V6 - Sampling Distribution Theory Part I

Course: Statistical Testing & Regression
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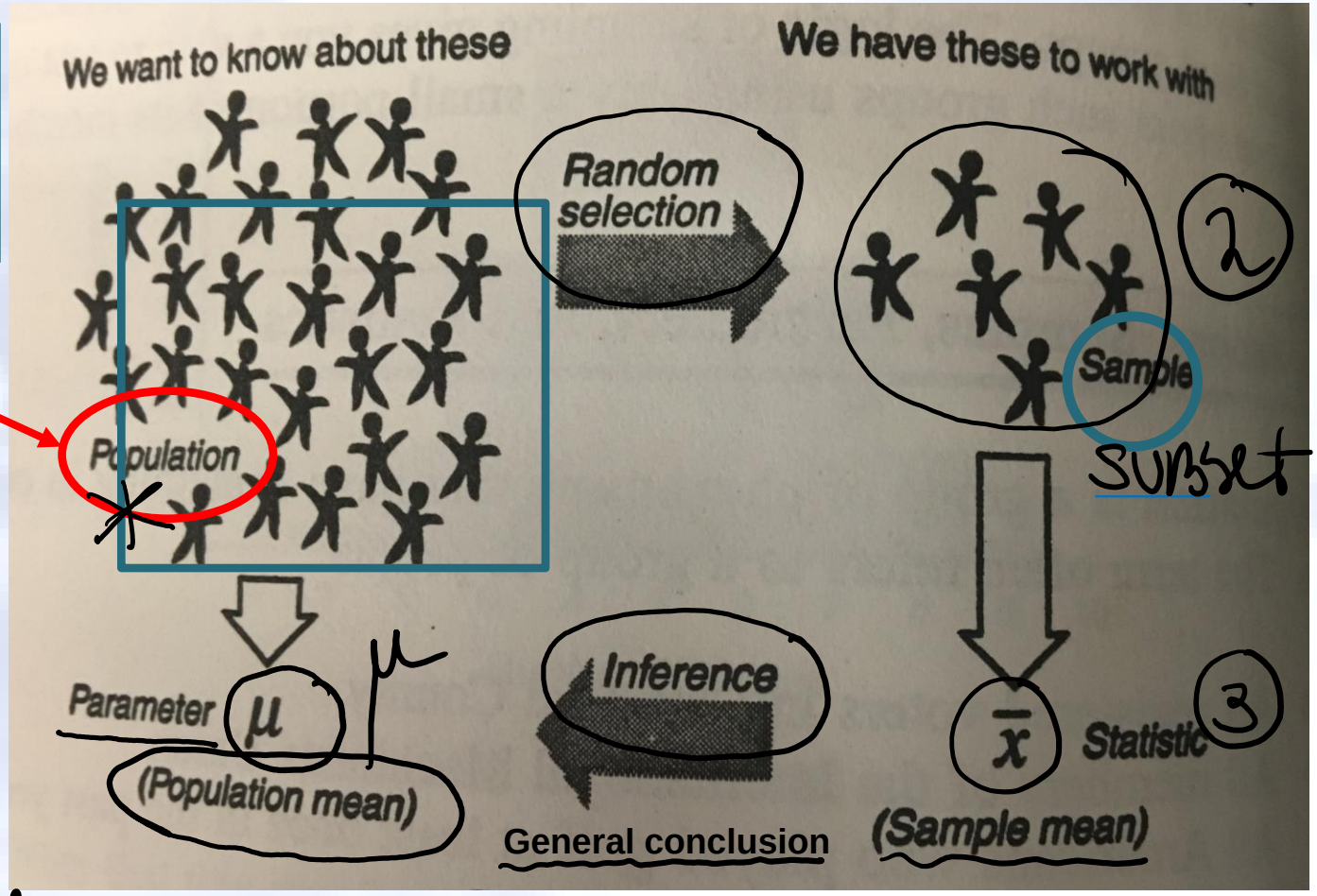
Sampling Distribution Theory – Part I

- Process of statistical inference
- Simple random sampling
- Stratified random sampling
- Biased sample

Process of Statistical Inference

1. All observations of interest.

All may not be known or identifiable



pop → sample → $\bar{x}$ → μ → $\bar{x}$ μ

Statistical Inference

Relies on appropriate sampling from the population.

2 types of sampling

- Simple
- Stratified

Simple Random Sampling (SRS)

- Best for small populations
  - when each item can be identified
- Example of: All IE majors in Swanson School at Pitt

- Each item has **equal probability** of being selected
- Selections made *randomly* & independently
- Sample representative of population

Stratified Random Sampling

- For larger, more diverse populations
- Divides population into subgroups known as Strata
- Strata based on differences in key characteristics (such as):
  - income level
  - Age group
  - gender
- Draw **simple random sample** (SRS) from each Strata
- Combine all samples
- Final sample has subjects from *every* subgroup
- Final sample diverse & representative of population
- Better estimate of variable

Biased Sample

If you must estimate average GPA at Pitt, can you sample only Swanson engineering students? NO

Why or why not? School of Nursing, A&S, Business, SCI

- **Not representative** of population of All Pitt students
- Any estimate would be limited to Swanson
- Sample does not align with your task

Acknowledgement

This material is based upon work partially supported by the National Science Foundation under Grant# 2335802. Any opinions, findings, and conclusions, or recommendations expressed in this material are those of the author(s) and do not necessarily reflect the views of the National Science Foundation.

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THE END