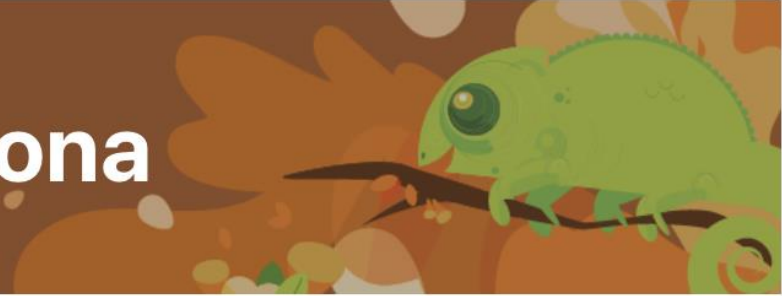# RSE Webinar - 10/19, 4-5pm Arizona

Invitation to attend a Webinar: Sample Size in Qualitative and Quantitative Research

General You are invited to join us for a webinar on focused on Sample Size in Qualitative and Quantitative Research. Please see the details about the webinar below:

Webinar Title: Sample Size in Qualitative and Quantitative Research

Focus: Research Tools and Skills

Host: Dr. Jim Rice

When: Thursday, October 19, 2023; 4:00 pm to 5:00 pm (Phoenix Time)

Where: Blackboard

Description: This webinar provides ways to identify sample sizes for quantitative and qualitative designs. Participants may bring their examples to discuss.

Qualitative and Quantitative Research Studies

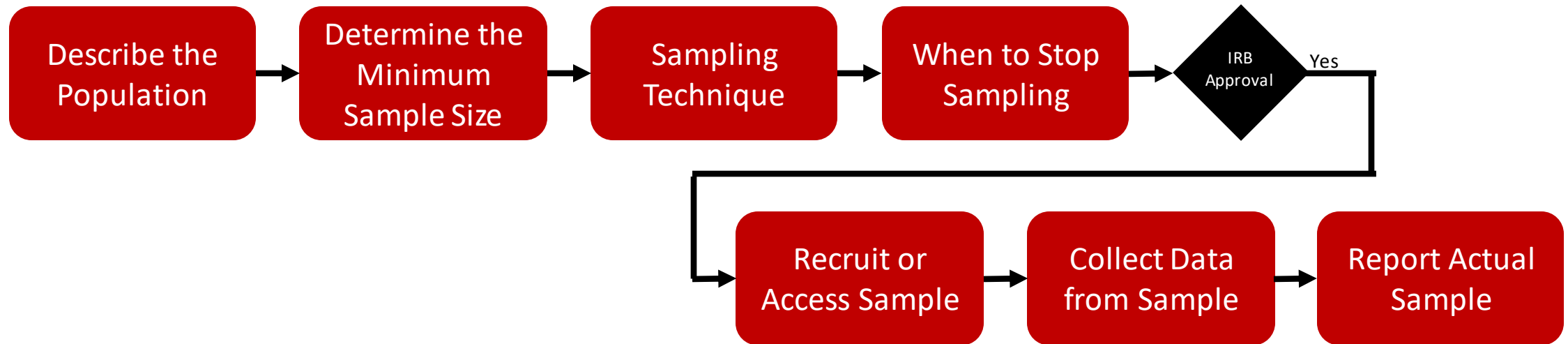Population Samples: Technique Selection and Size Determination

Dr. Jim Rice

jamescrice@email.phoenix.edu

POPULATION AND SAMPLE

Anatomy of the Section – Sample Size Considerations

Anatomy of the Section

Chapter 1 of the dissertation proposal provides an essential overview of the research population the study is designed to explore. This section must be crisp, and the details of the sampling technique are presented in Chapter 3.

Population and Sample

Introduce the section and describe its organization

Population

Describe the population, any delimitations, its (estimated) delimited size, and demographic data used for sampling controls for non-random samples and support with current literature.

Sample

Identify the proposed sampling technique **minimum** sample size, identify how the determination of the total sample is determined, and describe sampling controls used to ensure the sample represents the population.

The focus of research is to collect data from a defined collection of subjects within a defined geography. This total group is called a population.

A population may consist of people (ex. Hispanic Engineering Employees in Small Business in Georgia and Florida) or clearly defined objects (ex. The Shoes of North American Marathon Runners)
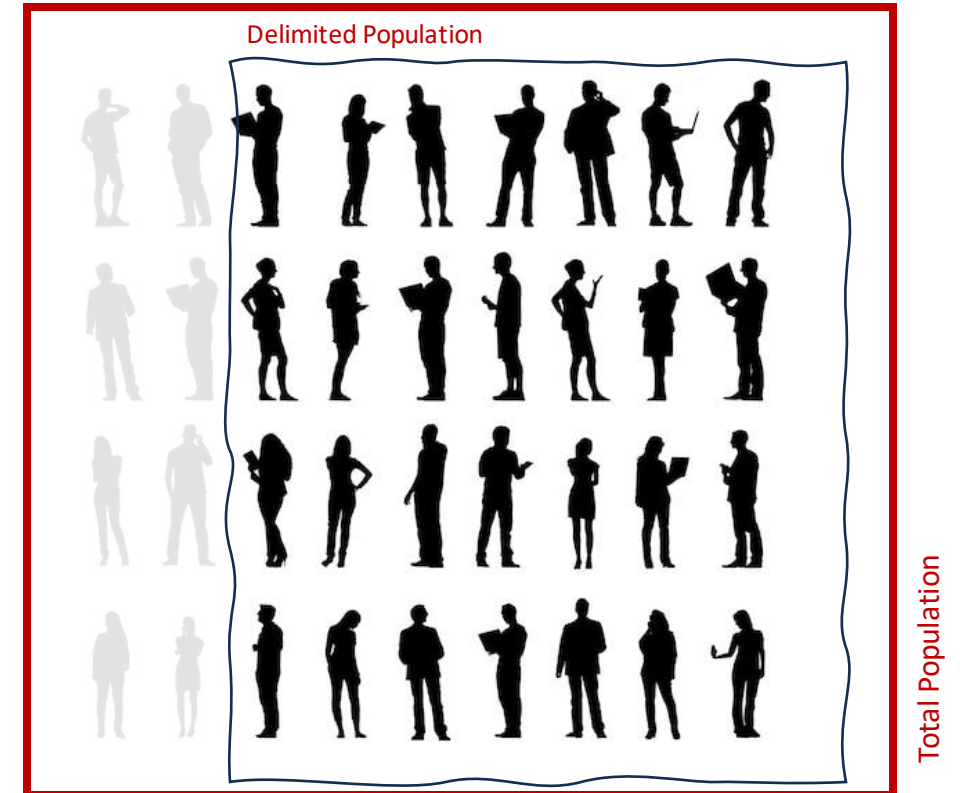
Total Population

Researchers may constrain the scope of the study population to limit contributions from potential members that could bias the results. This is called a delimited population. *The research must justify the delimitation.*

(ex. Hispanic Engineering Employees in Small Business in Georgia and Florida *who are currently employed full-time*.)
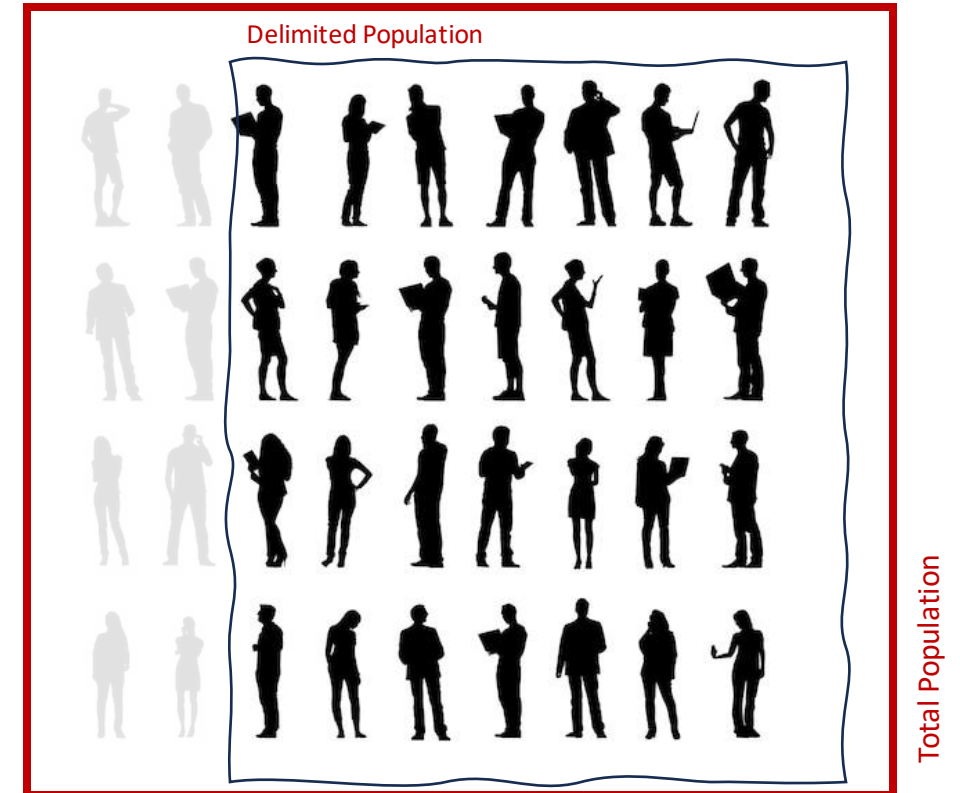

Delimited Population

Total Population

What must be included when describing the research population

- A population description
- Any delimitations determined by the researcher
- The estimated size of the population
- *If a non-random sampling technique is proposed and used*, demographic information must be included that is used for sampling controls to ensure a representative sample can be collected.


Delimited Population

Total Population

The Source of Data in Research - Sample

To collect data from a population, researchers identify a minimum sample from the delimited population to ensure the data represents the population. This is done by using an established sampling technique appropriate to the research methodology and design.

For all qualitative research, sampling controls based on the population demographics are required to ensure the sample represents the population. Controls are a best practice, but not required, for quantitative research.
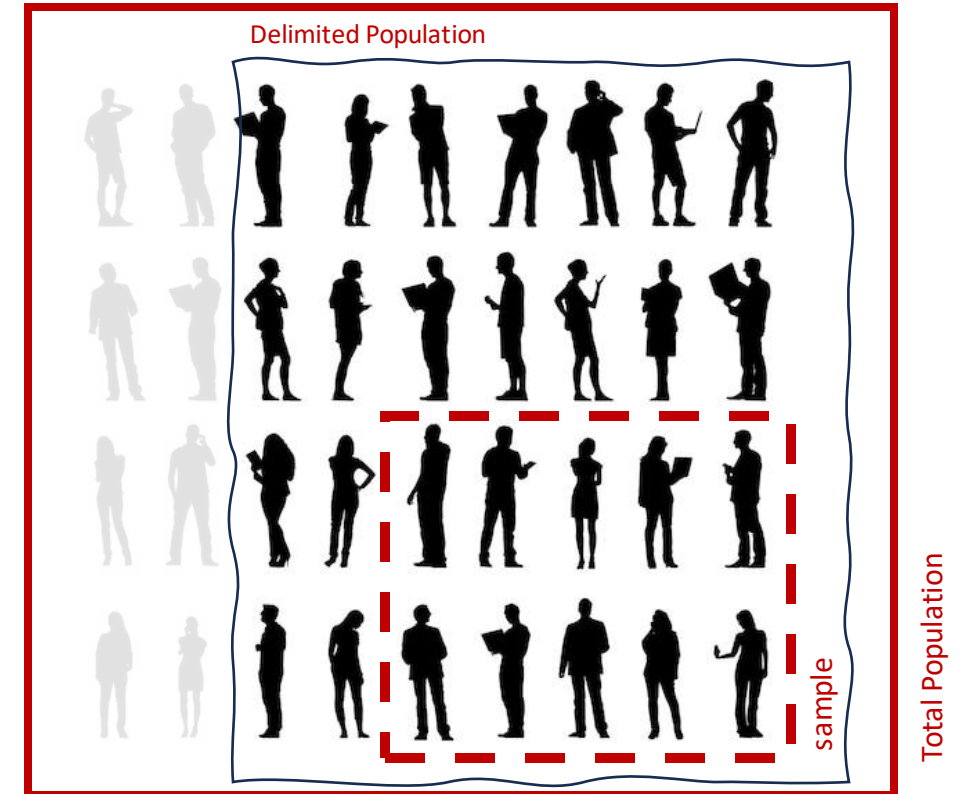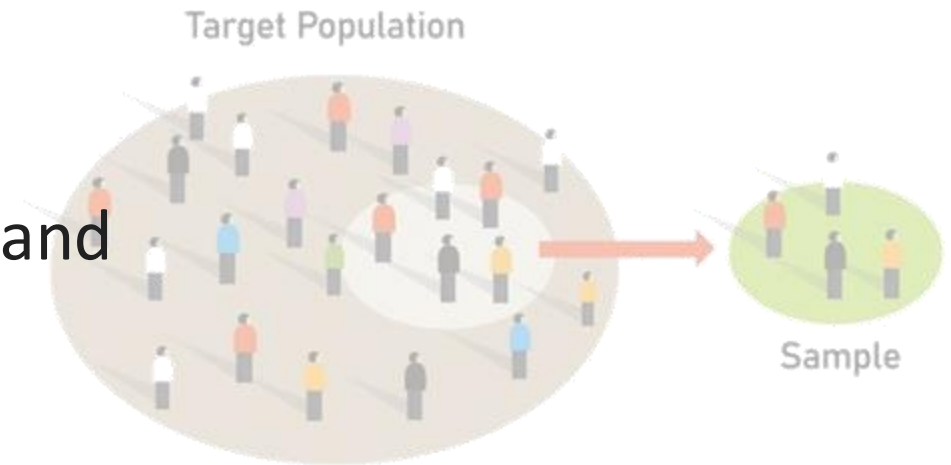

NOTE: The minimum sample size must be supported by authoritative references for the (proposed) research design.

Many authoritative primary references describe different sample sizes for designs and population profiles. The expectation for a *minimum* sample size *will* vary based on the proposed *methodology, design, population nature*, and the *topic* explored.

NOTE: Proposals should include citations to authoritative sources for the proposed minimum representative sample size and determine when sampling will be concluded for any research proposal. The sample size must be appropriate for the nature of the population and proposed research design.
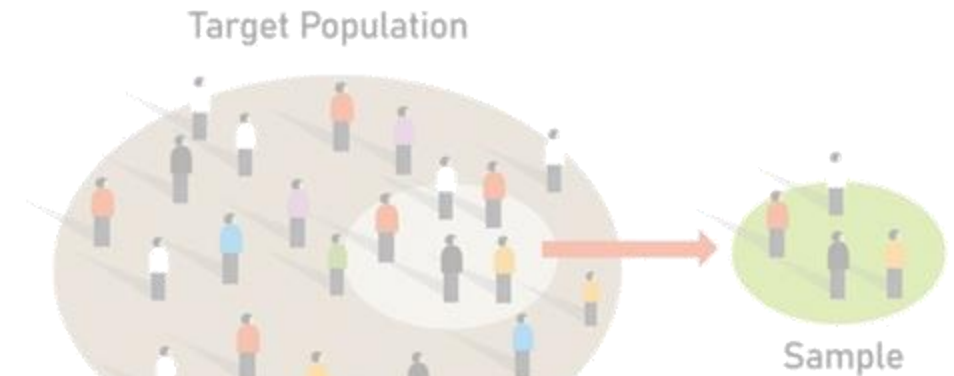
POPULATION AND SAMPLE

Anatomy of the Section – Minimum Sample??

A research proposal must describe the *minimum* sample size required to represent the population.

The *minimum* number is used in the IRB application to ensure the researcher can recruit and collect data from enough participants to reach significance or data saturation.

Researchers will commonly continue to collect data *above the minimum* level until saturation is reached AND sampling controls are satisfied.

Researchers report the actual significance, results of sampling controls, and sample sizes as a part of the findings of the research.

Target Population

Sample

	Popukation	Population	Sample	Sample
purple	2	9.1%	0	0.0%
red	5	22.7%	1	25.0%
white	6	27.3%	1	25.0%
black	3	13.6%	1	25.0%
blue	2	9.1%	0	0.0%
orange	3	13.6%	1	25.0%
green	1	4.5%	0	0.0%
n	**22**	100.0%	4	18.18%

CI	80%
Error	30%
Sample Size	4

NOTE: Although reasonably representative, a sample of 4 is insufficient based on the power analysis for *quantitative* research.

Quantitative Samples

POPULATION AND SAMPLE

Anatomy of the Section - Quantitative

Quantitative Research is comprised of numbers collected from surveys or secondary data sources.

NOTE: When secondary data sources are used, the population is the data and not the subjects the data represents.

NOTE: A power analysis is always used to determine the minimum sample size of a quantitative study design. A student can use any "free" power analysis tool available online.

NOTE: Most researchers in business disciplines use a 92% Confidence Interval (CI) and a 10% Error Rate for primary data and 95% CI and 5% ER for secondary data.

Population (Delimited)

- The *description* of the population of the proposed research is designed to study.
- A *delimitation* may be used to minimize the number of variations in the population that could skew the results.
- The description must include an estimate of the total *delimited population size.*
- The description must include *demographic* information used to create sampling controls unless a random sampling process is used.

Sample

- Describe the *sampling technique* used to invite participants to the study (convenience, random, snowball, etc.)
- Assert the *minimum sample size* required to conduct the study. This must be supported by *authoritative primary source literature* relating to the design.
- Describe the *sampling controls* used to ensure the sample represents the population (such as aligning the ratio of men/women in the sample to the ratio of men/women in the population.)
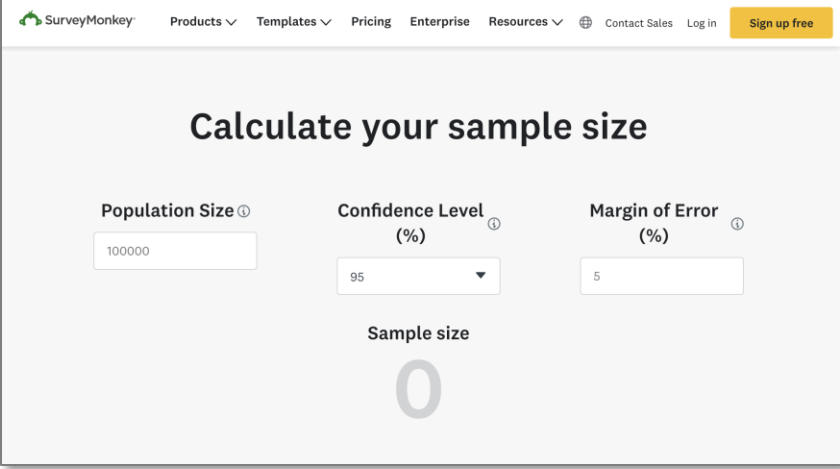
POPULATION AND SAMPLE

Anatomy of the Section – Power Analysis

In quantitative research, a power analysis is used to determine the *minimum* sample size in a proposal AND assessing the actual power of the statistic after the actual sample is collected and analyzed.

This may be done by manually or through any number of free available tools.

Survey Monkey

https://www.surveymonkey.com/mp/sample-size-calculator

G*Power

https://www.psychologie.hhu.de/arbeitsgruppen/allgemeine-psychologie-und-arbeitspsychologie/gpower

References

Das, S., Mitra, K., & Mandal, M. (2016). Sample size calculation: Basic principles. *Indian Journal of Anaesthesia*, *60*(9), 652–656. https://doi.org/10.4103/0019-5049.190621

Kadam, P., & Bhalerao, S. (2010). Sample size calculation. *International Journal of Ayurveda Research*, *1*(1), 55–57. https://doi.org/10.4103/0974-7788.59946
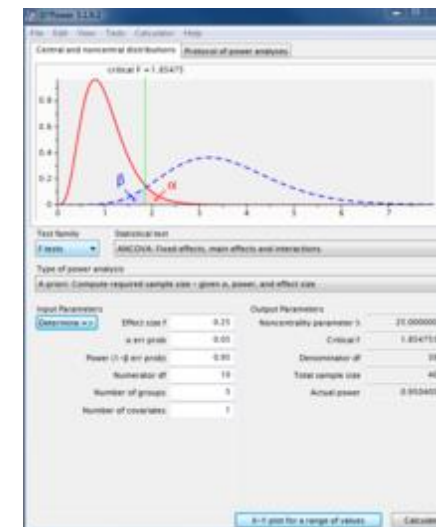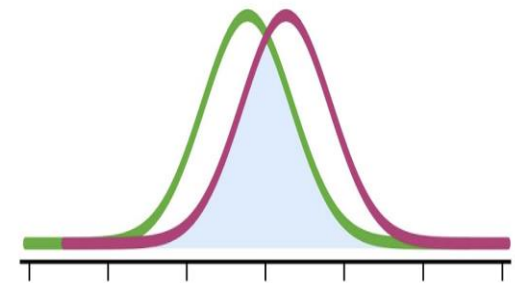
POPULATION AND SAMPLE

Anatomy of the Section – When to Stop Sampling

Statistical Significance

- **Purpose**: Statistical significance is a concept used in statistics to determine whether an observed effect or relationship in a data set is likely to be a real and meaningful finding or if it could have occurred by chance. In other words, it helps researchers assess whether the results they have obtained are statistically meaningful or merely the result of random variability.
- **Sampling Implication**: The significance of the hypothesis test is determined by the number sampling points in relation to the total population size and increases tangentially
- **Role**: The power analysis used to determine statistical significance helps a researcher efficiently allocate research resources and determine the feasibility of a research proposal.
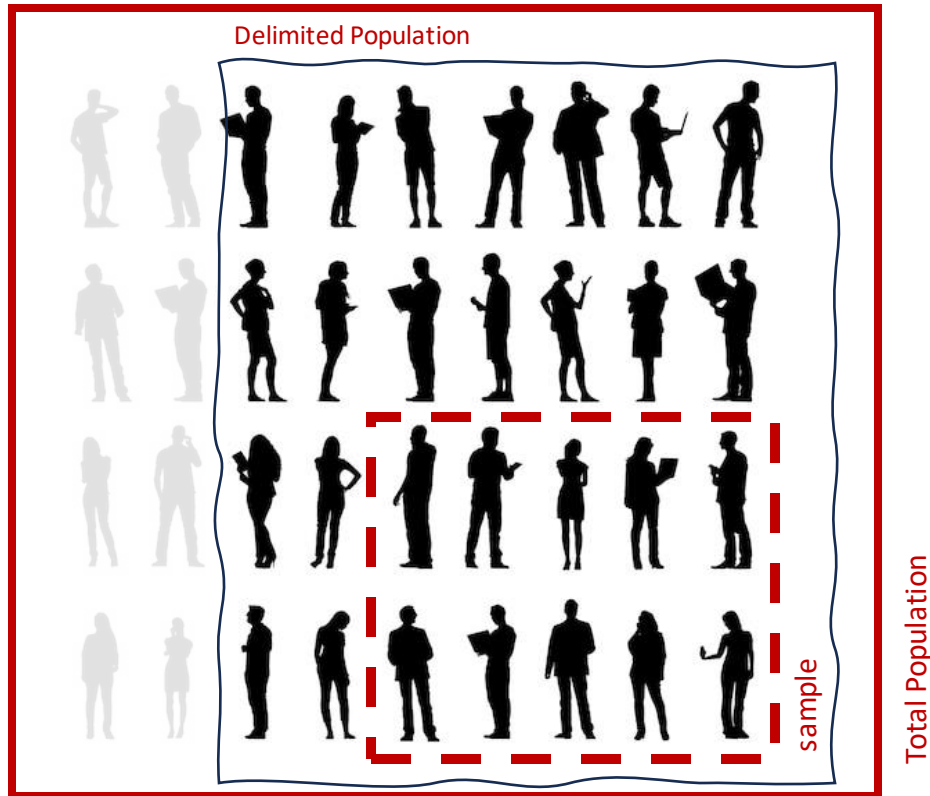
Quantitative Samples

POPULATION AND SAMPLE

Anatomy of the Section - Qualitative

Chapter 1 contains the overview of the proposed population and the proposed population sample for the research.

Delimited Population

sample

Total Population

Population (Delimited)
- The *description* of the population of the proposed research is designed to study.
- A *delimitation* may be used to minimize the number of variations in the population that could skew the results.
- The description must include an estimate of the total *delimited population size.*
- The description must include *demographic* information used to create sampling controls unless a random sampling process is used.

Sample
- Describe the *sampling technique* used to invite participants to the study (convenience, random, snowball, etc.)
- Assert the *minimum sample size* required to conduct the study. This must be supported by *authoritative primary source literature* relating to the design.
- Describe the *sampling controls* used to ensure the sample represents the population (such as aligning the ratio of men/women in the sample to the ratio of men/women in the population.)

Sampling is concluded based on the sampling technique used and the research design. The following are some example criteria that must be explained and supported by citations and references in the Population and Sample section:

Target Population
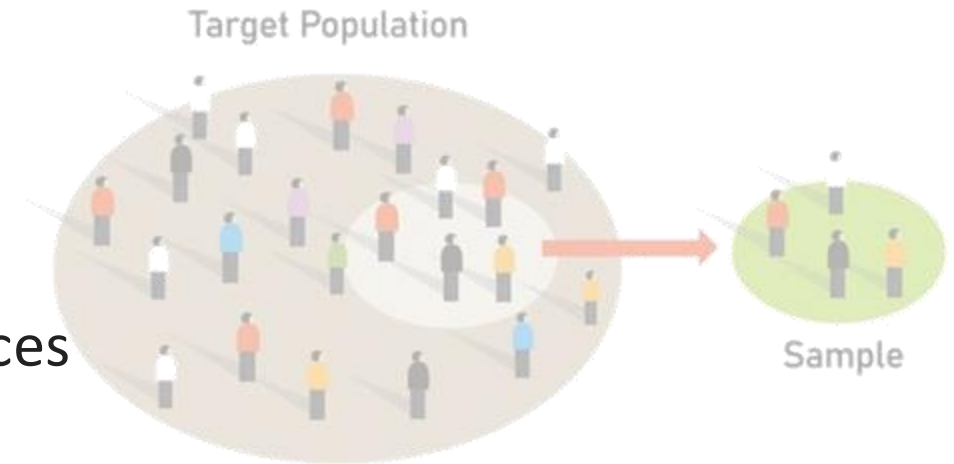
Sample

Qualitative: (Narrative, Phenomenology) The minimum sample size is reached _AND_ all sampling controls are met _AND_ thematic **saturation** is achieved.

Qualitative: (Case Study) **Triangulation** requirements are met. (2 or more sources; including a stratified population sample)

Anatomy of the Section – Sample Sizes

Qualitative research involves the collection and analysis of non-numerical data to understand social phenomena, human behavior, and experiences. Sampling in qualitative research is the process of selecting a subset of individuals, cases, or data points from a larger population or dataset to study in-depth. Qualitative sampling techniques ensure that the selected sample is representative of the research question or topic of interest.

Population

Sample

POPULATION AND SAMPLE

Anatomy of the Section – Sampling Techniques

Purposive Sampling

- **Purpose**: Researchers select participants or cases based on specific criteria that are relevant to the research question. This technique is often used when researchers want to study a particular group or phenomenon.
- **Example**: Selecting participants who have experienced a specific event or who possess certain characteristics related to the research topic.

Snowball Sampling

- **Purpose**: This method is used when the target population is hard to reach or identify. It involves starting with one or a few participants who are then asked to refer other potential participants.
- **Example**: Studying a hidden or stigmatized population, such as drug users or sex workers, where initial contacts can help identify and recruit others.

Convenience Sampling

- **Purpose**: Researchers select participants who are readily available and easy to access. This method is quick and convenient but may not yield a representative sample.
- **Example**: Surveying people in a nearby park or interviewing students in a specific class.

CAUTION: Great care must be taken to avoid researcher and confirmation bias

POPULATION AND SAMPLE

Anatomy of the Section – Sampling Techniques

Random Sampling

- **Purpose**: While random sampling is more commonly associated with quantitative research, it can be used in qualitative research as well. Researchers randomly select participants from the larger population to minimize bias.
- **Example**: Using a random number generator to select participants from a list of potential interviewees.
- *NOTE: Does not require a sampling control, but the best practice is to include one for reporting*

Case Study Sampling

- **Purpose**: In case study research, researchers select specific cases or instances (individuals, organizations, events) that are rich in data and can provide in-depth insights into the research question.
- **Example**: Studying a single company's response to a crisis event to gain a deep understanding of its decision-making processes.
- *NOTE: Case Study Research must include at least three types of data used for triangulation*

Stratified Sampling

- **Purpose**: Researchers divide the population into subgroups (strata) based on relevant characteristics and then sample from each stratum. This ensures representation from all key subgroups.
- **Example**: In a study on healthcare access, stratifying the sample by age groups (e.g., young adults, middle-aged, and elderly) to ensure diversity in perspectives.

Anatomy of the Section – Sampling Techniques

Maximum Variation Sampling

- **Purpose**: This technique aims to capture a wide range of perspectives by deliberately selecting participants who vary in terms of certain characteristics or experiences related to the research topic.

- **Example**: Interviewing people from different age groups, socioeconomic backgrounds, or geographic locations to understand variations in their views on climate change.

Theoretical Sampling

- **Purpose**: Commonly used in grounded theory research, theoretical sampling involves selecting new participants or cases based on emerging themes or theories from ongoing data analysis. It helps refine and develop theory.

- **Example**: In a study on workplace dynamics, researchers might select additional participants based on patterns that emerge during data analysis.

NOTE: *Not commonly used in dissertation research designs*

Researchers choose a qualitative sampling technique and justify it based on the best fit for their research objectives, their population characteristics, and the research design for the study. The choice of sampling technique should align with the research question and the level of depth and diversity required for the study's findings.

Regardless of the technique chosen, the researcher must establish sampling controls to ensure the sample *avoids the potential for researcher bias* AND *is representative of the population.*

POPULATION AND SAMPLE

Anatomy of the Section – Choosing a Minimum (and Final) Sample Size

Determining the appropriate (minimum) sample size for qualitative research is not as straightforward as it is in quantitative research, where statistical calculations can guide the process.

In qualitative research, sample size is typically determined by factors related to the research question, the nature of the study, and the concept of data saturation.

Factors to Consider
- Research objectives and scope
- Data Saturation (*at or above the minimum*)
- Center of Interest or Phenomena Nature
- Resources and Time Constraints
- Research Design
- (Theoretical | Conceptual) Framework
- Ethical Considerations
- Consultation
- Precedence

NOTE: *Most qualitative dissertation proposals rely on precedence and use an average of 3 to 4 cited peer-reviewed sources from SMEs for the proposed research design as the minimum sample size.*
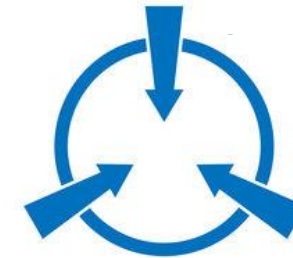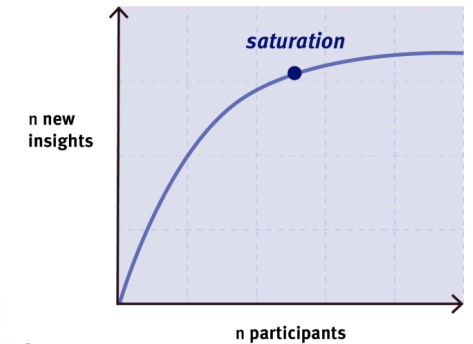
Anatomy of the Section – When to Stop Sampling

Data saturation and **triangulation** are two important concepts in qualitative research. While they serve different purposes, they both contribute to the rigor and credibility of qualitative research.

Data saturation focuses on the depth and comprehensiveness of data collected from a specific sample

Triangulation involves the use of multiple sources or methods to cross-verify and enrich the research findings. Both concepts contribute to the credibility and trustworthiness of qualitative research, but they serve different purposes within the research process.


saturation

n new insights

n participants

Anatomy of the Section – When to Stop Sampling

Data Saturation:

- **Purpose**: Data saturation is a concept specific to qualitative research. It refers to the point at which no new information or themes are emerging from the data. In other words, researchers continue collecting data until they feel that they have captured a comprehensive understanding of the phenomenon under investigation.
- **Sampling Implication**: Data saturation influences sample size determination. Researchers aim to achieve saturation, and sample size is often determined by when this point is reached. Smaller samples may be sufficient if saturation is quickly achieved, while larger or more diverse samples may be needed if saturation takes longer to reach.
- **Role**: Data saturation ensures that researchers thoroughly explore and understand the research topic. It enhances the credibility and validity of the findings by demonstrating that the researchers have considered a wide range of perspectives.
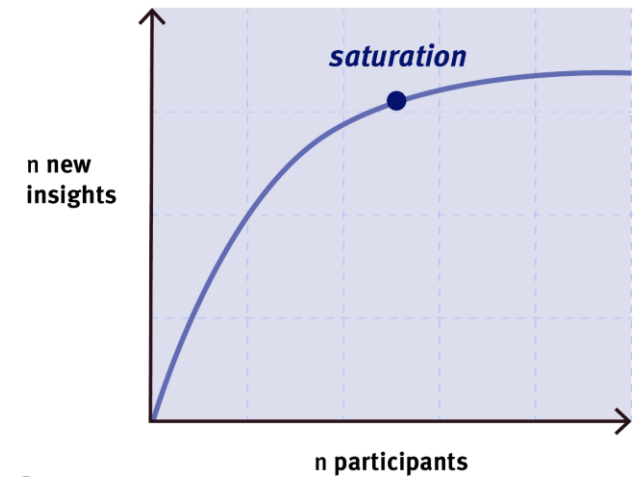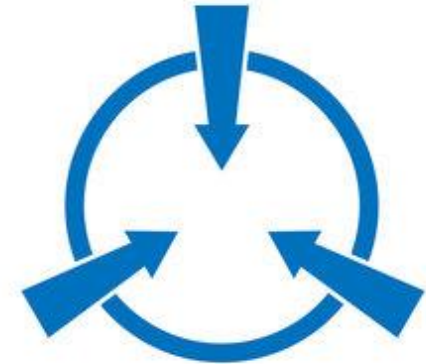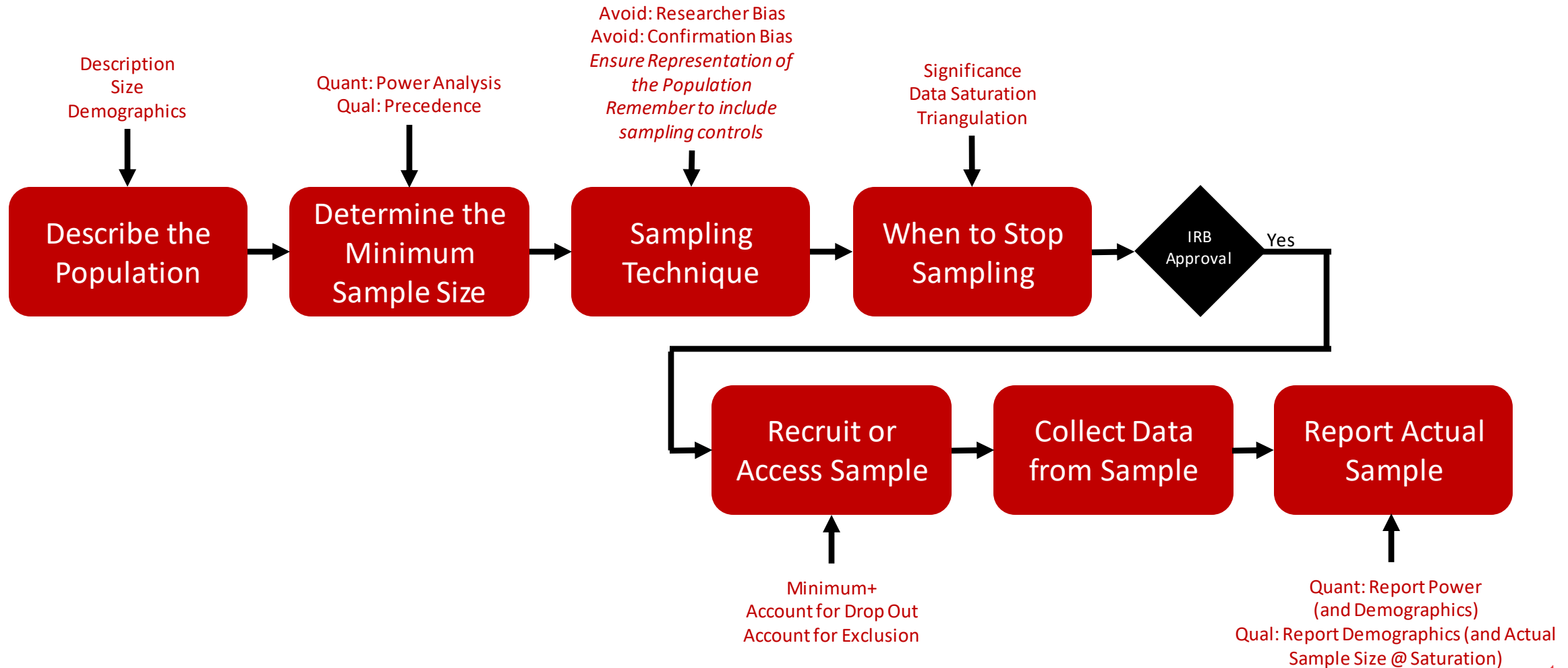
Anatomy of the Section – When to Stop Sampling

Triangulation

- Purpose: Triangulation is a methodological approach that involves using multiple sources, methods, or data points to corroborate findings, enhance the credibility of the research, and provide a more comprehensive understanding of the phenomenon.
- Sampling Implication: Triangulation often involves selecting participants or data sources from different backgrounds, contexts, or perspectives. Researchers intentionally include multiple sources of data to cross-check and validate their findings.
- Role: Triangulation helps mitigate potential bias and strengthens the reliability and validity of qualitative research. By collecting data from various sources or using different methods, researchers can build a more robust and well-rounded picture of the phenomenon they are studying.

Anatomy of the Section – Summary

Description
Size
Demographics

Quant: Power Analysis
Qual: Precedence

Avoid: Researcher Bias
Avoid: Confirmation Bias
Ensure Representation of the Population
Remember to include sampling controls

Significance
Data Saturation
Triangulation

Describe the Population → **Determine the Minimum Sample Size** → **Sampling Technique** → **When to Stop Sampling** → IRB Approval — Yes →

Recruit or Access Sample → **Collect Data from Sample** → **Report Actual Sample**

Minimum+
Account for Drop Out
Account for Exclusion

Quant: Report Power
(and Demographics)
Qual: Report Demographics (and Actual Sample Size @ Saturation)