$

$N/n = 5$

**select a random number from 1-5:
chose 4**

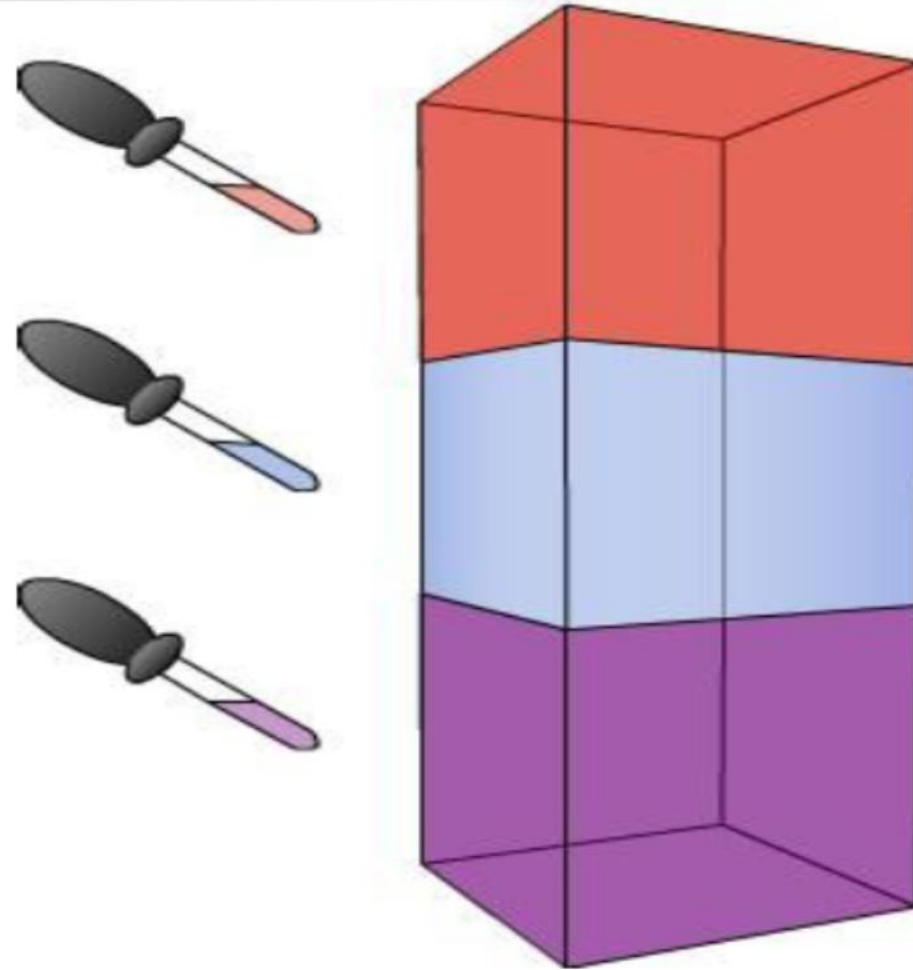
start with #4 and take every 5th unit

1	26	51	76
2	27	52	77
3	28	53	78
4	29	54	79
5	30	55	80
6	31	56	81
7	32	57	82
8	33	58	83
9	34	59	84
10	35	60	85
11	36	61	86
12	37	62	87
13	38	63	88
14	39	64	89
15	40	65	90
16	41	66	91
17	42	67	92
18	43	68	93
19	44	69	94
20	45	70	95
21	46	71	96
22	47	72	97
23	48	73	98
24	49	74	99
25	50	75	100

- 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.
- يمكن إجراء هذه العملية باستخدام برنامج كمبيوتر يقوم بترقيم كل فرد من أفراد المجتمع، ويولد قائمة من الأرقام العشوائية ثم ينتج قائمة عينة بناءً على تلك الأرقام.

Probability sampling- Stratified random sampling

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).

Stratified Sampling Formula

$$\text{Stratified Random Sampling} = \frac{\text{Total Sample Size}}{\text{Entire Population}} \times \text{Population of Subgroups}$$



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

Probability sampling- Stratified random sampling

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

Probability sampling- Stratified random sampling

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?

Probability sampling- Stratified random sampling

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



Sampling Techniques- Non-probability sampling

- ❑ Non-random sampling is a sampling technique where the sample selection is based on factors other than just random chance.
- ❑ In other words, non-random sampling is biased in nature. Here, the sample will be selected based on the convenience, experience or judgment of the researcher.

Non- probability sampling (2)

Point to consider

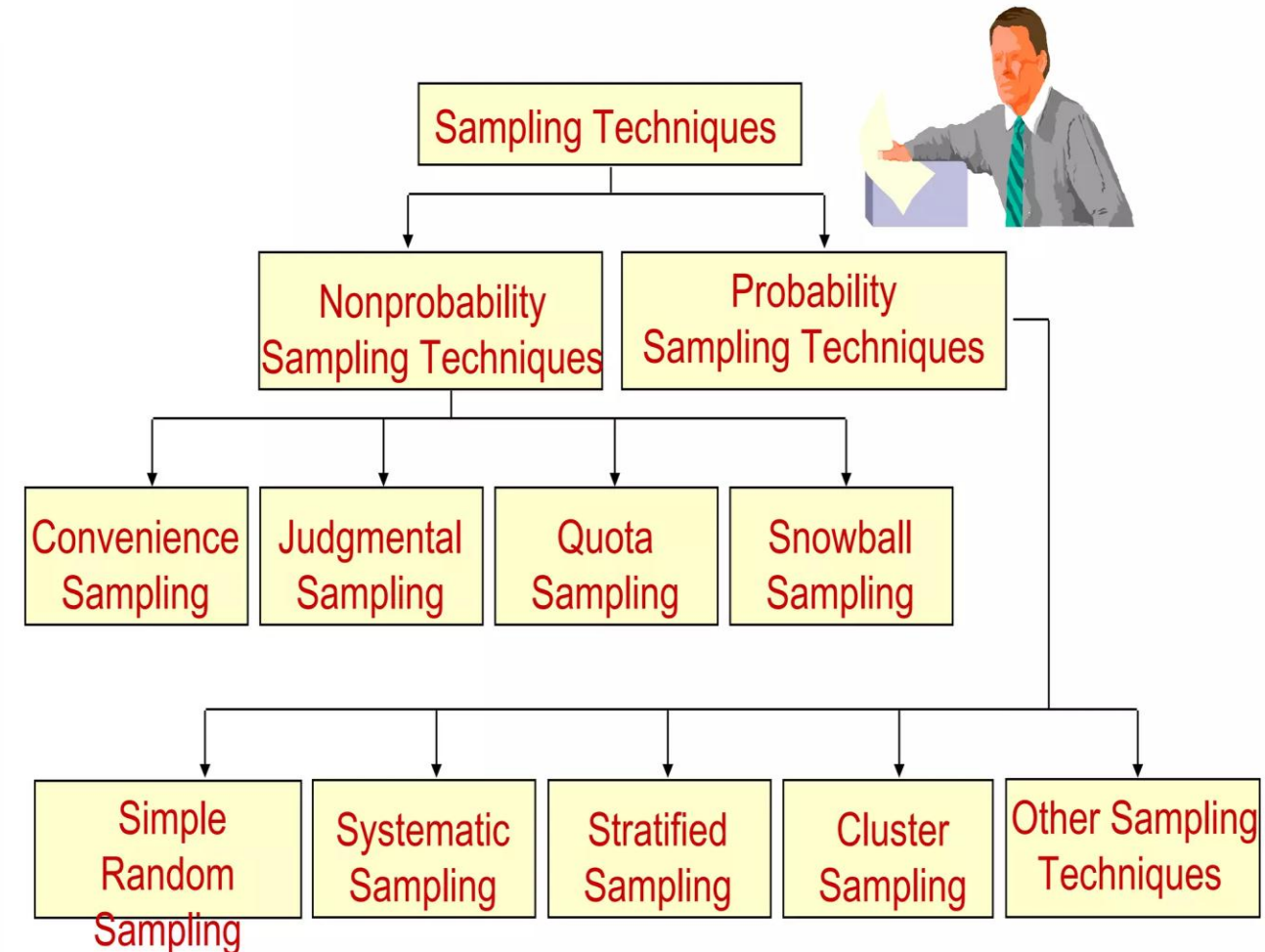
Deciding on a suitable sample size
Data saturation

Selecting the appropriate technique

Sampling techniques

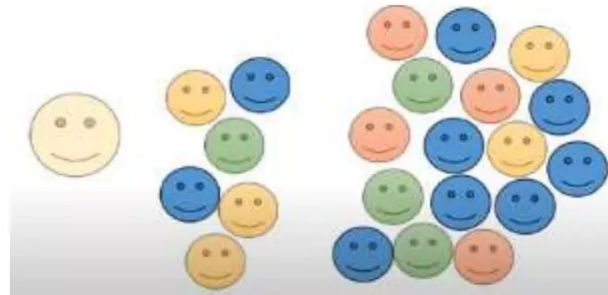
- Convenience sampling
- Quota sampling (larger populations)
- Purposive sampling
- Snowball sampling
- Self-selection sampling
- Convenience sampling

Classification of Sampling Techniques



1. Convenience sampling

- In Convenience sampling, the researcher select those units from the population which are accessible to the researcher



- Subjects are chosen simply because they are easy to recruit.
- This technique is considered easiest, cheapest and least time consuming

A Graphical Illustration of Convenience Sampling

A	B	C	D	E
1	6	11	16	21
2	7	12	17	22
3	8	13	18	23
4	9	14	19	24
5	10	15	20	25

Group D happens to assemble at a convenient time and place. So all the elements in this Group are selected. The resulting sample consists of elements 16, 17, 18, 19 and 20. Note, no elements are selected from group A, B, C and E.

Judgmental Sampling

Judgmental sampling is a form of convenience sampling in which the population elements are selected based on the judgment of the researcher.

- test markets
- purchase engineers selected in industrial marketing research
- precincts selected in voting behavior research
- expert witnesses used in court

Graphical Illustration of Judgmental Sampling

A	B	C	D	E
1	6	11	16	21
2	7	12	17	22
3	8	13	18	23
4	9	14	19	24
5	10	15	20	25

The researcher considers groups B, C and E to be typical and convenient. Within each of these groups one or two elements are selected based on typicality and convenience. The resulting sample consists of elements 8, 10, 11, 13, and 24. Note, no elements are selected from groups A and D.

Quota Sampling

- In quota sampling the researcher ensures equal or proportionate representation of subjects depending on which trait is considered as basis of the quota
- The bases of the quota are usually age, gender, education, race, religion and socioeconomic status
- For example, if basis of the quota is socioeconomic status and the researcher needs equal representation of each quota (Sample size 150)
- (Upper class-Elite 30, Upper Middle Class 30 Lower Middle class 30, Working Class 30 Poor 30)
- Divide the population into specific groups.
- Calculate quota for each group based on relevant and available data
- Collect data from each quota

Quota Sampling

Quota sampling may be viewed as two-stage restricted judgmental sampling.

- The first stage consists of developing control categories, or quotas, of population elements.
- In the second stage, sample elements are selected based on convenience or judgment.

Control Characteristic Sex	<u>Population composition</u>	<u>Sample composition</u>	
	Percentage	Percentage	Number
Male	48	48	480
Female	52	52	520
	100	100	1000

3. Judgment or (Purposive sampling

- Subjects are chosen to be part of the sample with a specific purpose in mind.
- With judgmental sampling, the researcher believes that some subjects are more fit for the research compared other individuals.
- This is the reason why they are purposively chosen as subjects.
-
- Extreme case/deviant sampling: unusual or special case enable to learn the most about the RQ.
- Heterogeneous or maximum variation sampling: representing different subgroups
- Homogeneous sampling: One subgroup.
-

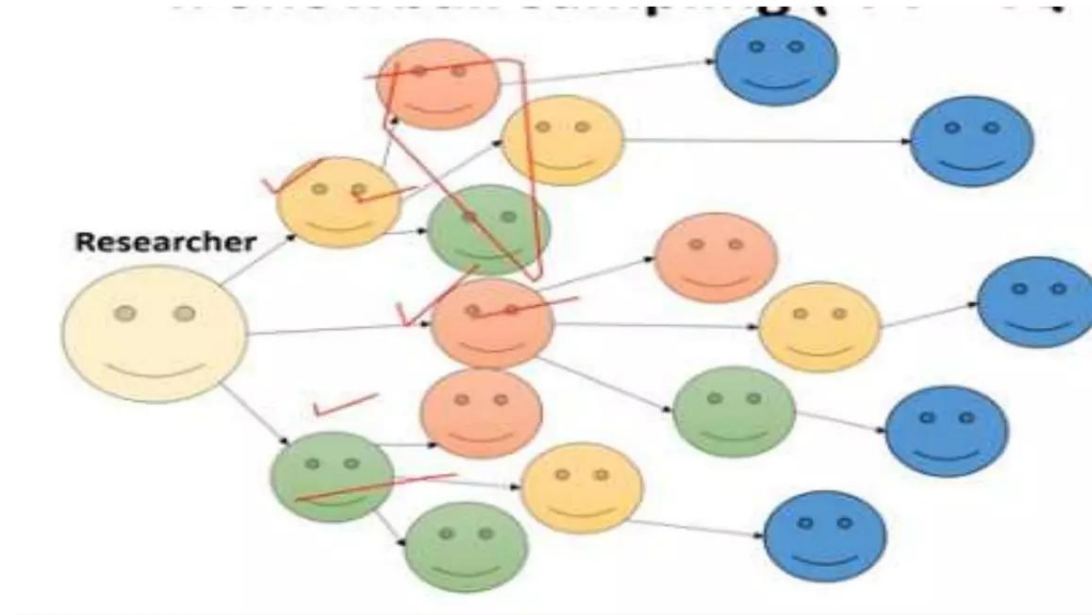
Snowball Sampling

In **snowball sampling**, an initial group of respondents is selected, usually at random.

- After being interviewed, these respondents are asked to identify others who belong to the target population of interest.
- Subsequent respondents are selected based on the referrals.



4. Snowball sampling



- Make contact with one or two cases in the population.
- Ask these cases to identify further cases.
- Ask these new case to identify further new cases.
- Stop when either no new cases are given or the sample is large enough.





Summary

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. Generalizations 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.



Exercise

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

- هي عملية اختيار عدد قليل من العديد من أجل إجراء بحث تجريبي.
- أخذ العينات Sampling
- عينة Sample
- لا توجد إجابة صحيحة No right answer
- المنهجية Methodology

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The quantitative research will tend to use probability sampling techniques

سوف يميل البحث الكمي إلى استخدام تقنيات أخذ العينات الاحتمالية

True

Exercise

When we are talking about quantitative research we are talking about in-depth rich pictures, not short detail collected from many

عندما نتحدث عن البحث الكمي، فإننا نتحدث عن صور غنية متعمقة، وليست تفاصيل قصيرة تم جمعها من كثيرين

False

There is only one possible approach to purposive sampling
يوجد نهج واحد فقط ممكن لأخذ العينات هادفة

False

18. takes an inductive approach to 'growing' the sample as the research progresses

يأخذ نهجًا استقرائيًا "التنمية" العينة مع تقدم البحث

أخذ العينات كرة الثلج Snowball sampling

أخذ العينات الأولوية Priori sampling

أخذ العينات الطباقية Stratified sampling

عينة عشوائية بسيطة Simple random sampling

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Simple random sampling عينة عشوائية بسيطة

Data sources and types

مصادر البيانات وأنواعها

02



Data types

❑ Secondary data

- ❑ The information collected by others for a purpose other than the project at hand, but may be useful for the project....or Data collected and processed by one researcher and reanalyzed for a different purpose by another researcher

❑ بيانات ثانوية: المعلومات التي يجمعها الآخرون لغرض آخر غير المشروع المطروح، ولكنها قد تكون مفيدة للمشروع.... أو البيانات التي يتم جمعها ومعالجتها بواسطة باحث واحد وإعادة تحليلها لغرض مختلف بواسطة باحث آخر

Data types

❑ Primary data

❑ Original data collected for the purpose of the research problem

• Observation, questionnaire, interview and tape recording, experiment results

❑ البيانات الأولية: البيانات الأصلية التي تم جمعها لغرض مشكلة البحث. الملاحظة، الاستبيان، المقابلة والتسجيل، نتائج التجربة

Sources of Data

- ❑ **Internal sources:** accounting records, sales data, commercial reports and other miscellaneous records.
- ❑ **External sources:** academic journals, dissertations, thesis, newspapers, books etc

Data analysis procedures

إجراءات تحليل البيانات

03



- ❑ This section will deal with statistical procedures for collecting practical data.
- ❑ سيتناول هذا القسم الإجراءات الإحصائية لجمع البيانات العملية.

❑ After collecting data, it is essential to analyze the information gathered to draw meaningful conclusions. As, the Statistical Package for the Social Sciences (SPSS), specifically version 28, were used to analyze the collected data

❑ بعد جمع البيانات، من الضروري تحليل المعلومات التي تم جمعها لاستخلاص استنتاجات ذات معنى. حيث تم استخدام الحزمة الإحصائية للعلوم الاجتماعية (SPSS) وتحديداً الإصدار 28 لتحليل البيانات المجمعة.

The sample profile test was conducted, via descriptive analysis, to gain insights into the characteristics of the sample population. It helps researchers understand the demographics, preferences, and other relevant information about the individuals involved in the study.

□ تم إجراء اختبار توصيف العينة، من خلال التحليل الوصفي، للحصول على نظرة ثاقبة لخصائص مجتمع العينة. يساعد الباحثين على فهم التركيبة السكانية والتفضيلات والمعلومات الأخرى ذات الصلة بالأفراد المشاركين في الدراسة.

- ❑ Validity and reliability tests are crucial in ensuring that the data collected is accurate and consistent. Validity tests (Exploratory factor analysis) to determine if the research instruments measure what they are intended to measure, while reliability tests (Cronbach's Alpha test) assess the consistency of results over time.

❑ تعتبر اختبارات الصلاحية والموثوقية حاسمة في ضمان دقة البيانات المجمعة واتساقها. اختبارات الصدق (التحليل العاملي الاستكشافي) لتحديد ما إذا كانت أدوات البحث تقيس ما تهدف إلى قياسه، بينما تقوم اختبارات الثبات (اختبار كرونباخ ألفا) بتقييم ثبات النتائج مع مرور الوقت.

- ❑ Descriptive statistics for the research variables: that provide a summary of the main characteristics of the data collected. It includes measures such as mean, median, mode, standard deviation, and variance, which help in understanding the distribution and patterns within the dataset.

❑ الإحصائيات الوصفية لمتغيرات البحث: والتي تقدم ملخصًا للخصائص الرئيسية للبيانات التي تم جمعها. ويتضمن مقاييس مثل المتوسط والوسيط والانحراف المعياري والتباين، مما يساعد في فهم التوزيع والأنماط داخل مجموعة البيانات.

□ In order to test the research hypotheses, simple and multiple linear regression tests employed to test research hypotheses and examine the relationships between variables. These tests help researchers determine the extent to which one variable predicts another, providing valuable insights into the research questions at hand.

□ ومن أجل اختبار فرضيات البحث يتم استخدام اختبارات الانحدار الخطي البسيط والمتعدد لاختبار فرضيات البحث وفحص العلاقات بين المتغيرات. تساعد هذه الاختبارات الباحثين على تحديد مدى توقع متغير واحد لآخر، مما يوفر رؤية قيمة حول أسئلة البحث المطروحة.

- ❑ By utilizing these various statistical analyses within SPSS version 28, researchers can effectively analyze their data and derive meaningful interpretations to advance their research objectives.

❑ ومن خلال استخدام هذه التحليلات الإحصائية المتنوعة ضمن الإصدار 28 من برنامج SPSS، يمكن للباحثين تحليل بياناتهم بشكل فعال واستخلاص تفسيرات ذات معنى لتعزيز أهدافهم البحثية.



Thank You