Research Methodology

(Specialization in Practical Survey Method)

Topics covered

- What is Research?
- Research Process
- Research Design
- Sampling Methodology
- Sampling Size calculation
- Data Collection Mode
- Survey Method
  - Questionnaire Development
  - Data coding and analyzing
  - Reporting
- Research Ethics

What is Research?

Research is:

the systematic process of collecting and analyzing information (data) in order to increase our understanding of the phenomenon about which we are concerned or interested.

What is Social Research?

Social Research is:

a broad term which includes any research looking at social questions

Research Methodology

Research methodology is a way to systematically solve the research problem. It may be understood as a science of studying how research is done scientifically.

- Methodology
  - **An overall approach**
    - Ethnography
    - Survey
- Methods
  - **Parts of methodology**
    - Interview, observation
- Tool, Techniques,
  - **Specific ways of getting data**
    - Use of photos, mapping
    - Questionnaires

Quantitative Vs Qualitative?

- Research question guides the choice
- Choice of method is situational
- Complementary
  - Research more complete with both
- Depending on time and resources

Two Main Types of Methodologies

- Quantitative research aims at (causal) *Explanation.* It answers questions about relationships among measured variables with the purpose of explaining, predicting and controlling phenomena. It answers primary to *WHY? -questions.*

- Qualitative research aims at understanding. It is used to answer questions about the complex nature of phenomena, often with the purpose of describing and understanding the phenomena from the participants' point of view. It answers primarily to *HOW?* –questions.

- Both qualitative and quantitative research can aim at *Description* of social reality.

Quantitative

- Based on the idea that social phenomena can be *quantified, measured* and *expressed numerically.*
- The information about a social phenomenon is expressed in numeric terms that can be analyzed by statistical methods.
- The observations can directly numeric information or can be classified into numeric variable.
- Observation are transformed into a data matrix in which each observation unit occupies one row and each variable one column.
- The data matrix is the starting point for the analysis.

Strengths of Quantitative Research

- Enables the research and description of social structures and processes that are not directly observable.
- Well-suited for quantitative description, comparisons between groups, areas, etc.
- Description of change
- Analysis and explanation of (causal) dependencies between social phenomena.

Advantages of Qualitative Methods

- Better understand phenomenon and gain new perspectives
- Collect and explore in-depth information that cannot be conveyed quantitatively
- Allow for subjects to interact with environment (Naturalistic)
- Provide rich descriptions of complex phenomena
- Explore the issues of difficult to access groups
- Explore sensitive topics
- Explore the cultural defined experiences
- Seeking to further develop theory

	Quantitative Methods	Qualitative Methods
Purpose	Seeks explanations and predictions to develop generalizations. Test theories	Seeks a better understanding of complex situations. Build theories
Concentration	On what can be measured. Objective data	On investigation subjective data, in particular, the perceptions of the people involved
Concepts	Designed before research begins	Begins with flexible concepts
Research process	Known variables, established guidelines, predetermined methods	Unknown variables, flexible guidelines, emergent methods
Sample	Large sample size, Probability based sample	Small sample size, Non-probability based sample

Section 2

Research Process

Defining the problem

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Research Design

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Research Methodologies

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Sampling

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Data Collection Methods

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Data Coding and Entry

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Data Analysis

↓

Conclusion and Report

Research Design

- A master plan specifying methods and procedures for collecting and analyzing needed information.
- Research question is a key
- Methodology guild application

Purposes of Research

- Exploratory Research
- Descriptive Research
- Explanatory or Causal Research

Exploratory

Causal or Descriptive

Absolute Ambiguity

Completely Certain

Exploratory Research	Descriptive Research	Causal Research
Unaware of Problem	Aware of Problem	Problem Clearly Defined
Some villagers are suffering form diarria, Why?	How much percent? Which factors?	Because of Water ? Is there relationship between and the water and the disease?

Exploratory Research

- Looking for patterns
- Undertaken when little or no information is available on how similar problems or research issues have been dealt with in the past
- Conducted to clarify and define the nature of a problem
- Conducted to discover new ideas
- Unstructured, Informal research undertaken to gain background information about the general nature of the research problem
- Provides usually qualitative data
- Subsequent research expected

Descriptive Research

- Fact finding
- Describes characteristics of a population or phenomenon or a particular situation
- Assumes some understandings of the nature of the problem
- Provides answers to the questions of:
  - Who
  - What
  - Where
  - When
  - How
- Cannot answer the question *WHY?*

Explanatory or Causal Research

- Explaining ***WHY*** and ***HOW***
- Explained the nature of certain relationships that exit among variables by using hypothesis
- To establish ***CAUSE-and-EFFECT*** relationships (causal research)
- If “x” then “y” ?

Section 3

Research Questions

- The core of research proposal
- Develop logically from the literature review (background, significance, preliminary studies)
- Logically lead to the research design
- Should not be too general or narrow

Objectives

Two types

- Goal or Purpose
  - A statement that describes the expected implications or contributions arising from the study and states what is expected to happen

- Objectives
  - A statement that states what will be done or what will be studied or what will be examined

Defining the Research Problem

- Once you've identified a research problem:
  - State that problem clearly and completely
  - Determine the feasibility of the research
- Identify sub-problems:
  - Completely researchable units
  - Small in number
  - Must be clearly tied to the interpretation of the data
- Definitions
  - Define each technical term as it is used in relation to your research project

- Problem definition allows clear research objectives, purpose, direction and design to be set with higher changes of collection necessary and relevant information.
- To prevent an error or omission in problem definition

Problem Definition

- Research objective can then be derived
- Research project can then be defined and decided
- Type of information to be collect and conceptual frame work of study can then be formulated.

For Example

Research Problem

Economic, Socio-cultural, and Environmental Impacts of Tourism Development in Myanmar

Purpose

The overall purpose is an attempt to better understand the impacts, both positive and negative, of tourism in Bagan in order to harness the positive impacts of tourism and mitigate the negative ones, thereby promoting sustainable tourism development.

Objectives

The objectives of the study are:

- to examine the driving factors of tourism and its role in Bagan;
- to assess and analyze the economic, socio-cultural and environment perceived impacts of tourism in Bagan;
- to find out strengths and weaknesses of tourism development in Nyaung U (Bagan); and
- to give suggestions and recommendations for better improvement of sustainable tourism development in Bagan;

Scope and Limitations

- Some
  - International Tourism
  - resident's perceptions of the impacts of tourism rather than an attempt to measure the actual effects
- Place
  - Nyaung U Township
- Time
  - Form 1997 to 2007

Title

Economic, Socio-cultural and Environmental Impacts of Tourism Development in Myanmar with Special Reference to Bagan Tourism **(1997 -2007)**

Group exercise 1
Day 1-M

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Section 4

Sampling

Basic Vocabulary of Statistics

POPULATION

A **population** consists of all the items or individuals about which you want to draw a conclusion. The population is the "large group."

SAMPLE

A **sample** is the portion of a population selected for analysis. The sample is the "small group."

PARAMETER

A **parameter** is a numerical measure that describes a characteristic of a population.

STATISTIC

A **statistic** is a numerical measure that describes a characteristic of a sample.

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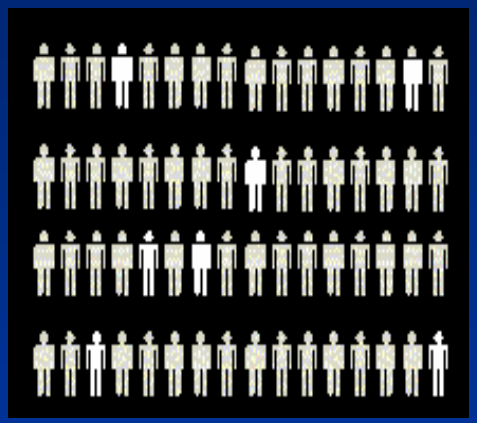
Population vs. Sample

Population



Sample

Measures used to describe the population are called parameters

Measures used to describe the sample are called statistics

Why Sample?

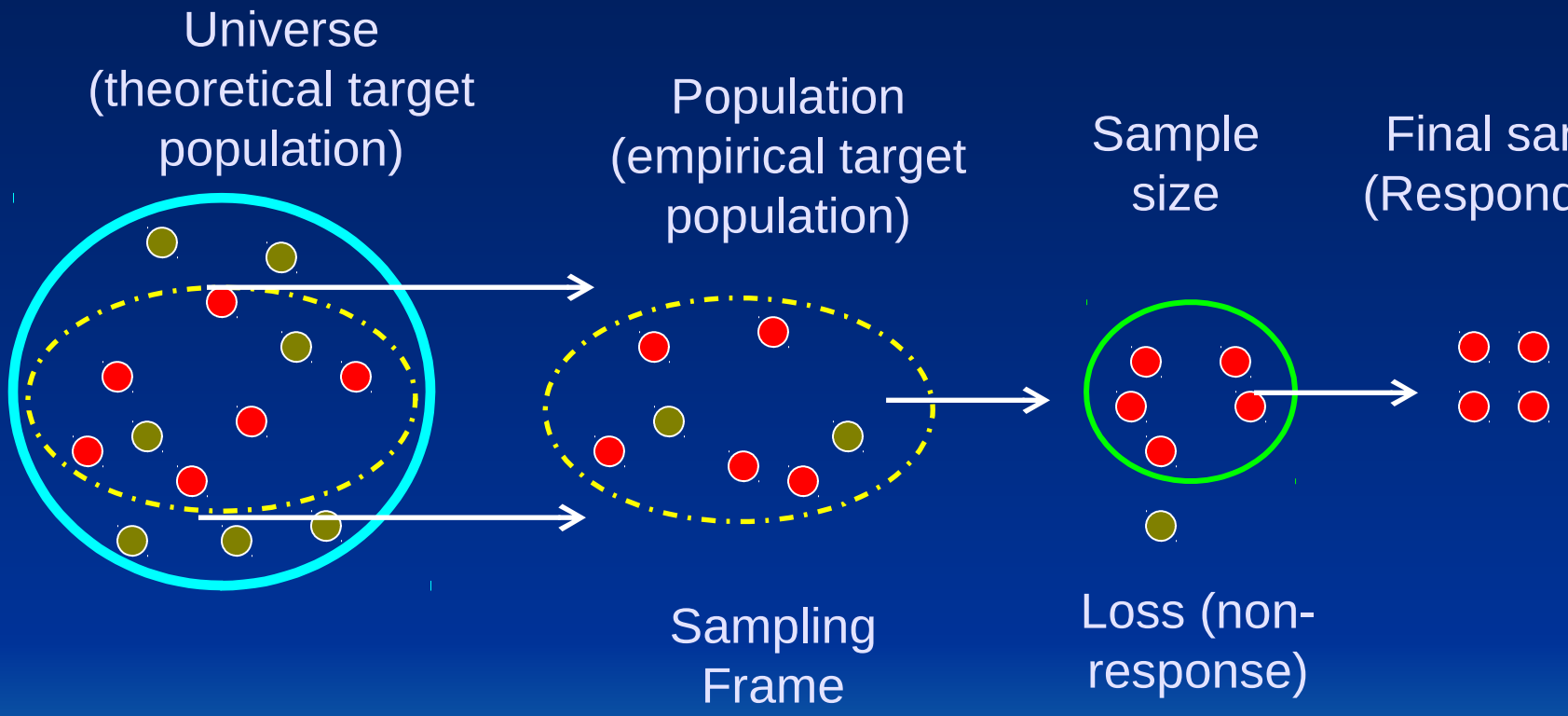
- Why not study everyone?
- Debate about Census Vs Sampling

Sampling

- any procedure that uses a small number of items or portion of population to make a conclusion regarding the whole population
- Being used because investigation of the whole population is not feasible or cost effective
- The aim is to produce a miniature copy of the population.
- Each member has an equal likelihood of being selected into the sample.
- The **population** is the group the researchers want to draw conclusion about
- A **sample** which accurately reflects the population from which it is drawn is a representative sample
- The **survey population** is the group the researchers actually draw a sample from (**sampling frame**)
- The **sample size** the group the researchers want to actually study (a small fraction of the population)

- Result of the good sample should have the same characteristics as the population as a whole

Sampling: central concepts



Sampling Three Questions

- First question is “who is going to be sampled?” **(Unit of analysis)**
  - i.e. Specifying the target population.
- Second question is ‘what sample size should we choose” **(Sample size)**
- Third question is ‘How will sample be selected” **(Sampling methods)**

Unit of Analysis

Research Unit

- Individual
- Group (e.g. family, household, couple,…)
- Institution, Organization or community (e.g. school, enterprise, …)
- Text (e.g. Newspaper, article, a novel, research,…)
- Event or Activity (e.g. war, strike, revolution, …)

Representativeness

- Equivalence of universe and population (sampling frame)
- Equivalence of population and sample
  - When sampling is done correctly these should be equivalent within a certain error margin
  - The bigger the sample, the lesser the likelihood of ***Sampling Error***
- Equivalence of original and final sample
  - 10%
  - The lager the sample size, the more accurate

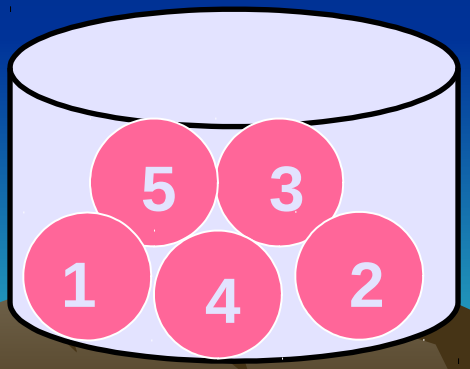
Sampling Techniques

- Probability Sampling
  - one in which each element of the population has a known non-zero probability of selection
  - Types
    - Simple Random
    - Systematic Random
    - Stratified Random
    - Random Cluster
    - Stratified Cluster
    - Multi-stage Random (Various Kinds)
- Non-probability Sampling
  - A sampling technique in which units of the samples are selected on the basis of personal judgment or convenience;
  - Types
    - Convenience
    - Purposive
    - Quota

Simple Random

- Each element in the population has an equal probability of selection
- Names drawn out of a container or box
- Random numbers to select elements from an ordered list

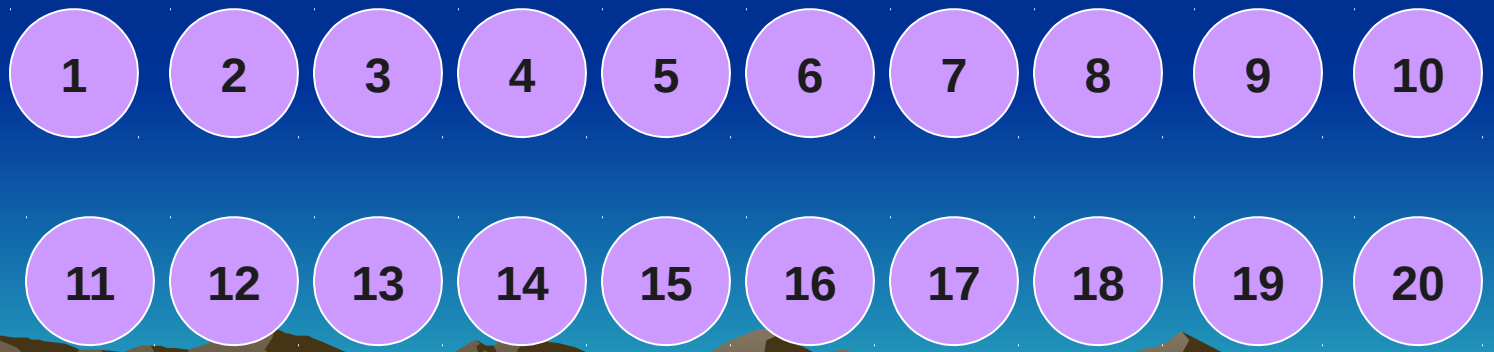
Sampling frame
5 Balls



Sample
2 Balls

Systematic Random

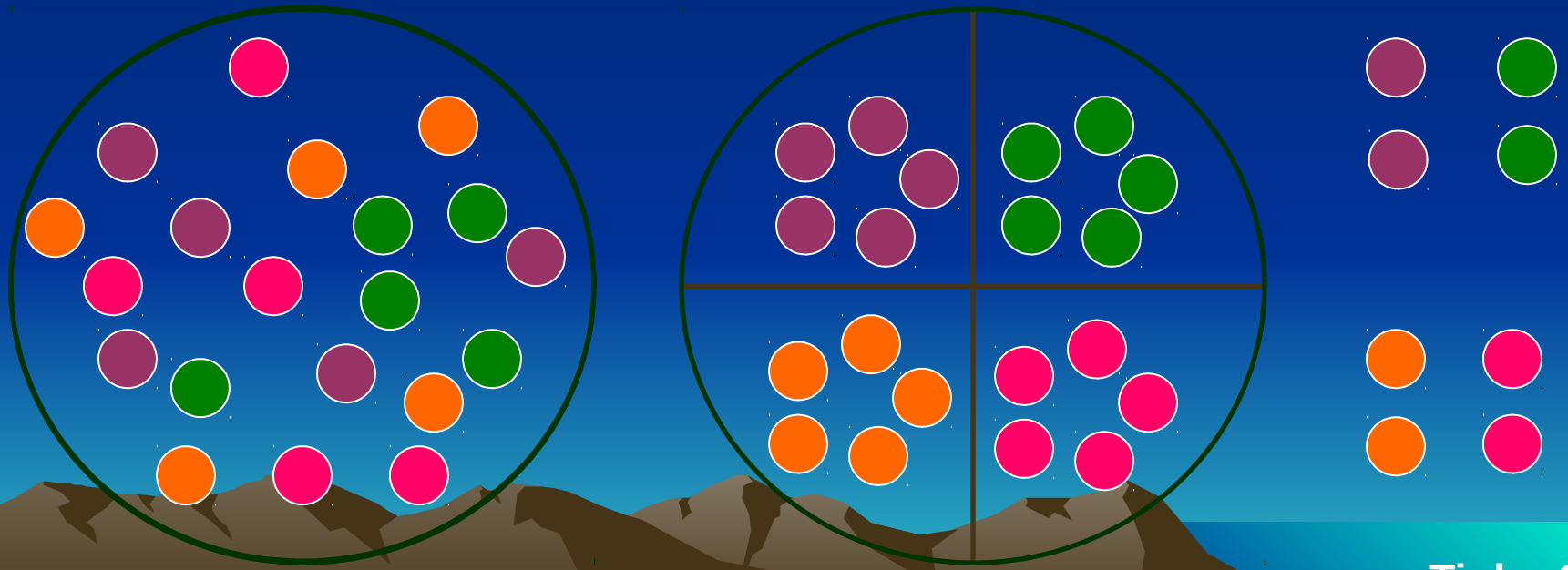
- Each element has an equal probability of selection, but combinations of elements have different probabilities
- Population size N, desired sample size n, sampling interval k=N/n
- E.g. If N=20, n=4, k=20/4=5



Stratified Random

- Divide population into groups that differ in important ways
- Select random sample from within each group

Sampling frame 20



Non-Probality sampling

There are no criteria or rules for sample size in this method. It should be determined based on information needs.

Convenience Sample

- Subjects selected because it is easy to access them

Purposive Sample

- Subjects selected for a good reason tied to purposes of research

Quota Sampling

- Pre-plan number of subjects in specified categories (E.g. 100 men, 100 women)
- Interviewer selects first available subject who meets criteria: is a convenience sample

Referral (Snowball) Sampling

- Each research participant who volunteers to be in the research study is asked to identify one or more additional people who meet certain characteristics and might be willing to participate in the research study.

Logic of Qualitative Sampling

Qualitative researchers begin with the followings:

- Who would be an information-rich data source for the study?
- Whom should the researcher talk to or What should he/she observe first?
- The first step is selecting settings with high potential for information richness.

Group exercise 2
Day 1-A

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Random Simple Sampling

Sample Size Calculation

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Simple size estimation

1. **Estimation of the sample size based on a PROPORTION**
2. ***Finite population correction factor***

Estimation of the sample size based on a PROPORTION

$$sample \quad size_{r} = \frac{Z^{2} * (p) * (q)}{e^{2}}$$

- *Confidence level = 95%*
- *Sample size $_r$ = the required sample size*
- *Z = Z value*
- *= 1.96 (for 95% confidence level)*

P = percentage of the population having the characteristic

= 0.5

q = 1 – p

= 1- 0.5 = 0.5

*e = margin of error (D*egree of Precision is the margin of error that is acceptable)

= 5%

= 0.05

Finite population correction factor

- *To estimate the NEW SAMPLE SIZE with a finite population correction factor*
- *With the exact number of the population, the sample size can be adjusted, using the following formula.*

$$New\ \ sample\ \ size = \frac{sample\ \ size_r}{1 + \frac{(sample\ \ size_r - 1)}{N}}$$

- *N = Population size*
- *New sample size = adjusted sample size*

Sample Calculation

The population size is 4,012 households.

Consider a margin of error of ± 6.5% will be accepted.

$$sample\quad size_{r} = \frac{Z^{2} * p * (q)}{e^{2}}$$

$$New\quad sample\quad size = \frac{sample\quad size_{r}}{1 + \frac{(sample\quad size_{r} - 1)}{N}}$$

Sample Calculation

A confidence level is considered at 95%. Thus, Z value is 1.96. As for the percentage of the population (p), since there are no data available on the proportion currently who have experiences in earthquake shakes, the research takes the worst case scenario and set p = 0.5. Consequently, q = 0.5. Regarding e, a margin of error of ± 6.5% will be accepted because it is a new study in this township.

Simple Calculation

$$sample\ size_{\ r} = \frac{1.96^2 * (0.5) * (0.5)}{0.065^{\ 2}}$$

$$= \frac{0.9604}{0.004225}$$

$$= 227.3136$$

= 227 Persons

= 227 Persons

$$New\ sample\ size = \frac{227}{1 + \frac{(227 - 1)}{4012}}$$

$$= \frac{227}{1 + 0.05633}$$

$$= \frac{227}{1.05633}$$

$$= 214.8949$$

$$= 215$$

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- https://www.surveysystem.com/sscalc.htm

Group exercise 3
Day 2-M

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Section 5

Data Collection

Interviews

Informal	**Recollecting discussion**
Unstructured **e.g. ethnographic interviewing**	**Allowing interview to proceed at respondent's pace and subjects to vary by interviewee**
Semi-structured	**Using an interview guide**
Structured	**Using identical stimuli and adheres to interview schedule**

Semi-structured Interview (Focus Groups Method)

- Ideal size: 6 – 12 persons and a note-taker
- Discussing a particular topic
- One focus group – unit of analysis
- Aid in understanding audience, group, users
- Small group interaction more than individual response
- Identifying why people feel certain way and elucidate steps in their decision-making process
- Identifying and filling gaps in current knowledge (perceptions, attitudes, feelings, etc.)
- Needing Series of groups for validity
- Homogeneity and anonymity in the group

Self Administered Questionnaires

- Easily to send the questionnaires
- Able to ask more complex questions
- No response effect
- No control over participant interpretation
- Low response rate
- Uncertainty about the who actually filled out the questionnaires
- Useless with non-literate, illiterate populations

Telephone Interviews

- Combining face-to-face personal quality with impersonal self-administered questionnaires
- Inexpensive and convenient
- Safe for interviewers
- Changing demographics
- Survey must be short

Face-to-face Interviews

- Able to interview even with the respondents who are in bedridden, illiterate, etc.
- Elicit more in-depth response or fill in information if participant doesn't understand the question

- Certainty about who answered the questionnaires
- Cost time and money
- Difficult for callbacks

Interviews

Modes of Data Collection (Interviews)

- Unstructured interview (In-depth interviews)
- Semi-structured interviews (Focus group interviews)
- Structured interview (Questionnaires)

Interviews

Informal	**Recollecting discussion**
Unstructured **e.g. ethnographic interviewing**	**Allowing interview to proceed at respondent's pace and subjects to vary by interviewee**
Semi-structured	**Using an interview guide**
Structured	**Using identical stimuli and adheres to interview schedule**

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- Homogeneity and anonymity in the group

Group exercise 6
Day 2-A

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Modes of Data Collection (Interviews)

- Structured interview (Questionnaires)
  - Face-to-face interviews
  - Telephone interviews
  - Self Administered Questionnaires
    - Postal questionnaires
    - E-mail questionnaires
    - Internet polls

What is MODE?

- Combination of *medium* and *agent* involved in data collection
  - medium = voice, text on screen, text on paper, video, wed, email
  - agent = interviewer, respondent (self-administration)

Mixed-Mode Design

- ***Concurrent mixed-mode design:***
  - One sample, one time point, one q'aire but different sample persons receive different modes; CHOICE
- ***Sequential mixed mode:***
  - One sample, one time point, sample members recruited in increasingly effective – and expensive – modes if previous contact attempts not successful

- ***Switch modes within questionnaire***:
  - One sample, one time point; different modes for different parts of questionnaire for same Rs
- ***Longitudinal mixed mode***:
  - One sample, multiple time points; same persons measured with different modes at different times
- ***Parallel (separate) mixed mode***:
  - Different samples, different modes

Section 6

Research Methods

Case Study

- A type of qualitative research in which in-depth data are gathered relative to a single individual, program, or event, for the purpose of learning more about unknown or poorly understood situation.
- Intensely investigates one or a few situations similar to the problem
- Focusing on individual or small group
- Conducting a comprehensive analysis from a comparison of cases
- Investigate in depth rather breadth
- Careful Study
- Require co-operation
- Time consuming

Example

- Very Poorest Nargis' Victims in Thazin Kone Village

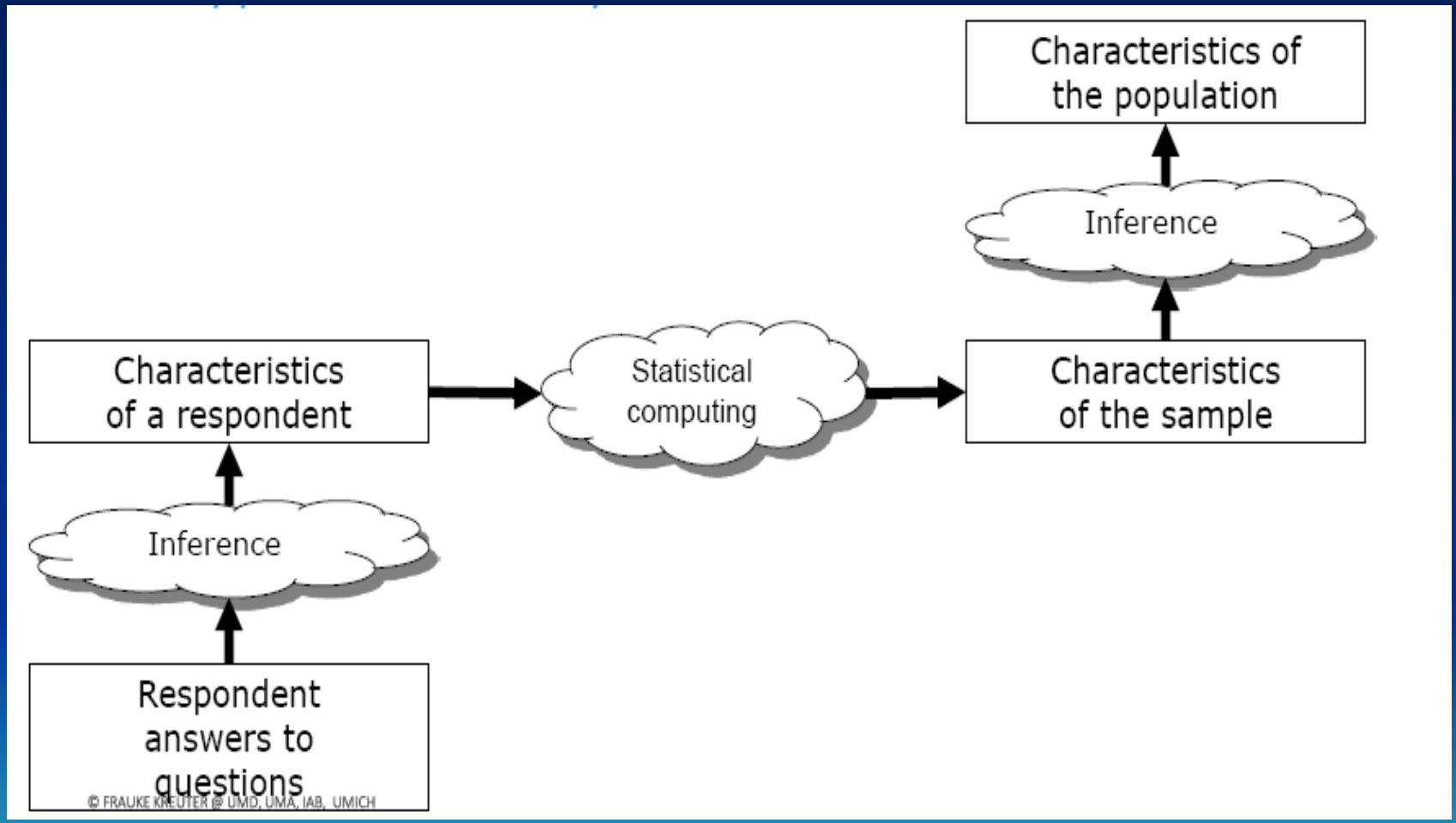
Observation Study

- A quantitative research in which a particular aspect of behavior is observed
  - Participant Observation

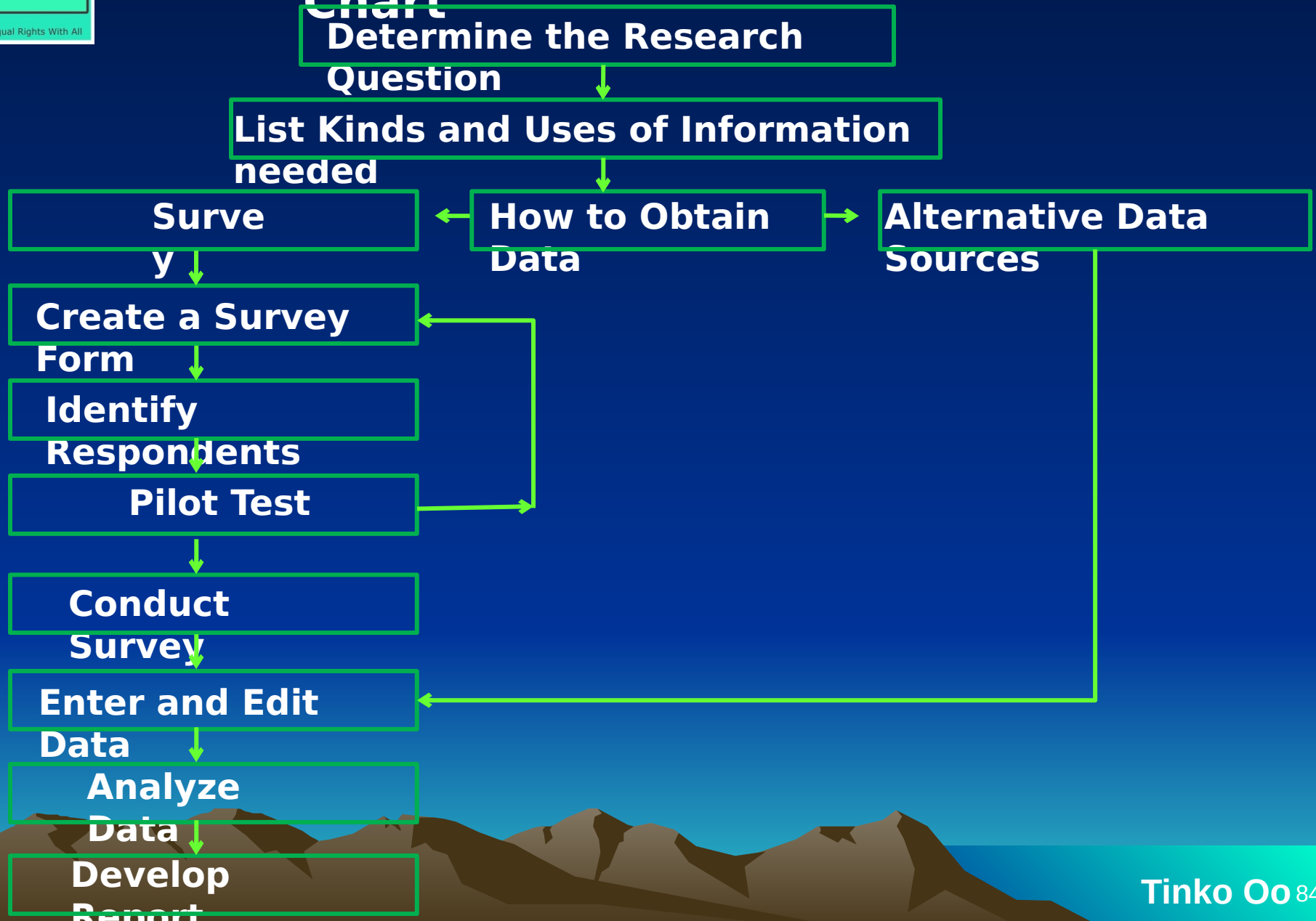
    Involving a researcher who is engaged as a participant in a social context and who researches by observing and analyzing what is happening.
  - Non-participant Observation

Survey Method

Two Types of Survey Inference



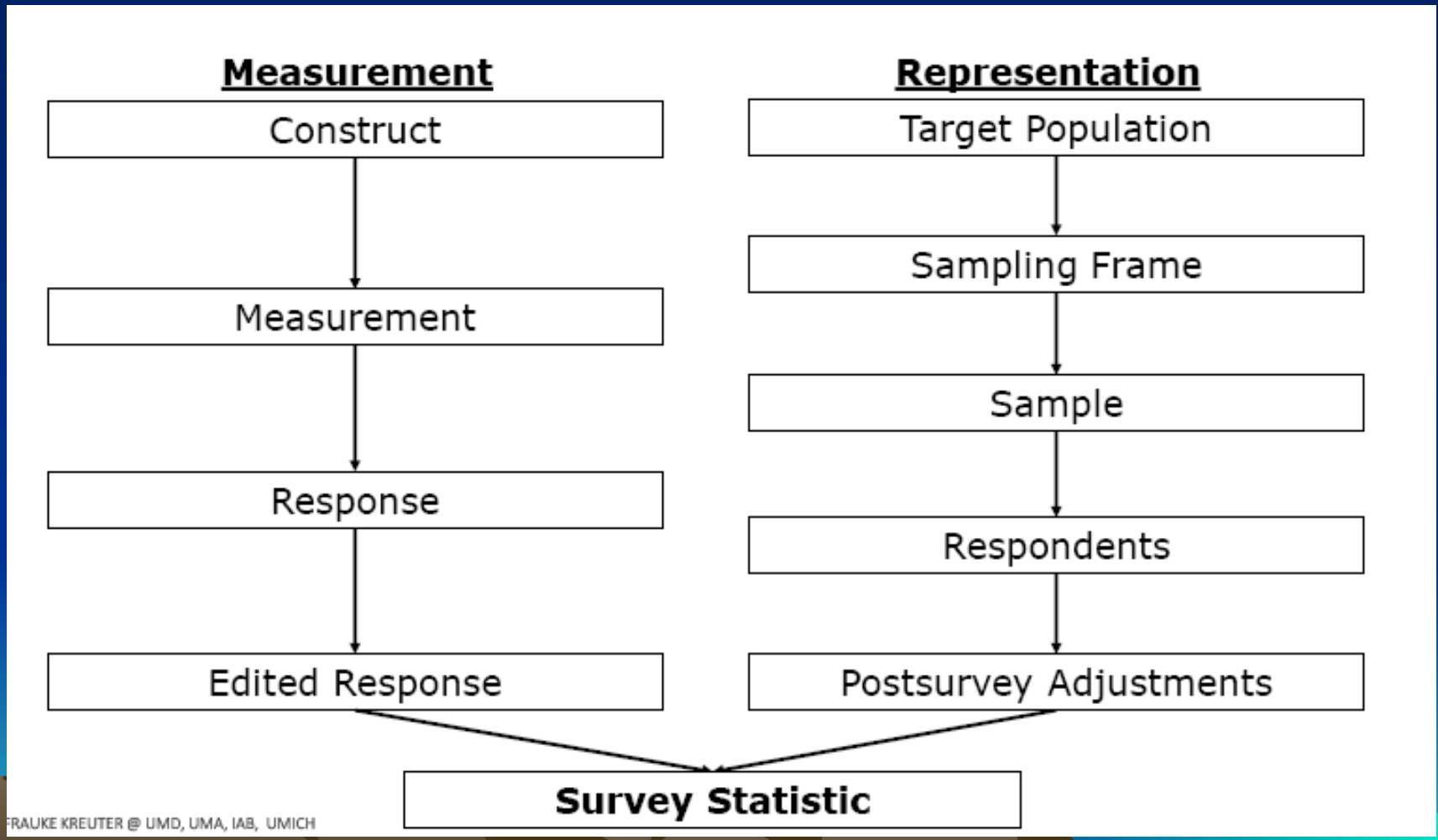
Survey Process Flow Chart



Three Perspectives on the Survey Lifecycle

- From a design perspective
- From a process perspective
- From a quality perspective

Survey Lifecyle from a Design Perspective



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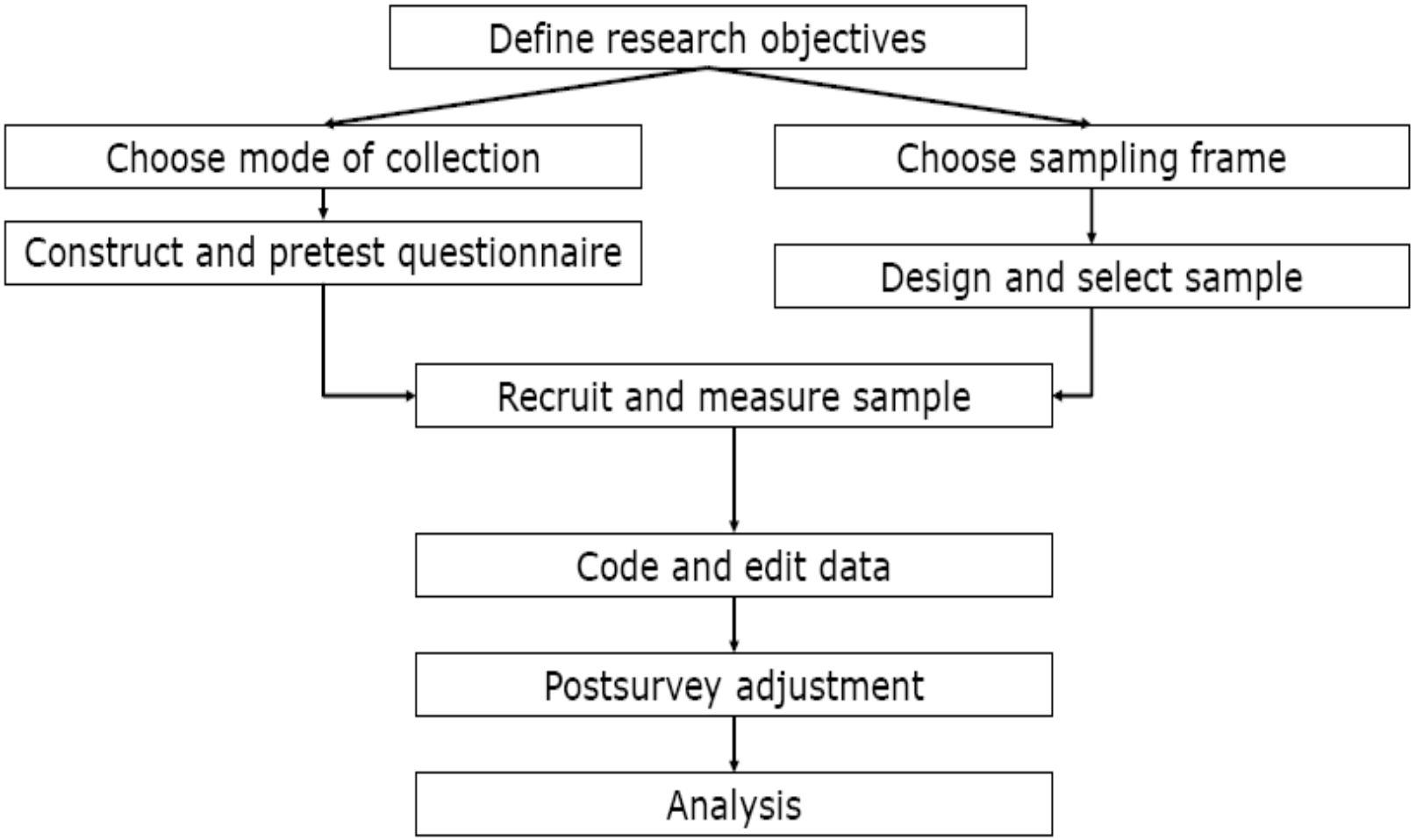
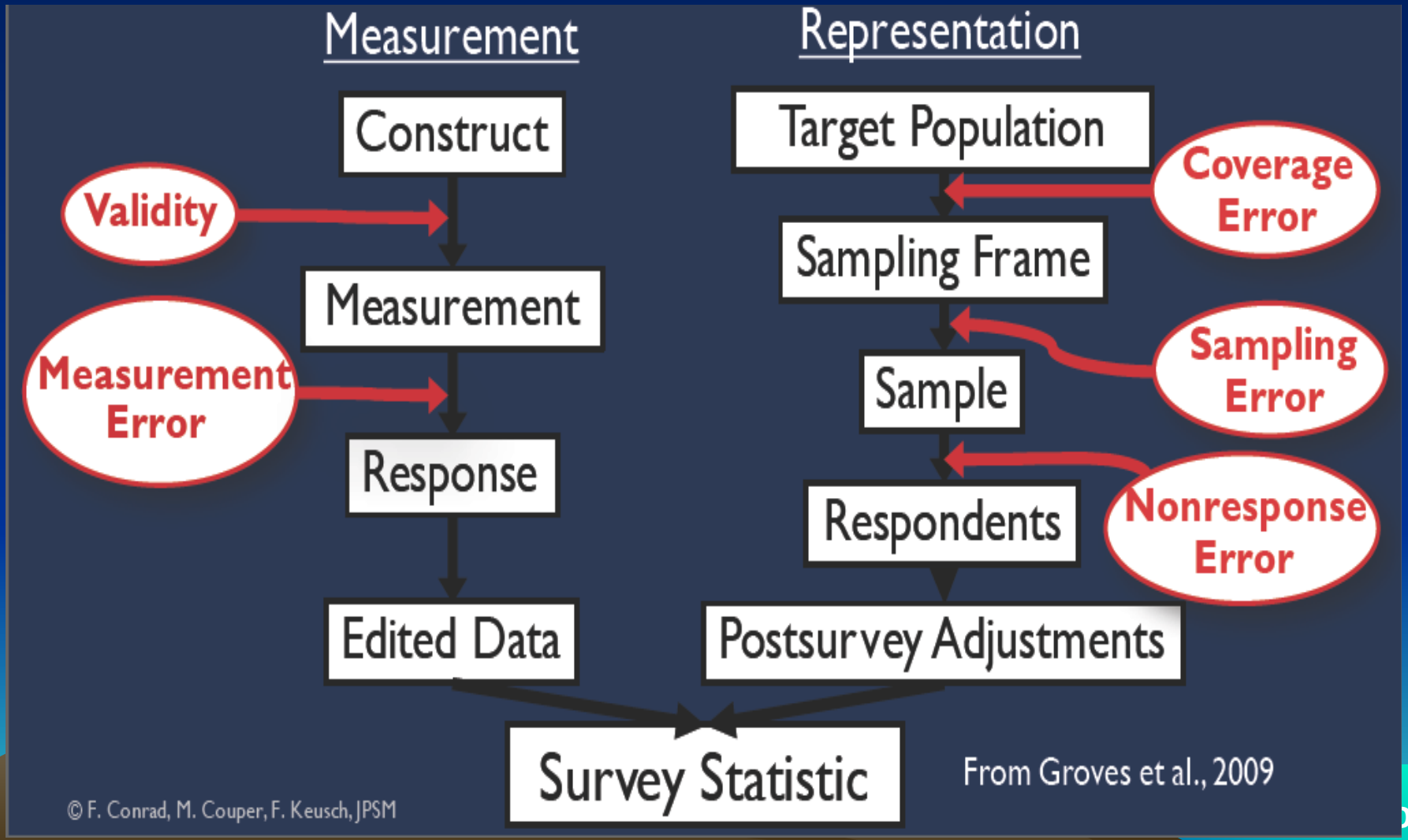
Survey Lifecyle from a Process Perspective



Total Survey Error (TSE) Framework



Group exercise 7
Day 3-M

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Total Survey Error

Errors of Nonobservation
- Coverage
- Sampling
- Nonresponse

Errors of Observation
- Questionnaire, Mode
- Interviewer
- Respondent

Errors of Processing
- Editing
- Coding
- Imputation

Section 7

Group work

- Unstructured Interview
- Semi-structured interview
  - Content analysis
    - Similarity
    - Pattern

Questionnaire Development

Variable and Scale

- Nominal
  - The categories/values of variables differ one from the other in name only
- Ordinal
  - There is an ordered relationship among the categories or values in a variable.
- Numerical
  - The categories are ordered by the amount of a property they have

Example-Numerical

- How much are you paid in US$?

  300

- How old are you?

  33

Examples-Ordinal

- **Education…..**

Pri	Sec	Hig	Gra
1	2	3	4

- **How do you think about the course?**

Bad	Very-bad	Worst
1 2	3	
-1	0	+1

Examples-Nominal

- Sex ……

male	female
1	0
1	2

- Are you a student?….

Yes	No
1	0
5	6

Open or Close

- **Open Question**
  - Where do you live? _ _ _ _ _ _ _ _
  - Comments _ _ _ _ _ _ _ _
  - Suggestions _ _ _ _ _ _ _ _
- **Close Question**
- Do you live in Yangon ?
  - ☐ Yes ☐ No
  - ☐ Yangon ☐ Outside Ygn

Open or Close

- **Close Question**
- How do you find the training? (single answer)
  - □ Good
  - □ Normal
  - □ Bad
- Where did you live? (multiple answers)
  - □ Yangon
  - □ Nay Pyi Taw
  - □ Mandalay
  - □ Bago

Questionnaire

- “a GOOD Question
  - one that produces answers that are reliable and valid measures of something we want to describe”

  Logical or in order

  Are you married? If no skip

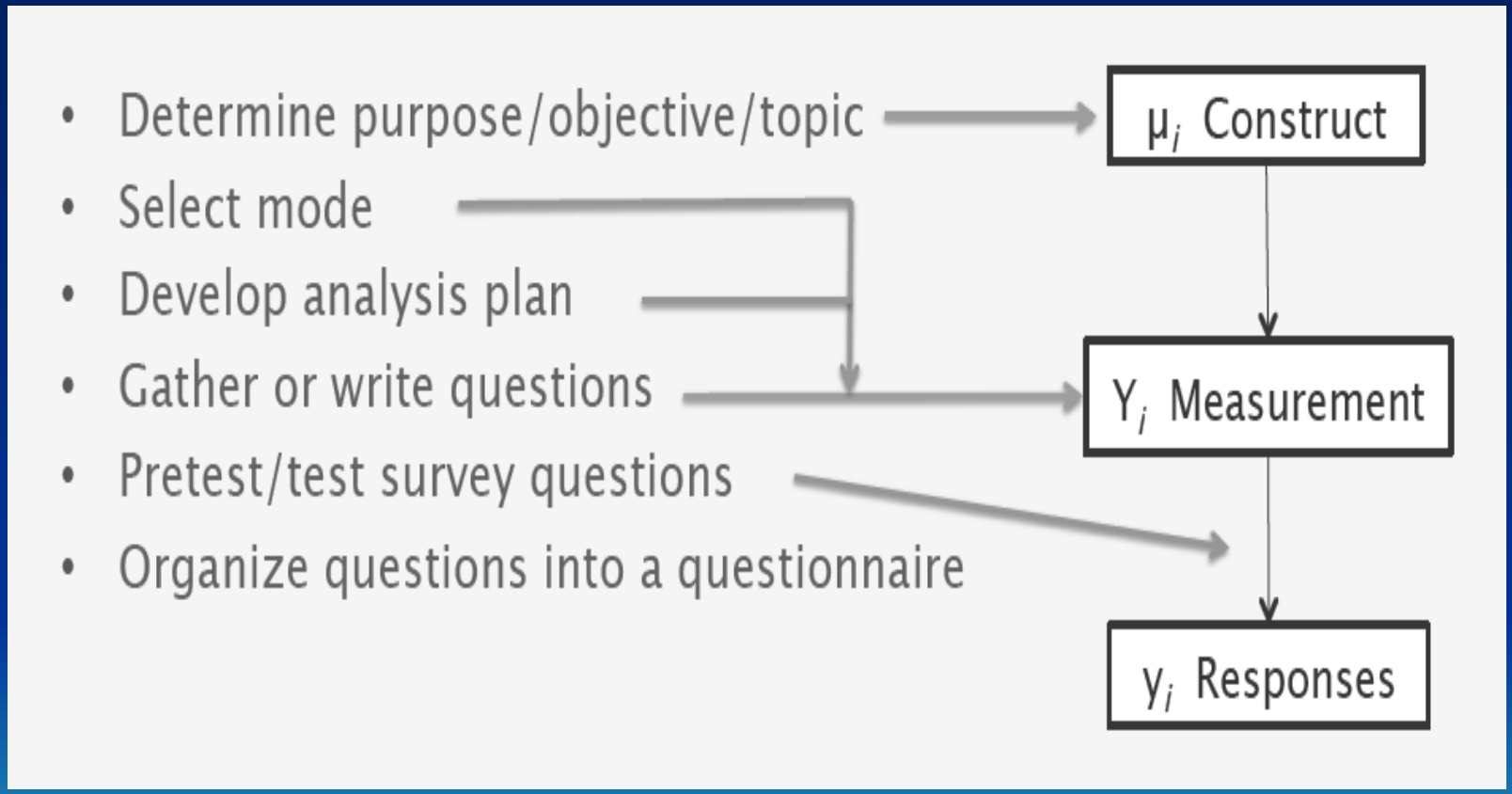
  Do you have a child?
- Question Wording
  - words that are consistent with the educational level of the intended respondents
  - any response options must be clear to both the respondent and the researcher

Questionnaire

- Feasible to answer and respondents must be willing to answer

- Biased Wording
  - Do not includes a predisposition either for or against a particular perspective answer them

Overview of Questionnaire Design Process



Group exercise 8
Day 3-A

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Section 8

Data Coding and Analyzing

How to Code

Sr. No	Sex	Age	Education	Native
1	Male	15	Educated	Yes
2	Female	15	Educated	Yes
3	Male	16	Uneducated	Yes
4	Male	17	Educated	Yes
5	Female	20	Uneducated	No
6	Male	22	Uneducated	Yes
7	Male	20	…	No
8	Female	16	Uneducated	Yes
9	Female	24	Educated	Yes
10	Male	18	Uneducated	No

How to Code

Sr. No	Sex	Age	Education	Native
1	1	15	1	1
2	0	15	1	1
3	1	16	0	1
4	1	17	1	1
5	0	20	0	0
6	1	22	0	1
7	1	20	...	0
8	0	16	0	1
9	0	24	1	1
10	1	18	0	0

Processing & analyzing Data

Analysis

- Reasoning to understand and interpret the data that have been collected
- Using Statistical Software Packages or Survey Packages (E.g. Excel, SPSS, …)
- Useful Statistics
  - Frequency Tables
  - Cross Tab Tables
  - Compare Mean
    - Independent *t* Test
    - Paired *t* Test
    - Anova (Analysis of Variances)

Group exercise
Day 3-M

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Data Analysis

Sr. No	Sex	Age	Education	Na-tive
1	1	15	1	1
2	0	15	1	1
3	1	16	0	1
4	1	17	1	1
5	0	20	0	0
6	1	22	0	1
7	1	20	…	1
8	0	16	0	0
9	0	24	1	1
10	1	18	0	0

Number =10	Male =6 persons	Total= 183	Educated=4	Native= 7
	Female=4 persons	Number=10	Uneducated=5	
		Mean =18.3		

Manually Data Calculation

- Total number =10
- Frequency of male = 6
- Frequency of female = 4
- Percentage….?
- Percentage = number/total *100

  = 6/10 * 100

  = 60%

Frequency Table

Sex

		Frequency	Per cent
Valid	0	4	40.0
	1	6	60.0
	Total	10	100.0

Education

		Frequency	Per cent	Valid Percent
Valid	0	5	50.0	55.6
	1	4	40.0	44.4
	Total	9	90.0	100.0
Missing	System	1	10.0	
Total		10	100.0	

Descriptive Statistics

	N	Minimum	Maximum	Sum	Mean	Std. Deviation
Age	10	15	24	183	18.30	3.093
Valid N (listwise)	10					

Sex * Education Crosstabulation

		Education		Total
		Uneducated	Educated	
Sex	Female	2	2	4
	Male	3	2	5
Total		5	4	9

Group exercise
Day 4

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Section 9

Research Ethics

- Research participants must voluntarily consent to research participation.
- Research must avoid unnecessary physical and mental suffering.
-
- Research must be based on sound theory and prior animal testing.
- No research projects can go forward where serious injury and/or death are potential outcomes.

- Experiments can be conducted only by scientifically qualified persons.
- Human subjects must be allowed to discontinue their participation at any time.
- Research aims should contribute to the good of society as well as to the community respondents or individual respondents.

Today's Ethics

- Autonomy
- Free and informed consent
  - Information, Voluntariness and Comprehension
- Respect for Vulnerable Persons
- Privacy and Confidentiality
- Justice and Inclusiveness
- Harms and Benefits –
  - Minimizing Harm (Non-maleficence)
  - Maximizing Benefit (Beneficence)

Ethical Considerations II: Data Collection and Human Subjects

- Respondents Should Provide Willing and Informed Consent.
- Do No Harm to Participants
- Minimize Deception
- Participants should be provided with (a) information on the purpose of the research; (b) the sponsor of the research; and (c) the approximate length of the interview.

- Protect Respondent Confidentiality
- The Issue of Refusal Conversions
- The Use of Incentives