PSY260- RESEARCH METHODS-II

QUASI-EXPERIMENTAL RESEARCH DESIGN

WHAT IS QUASI EXPERIMENTAL DESIGN?

- The prefix “quasi” means, in essence, “sort of”, or resembling.
- The word “quasi” means as if or almost, so a quasi-experiment means almost a true experiment.
- Quasi-experimental studies take on many forms, but may best be defined as lacking key components of a true experiment.

QUASI EXPERIMENTAL DESIGN

- A **true experiment** includes:

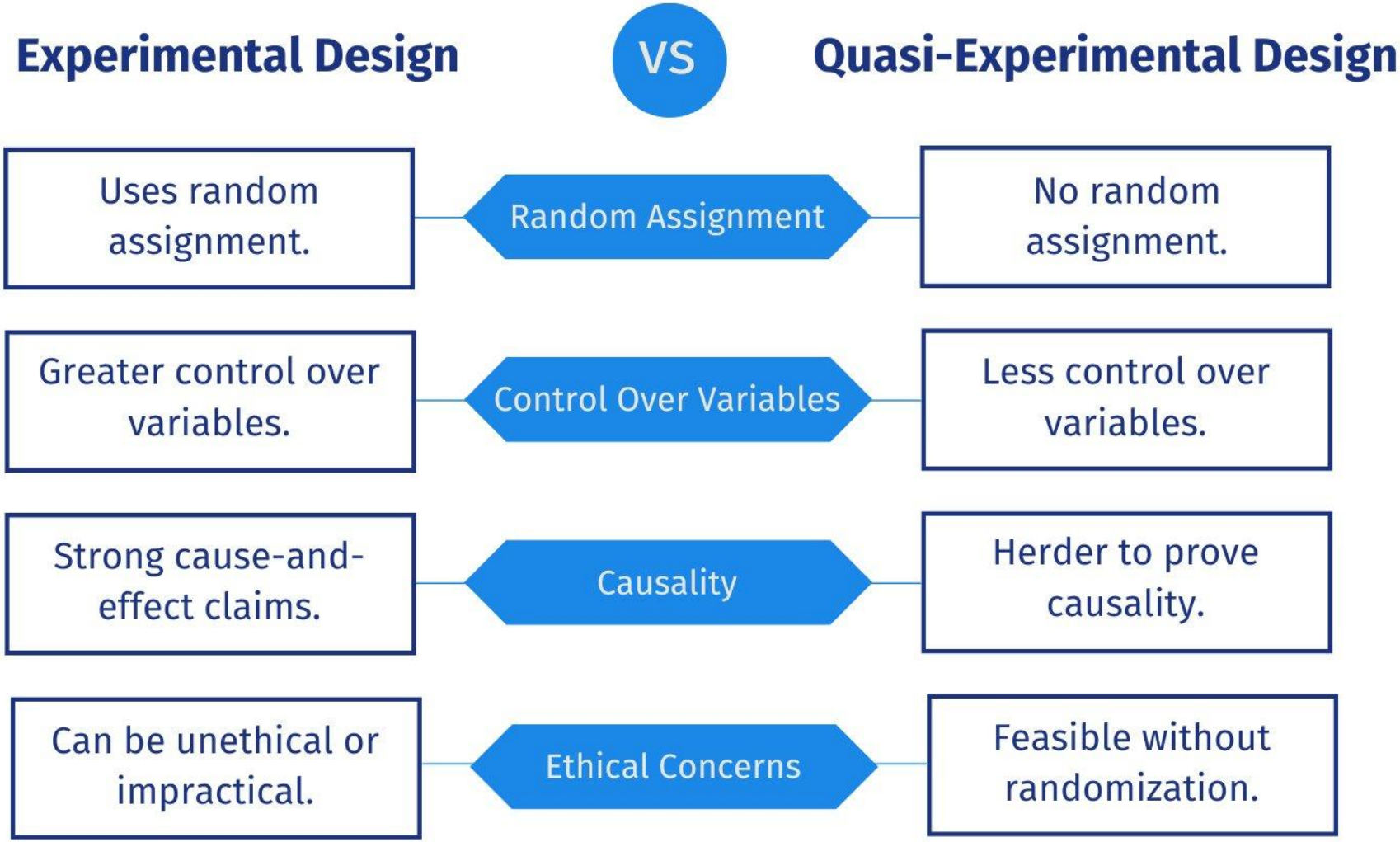
  (1) randomization

  (2) experimental group and control group

  (3) Researcher-manipulated variable

- Quasi-experiments involve the manipulation of an independent variable.
  - However, it **lacks** one or both of the essential properties: randomization and a control group.

DIFFERENCES BETWEEN EXPERIMENTAL AND QUASI-EXPERIMENTAL DESIGNS



QuestionPro

WHAT IS QUASI EXPERIMENTAL DESIGN?

- A **quasi-experimental design** examines causal relationships **without random assignment** of participants to experimental and control groups.

- It is often used when true experimental designs are impractical or unethical, making it a **middle ground between observational studies and true experiments**.

QUASI EXPERIMENTAL DESIGN

1. **No random assignment:** Groups are naturally occurring or assigned based on external factors.
2. **Pre-existing groups:** Participants may be grouped based on characteristics like location, job role, or school.
3. **Use of pre-tests and post-tests:** Many quasi-experimental studies measure outcomes before and after an intervention.
4. **Less control over confounding variables:** Since participants are not randomly assigned, other factors may influence the results.

TYPES OF QUASI-EXPERIMENTAL DESIGN

1. Non-equivalent Control Group Design
2. Time Series Design
3. Multiple Time Series Design

Quasi-Experimental Design
Non-Equivalent Control Group Design

- Includes both an experimental and a control group, but these groups are **not randomly assigned.**
- In other words, there is **an experimental and a control group**, but they are **not randomly formed.**
- **Pre-test and post-test measurements can be applied**, meaning data is collected **before and after** the intervention.
- Groups may **not be equivalent at the beginning,** which **poses a threat to internal validity.**

Quasi-Experimental Designs

NON-EQUIVALENT CONTROL GROUP DESIGNS:

1. Non equivalent control group pre-test post-test design

O1	X	O2
O1	-	O2

2. Non-equivalent control group post test only design

X	O2
-	O2

X= treatment or intervention
O1= pre-test
O2= post-test

Quasi-Experimental Design
Time Series Design

- Repeated measurements are taken over time (e.g., weekly, monthly).
- A single group or multiple groups may be used.
- **Intervention** is introduced at a specific time point, and data collection continues afterward.
- Helps identify trends, seasonality, or other time-based patterns.
- Measures significant change…

Quasi-Experimental Design:
Types of Time Series Design

1. **Interrupted Time Series (ITS):** A group is observed for a period, **an intervention occurs**, and observations continue to see if a significant change happens.

2. **Multiple Time Series (MTS):** Similar to ITS, **but includes a control group** that does not receive the intervention.

Differences - Interrupted Time Series (ITS) & Multiple Time Series (MTS) Designs

Feature	Interrupted Time Series (ITS)	Multiple Time Series (MTS)
Number of Groups	Single group (one intervention group)	Two or more groups (intervention & control)
Purpose	Examines the effect of an intervention over time	Compares trends between an intervention group and a control group
Control Group?	No formal control group	Has a comparison/control group that does not receive the intervention
Example	Tracking crime rates before and after a new policing strategy in one city	Comparing crime rates in a city with the new policing strategy to a city without it
Advantage	Shows long-term effects of an intervention	Increases validity by controlling for external factors that may influence results

Class Activity

Activity-1: "School Lunch Program Study"
«A new healthy lunch program is introduced in **School A**, while **School B** continues with its regular lunch menu. Researchers measure students' energy levels and academic performance before and after the program.»

Questions: What could be the **potential confounding variables** in study?

- How could you improve the study design?

Class Activity

Activity-2: "Social Media and Sleep Patterns"
«A group of students records their **average sleep hours per night** for one month. Then, they stop using social media **one hour before bedtime** and track their sleep for another month.»

Questions: Please try to **predict the results and** discuss potential confoundings. - What could be the **potential confounding variables** in study?

- Please, suggest potential ways to strengthen the study.

Class Activity

Activity-3: "Banning Plastic Bags in Two Cities"
«City A bans plastic bags in supermarkets, while City B does not. Researchers track plastic waste levels in both cities over six months before and after the ban.»

Questions: What could be the **potential confounding variables** in study?

- How could you improve the study design?

Validity in Quasi-Experimental Research

- **External validity** - the results of study can be **generalized** or **applied to other members of the larger population** being studied.
- **Internal Validity- the validity** of the findings within the research study.

- However, potential problems that can affect **internal validity** are;

Potential Problems May Affect Internal Validity

1. **Selection Bias**: Participants in different groups may differ systematically in ways that affect the outcome. Without random assignment, it's difficult to ensure that groups are equivalent at the start of the study, which could influence the results.

2. **Maturation**: Changes in participants over time (such as natural development or aging) may influence the outcome, independent of the experimental manipulation.

3. **History**: External events occurring during the study (e.g., a major news event, economic shift, or natural disaster) can influence participants' behaviors or outcomes, which may be mistakenly attributed to the intervention.

4. **Instrumentation**: Changes in measurement tools or procedures during the study (e.g., changes in how data is collected or coded) can affect the results.

5. **Testing Effects**: Repeated testing or exposure to the same measures may influence participants' responses, particularly in pretest-posttest designs.

6. **Social Desirability**: Participants may alter their responses or behaviors to fit what they believe is socially acceptable or expected, particularly in studies involving self-report data

Advantages

- Quasi-experiments allow researchers to study **real-world settings** where randomization is impossible or unethical.
- More suitable for real-world natural setting than true experimental research designs.
- External validity…
- It reduces the difficulty and ethical concerns that may surround the pre-selection and random assignment of test subjects.
- Can **suggest causal links** if they include strong controls, pre/post measurements, and comparison groups.
  - **Interrupted Time Series Design** can show trends **before and after an intervention**, helping rule out random fluctuations.

Disadvantages

- **Lack of randomization-** the absence of a control group or makes the results **less reliable** and weak for the establishment of casual relationship between independent and dependent variables.
- **Selection Bias**

  - In a study on **the effects of an exercise program**, those who voluntarily sign up may already be more **health-conscious**, leading to biased results.
- Pre-existing factors and other influences are not taken into account because variables are less controlled in quasi-experimental research.

So…

- Quasi-experimental research **bridges the gap** between true experiments and observational studies, but its **lack of randomization** makes it vulnerable to biases and confounding variables.
  - Researcher must **carefully design their studies** and **use statistical techniques** to improve reliability and validity.
- On the other hand, quasi-experimental research is a powerful tool when **randomized experiments are not possible!!**
- While it has some limitations, strong designs can still provide **valuable insights** such as psychology and education studies.

Any questions??