RESEARCH CORE SCIENCE

SCHOOL YEAR 2021-2022

QUANTITATIVE APPROACHES TO RESEARCH

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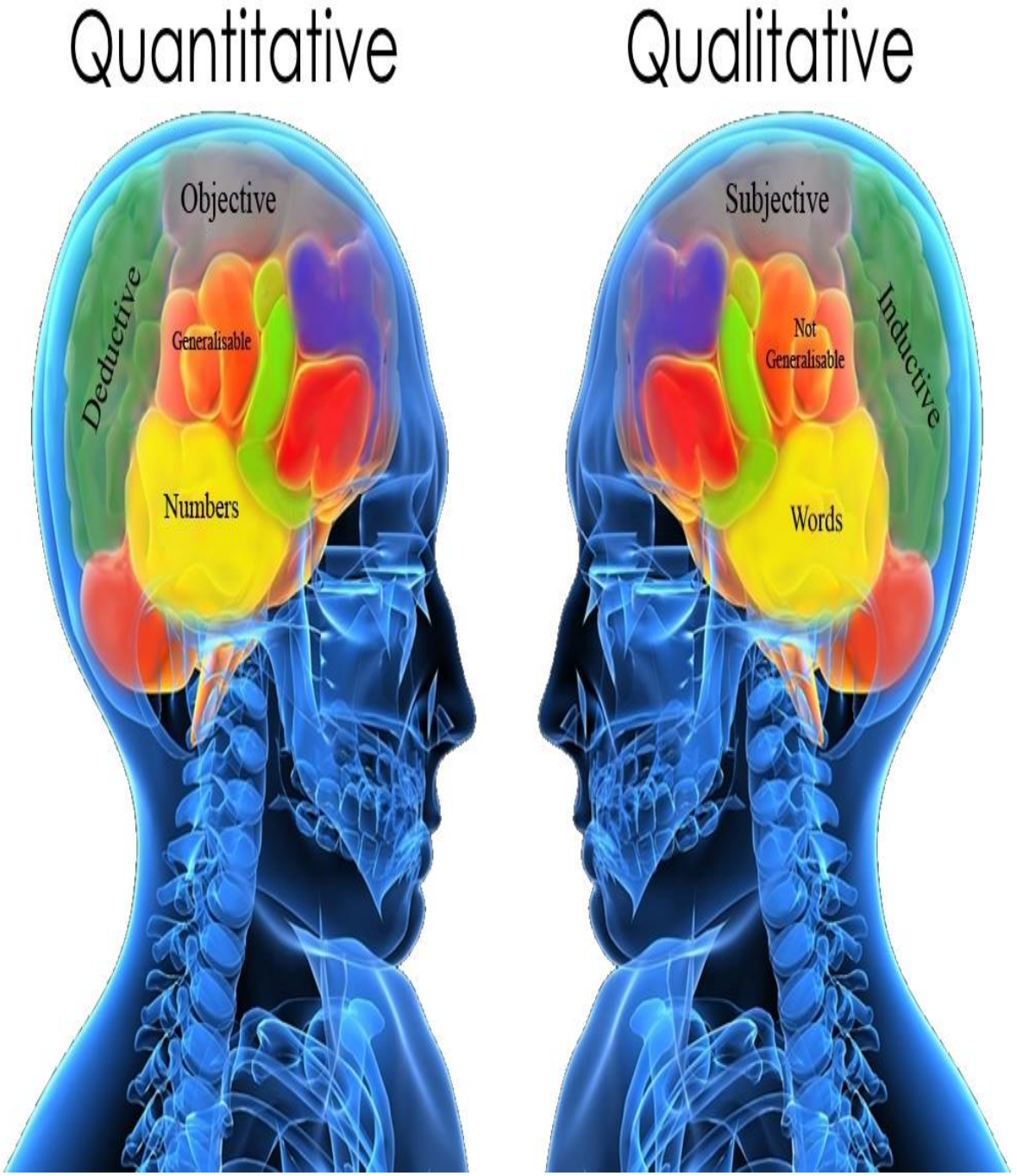
RESEARCH DESIGN

- The design of your research procedures encompasses your overall approach to research as well as the specific components of how will be carried out.
- There is a wide range of approaches to research design, in there are many key factors to consider when choosing an overall approach for your project.

QUANTITATIVE VS. QUALITATIVE

- **Quantitative analysis** involves using statistical tools to analyze large amounts of numerical data on many cases.
- **Quantitative design** tends to produce data is useful for quantitative analysis.
- **Qualitative analysis** template looks at a small number of cases more in depth, using data that can always be reduced to numbers.
- **Qualitative design** tends to produce data useful for qualitative analysis.



QUANTITATIVE APPROACH TO RESEARCH

- Quantitative approaches include experimental designs; observational designs, such as cross-sectional and longitudinal studies; and large scale survey research.
- Experimental Designs- proper, uncontrolled experiments, with random assignments, controls, and treatments–allowing you to be very precise about your connections between your variables.
- They do all kinds of things that other designs don't; you can't control how parables are manipulated for your subjects, letting you really isolate the impact of variables that you think matter. The researcher has a loss of control over how the data is collected.

EXPERIMENTS WITHIN EXPERIMENTAL DESIGN

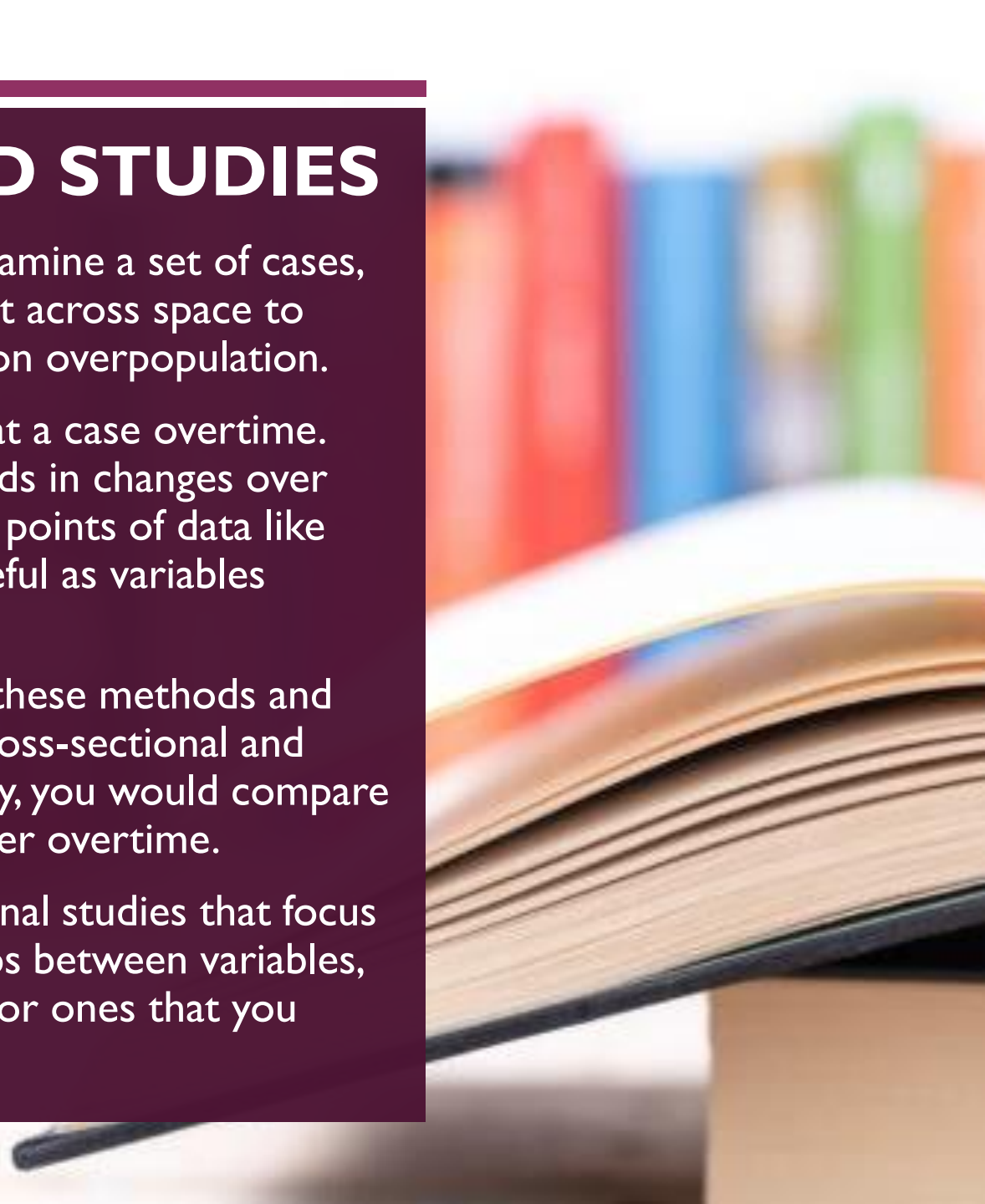
- Experiments are widely used in the natural sciences and psychology, and the principles of experimental design can be applied to survey and other kinds of studies.
- Because of this, if you can't answer your research question using a proper experiment, you probably should.

OBSERVATIONAL APPROACHES

- Plenty of questions and projects do not lend themselves to experimenting, so you might need to pick another method, such as a cross-sectional or longitudinal study.
- With these observational designs, you can't control your subject the same way you can with experiments.
- Instead of manipulating variables and seeing what happens, you have to simply observe the world as it is and figure out what you can do about how it works.
- The typical approach is to take a large data set with information on a host of variables and conduct statistical analysis to look correlation or causation.

METHODS AND STUDIES

- Cross sectional studies examine a set of cases, as if you were making a cut across space to look at a wide cross-section overpopulation.
- Longitudinal studies look at a case overtime. They've figured study trends in changes over time by gathering multiple points of data like this can be particularly useful as variables change in value.
- You can combine both of these methods and do a design that is both cross-sectional and longitudinal. In such a study, you would compare different units to each other overtime.
- You can also do correlational studies that focus on looking for relationships between variables, often in existing data sets or ones that you build.



RESEARCH SURVEYS AND EXPERIMENTATION

- Large scale survey research is actually a type of cross-sectional design, but it is important enough in its own right to be discussed separately, as surveys are a commonly used tool and research.
- In the survey research, you distribute questionnaires to large numbers of people to determine their characteristics, behaviors, attitudes, values, or beliefs.
- Rather than experimenting on people and observing the results, you are letting people self-report and then examining what they say.
- You might also compare groups across demographic indicators, which is why many surveys ask about respondents age, gender, race, income, and educational level.

THANK YOU!
QUESTIONS AND COMMENTS

NEXT WEEK: QUALITATIVE APPROACHES TO RESEARCH