



Week 13 Lecture - Quasi-experiments & Small-n Designs

Undergraduate Research Methods in Psychology

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1 Chapter Overview


1.1 Chapter Overview

- For practical and _____ reasons, we may find our hypotheses to be difficult to investigate causal relationships with experiments and large-scale studies
 - Some of you have likely found this to be the case with your research proposals!
- But, we may still want to establish _____ validity in our relationships and/or still present results among small groups of individuals
 - Because, the allure of a good causal effect is cool!
- In this scenario we will fall back on other methods, which we call _____ - experimental and small-n designs
 - You can think of these as the _____ designs for when we have especially limited resources or difficulty in manipulating a variable

2 Quasi-Experiments

2.1 Quasi-experimental Variables

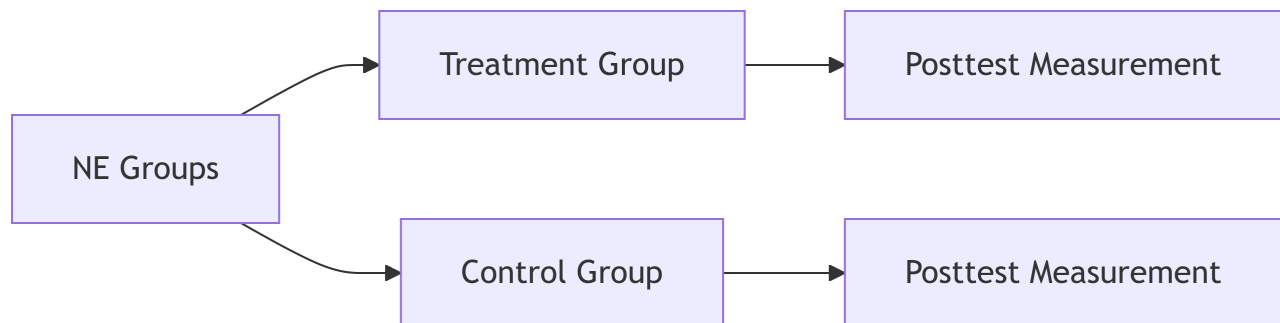
- Unlike with _____ experiments, like we've discussed so far, quasi-experiments do not have full control of the IV
 - E.g., assignment to different classrooms or different school programs by administrators, not researchers
 - These scenarios involve some sort of "conditions" but those conditions are not decided by _____ assignment, like we would have in experiments
- Because we lack control, it is better to refer to these as quasi-_____ variables.

 Discuss: Try thinking of other possible examples of times that you might run into quasi-experimental variables


2.2 Types

2.2.1 Non-equivalent Control Group Posttest-only Design

- Similar to our previous _____ groups posttest-only design, this design will have two or more comparison group, both measured on an outcome
 - In practice, these will often be analyzed with the same _____ tests, and look very similar in structure
- However, they are still only tested _____ the “intervention” occurs, not before

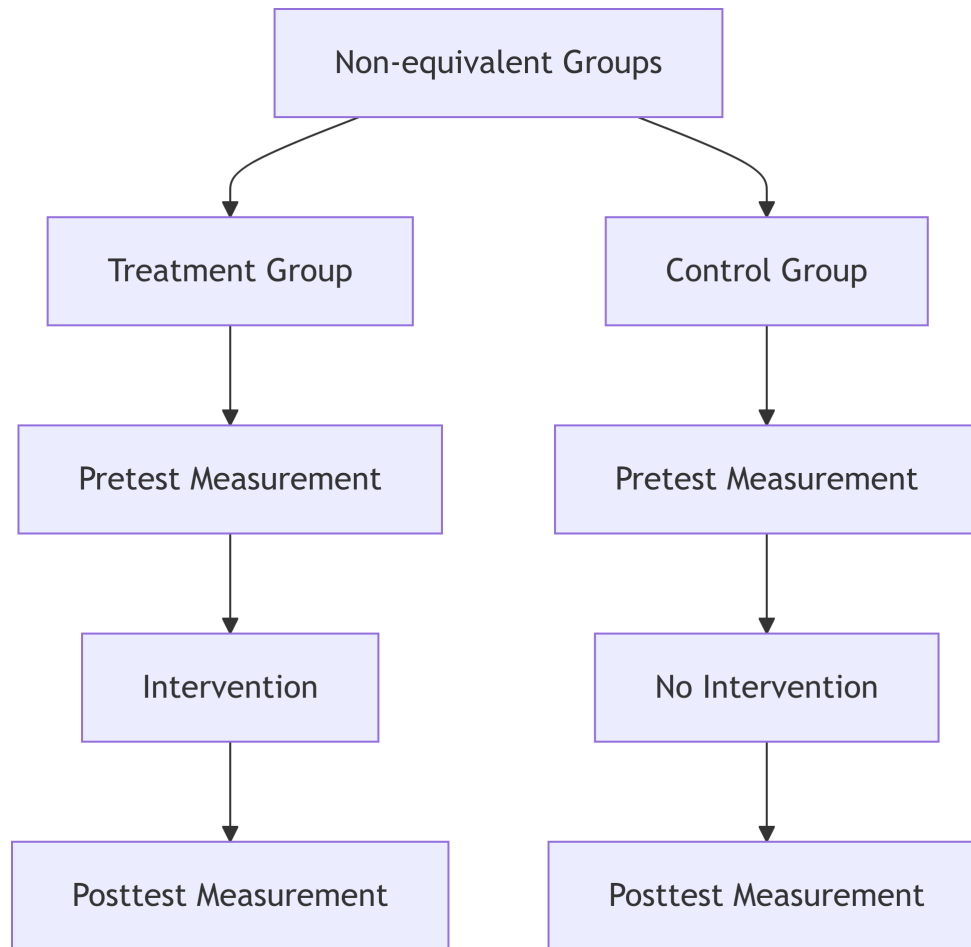


- In the “Quasi” version, the researchers _____ have the ability to randomly assign who goes in the experimental or control groups
- *Example:* Researchers look at folks treated with two different medications for high blood pressure after admission to the hospital, in a retrospective study.

 Discuss: Where does the non-equivalent part of the design name come from; what makes the normal experimental posttest equivalent groups?

2.2.2 Non-equivalent Control Group Pretest/Posttest Design

- Largely an _____ of above, this follow the same procedures as the previous design, but now includes measurements before and after the intervention.



- *Example:* The same medical researchers from the previous example now compare blood pressures at outpatient visits prior to admission, and then changes in blood pressure after treatment with two different medication during admission

? What previous true experimental design is this an analog to?

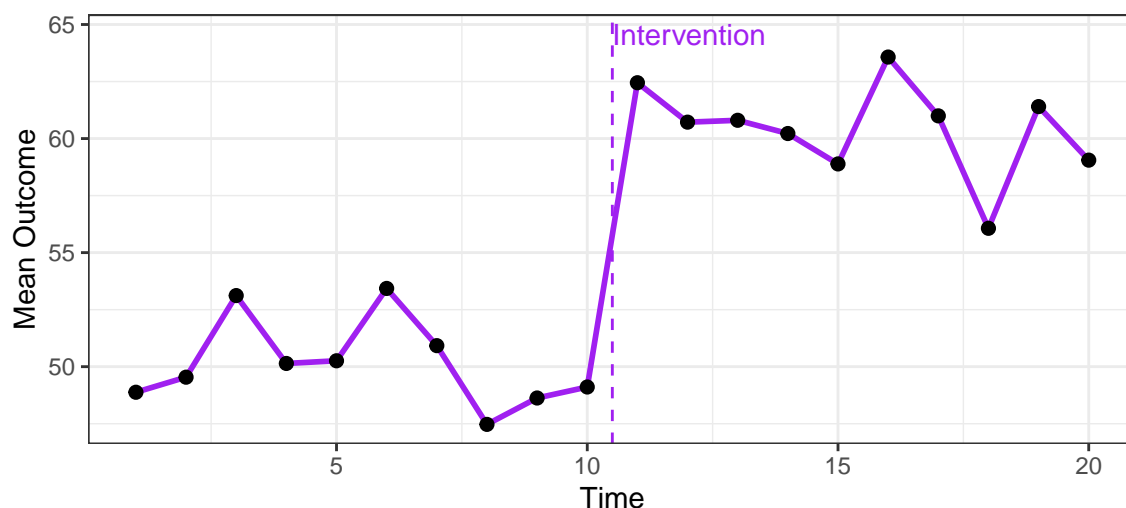
- A) Pretest/Posttest
- B) Longitudinal
- C) Multiple Regression
- D) Mixed Factorial

Explanation:

2.2.3 Interrupted Time-series Design

- This is when we are _____ some variable for a period of time, and then it's measurement is "interrupted" by some clear event
 - We can then compare folks on the _____ and after of the measured variable after the event
- This type of design can appear to be remarkably similar to a _____ multivariate correlational design - but with the added confound of some meaningful event occurring
- *Example:* I am tracking changes in optimism weekly in teenagers about the current political climate, and then a national election happens and I continue to gather weekly info

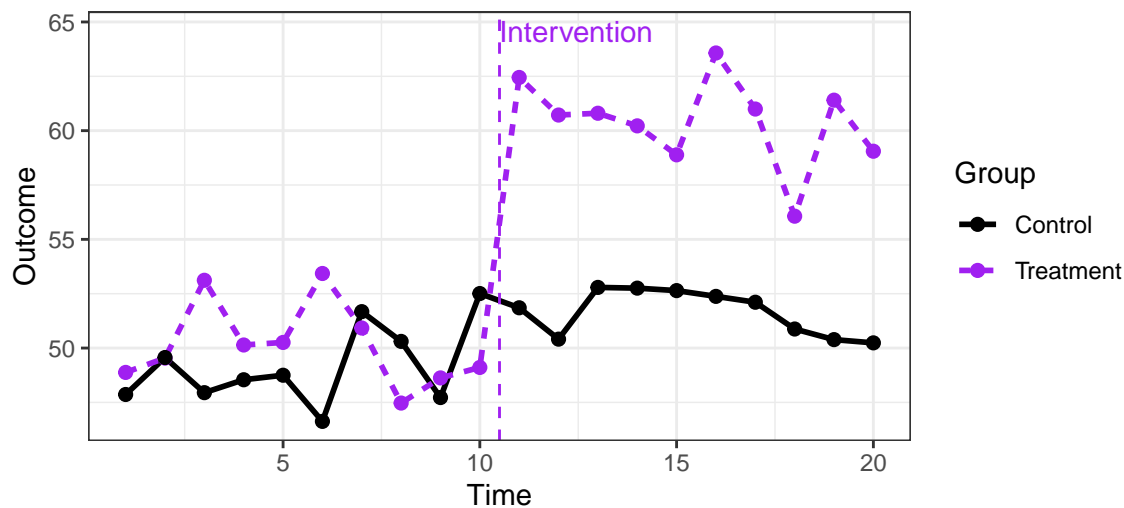
Interrupted Time-Series Design




2.2.4 Non-equivalent Control Group Interrupted Time Series Design

- A _____ of the time series and non-equivalent control group designs, where we have both comparison groups and also a historical event that interrupts some variable measured over time.
- This behaves similar to a _____ design because we place emphasis on both our separate groups (between) and how they differ from before and after the event (within)

Non-equivalent Control Group Interrupted Time-Series Design



- *Example:* Same as the last example, but now I track how men and women differ in optimism levels at multiple points before and after the election

 Discuss: Review - what part of factorial designs tends to be the most interesting (hint: it looks like a crossover between lines on a graph)

2.3 Internal Validity

- Just like with _____ experiments, these designs are similarly affected by threats to internal validity
 - Recall the *many* threats we've talked about already for _____ validity
- We can still make _____ to control for these possibilities, *but* we should be cautious on how the "quasi-" part of these studies are cause for concern
 - We don't have as much _____ as we do in true experiments!
- Thankfully, the _____ for many of these are similar to their non-quasi counterparts!

2.3.1 Selection Effects

- Recall that a selection effect occurs if there is _____ variability in one group receiving one condition of the IV.
- This can be especially _____ to account for, because of the general lack of random assignment - which is largely how we prevent these effects normally

? Which of the following was not an internal validity threat?


- A) Regression to the Mean
- B) Attrition
- C) Maturation Effects
- D) Large sample size

Explanation:

- Solution:
 - Carefully monitor and consider _____ differences between groups
 - Use a pretest/posttest design to see different _____ points and trends over time
 - More complex and difficult: _____ groups to “equalize” pre-existing differences
 - If we clearly measured the variable that is identified as a selection effect, _____ it into the study and analysis!

2.3.2 Design Confound

- Similar to above, but this is when there is some systematic variation that occurs at the _____ time as the change in condition.
 - Because we don't necessarily have solid control over the “intervention” or quasi-independent variable, it is possible there are _____ changes at the same time
- *Example:* An earthquake happens among the group that I had been measuring for happiness, but on top of this, there was severe change in economic status of the country at the same time - so where did a change come from?
- There isn't a full proof solution to this, sometimes we just may have to recognize a _____ that the change is due to a multi-faceted change

 Discuss: What part of a published article are limitations most often discussed?

2.3.3 Maturation Effects

- Like as with the “normal” maturation effects, we can account for this by observing comparison groups and using a pretest/posttest design.

2.3.4 History Effect

- First thing to consider is whether a history effect cause systematic variability in only one _____.
- Solution:
 - Still using comparison groups and pretest/posttest!

2.3.5 Regression to the Mean


- Surprise, surprise, this is still the same _____ as discussed before
- Solution:
 - Still using comparison groups and pretest/posttest!

2.3.6 Attrition

- Be mindful to check for attrition effects across _____ variables and IV conditions.

2.3.7 Testing & Instrumentation

- Largely, just ensure construct validity and use parallel forms to prevent practice effects.
-

 Discuss: Describe, in your own words, what the difference between Testing and Instrumentation threats is


2.3.8 Observer Bias, Demand Characteristics, & Placebo Effects

- Observer bias is only present if we use _____ measures
- _____ characteristics will be minimized if participants are blinded and unaware of what “condition” they are in
- Placebo _____ are only a concern when we have a comparison group receiving an inert treatment, and can be nullified with a control group.

2.4 Priorities of Validity

2.4.1 Real-world Opportunity

- Sometimes, societal change presents an interesting question for researchers, that wouldn't otherwise be possible on such a _____
- *Example:* Something like COVID had profound effects on the world, and even though we can't easily control things like lockdowns - it is still worth studying
- Also, sometimes studies become quasi-experimental by virtue of _____ changes during the study.

 Discuss: What are some other events that would spur a quasi-experimental question?

2.4.2 External Validity

- In some ways, these types of studies are more _____ and observe participants in a more natural environment, enhancing external validity.
- But still watch out for sampling _____ !

2.4.3 Ethics

- Like with [Real-world Opportunity](#), quasi-experiments may be done on naturally occurring groups that wouldn't be ethical to _____.
- *Example:* Those who suffer an adverse reaction to a common treatment vs those who do not

? Review - Which of the follow was one of the ethical principals present in the Belmont Report?

- A) Ethical Review
- B) Justice
- C) IRBs
- D) Debriefing

Explanation:

2.4.4 Construct and Statistical Validity

- Just like with previous studies, our construct validity is an analysis of how well our _____ variables are captured in the study
- Statistical validity is:
 - _____
 - Magnitude (effect size)
 - Precision (confidence intervals)

2.5 With Correlational Studies

- The primary _____ between the correlational and quasi-experimental studies is intentions and events
- Quasi-experiments usually are looking at a specified _____ events or external events, whereas correlational studies deal more with >just casting a wider net and measuring internal naturally occurring >phenomena.
- Importantly, some studies may be okay to describe _____ ways

2.6 Quasi-independent vs. Participant Variables

- Quasi-independent _____ are primarily those that change over a large portion of society or people
- Participant Variable are internal, _____ characteristics, such as age, gender, race, diagnosis, etc.
- Quasi-experiments do not result from differences in participant variables, that is saved more for correlational designs that we already discussed.

3 Small-n

3.1 Overview

- Small-n designs are unique in their extremely small sample _____. Sometimes, it is just one person!

? What do you guess is a common name for a intense study done on one person?


- A) Independent Study
- B) Intensive Study
- C) Case Study
- D) Briefer

Explanation:

- This is often due to our group of interest being naturally small, or an extreme time to each participant.
- The of small-n studies are often more concerned on individualized impact, which is a departure from the traditional probabilistic goals of most quantitative research.

3.2 Core Characteristics

- Each person is treated as an individual, rather than with others.
- Data is not (i.e., turned into a mean or median)
 - No other statistics like standard deviation either!

 Discuss: Review - If we can't do descriptive statistics, we can't do inferential either, why is that?

- Designs are used to closely monitor timing and to interventions.
- Often used in therapeutic or care settings

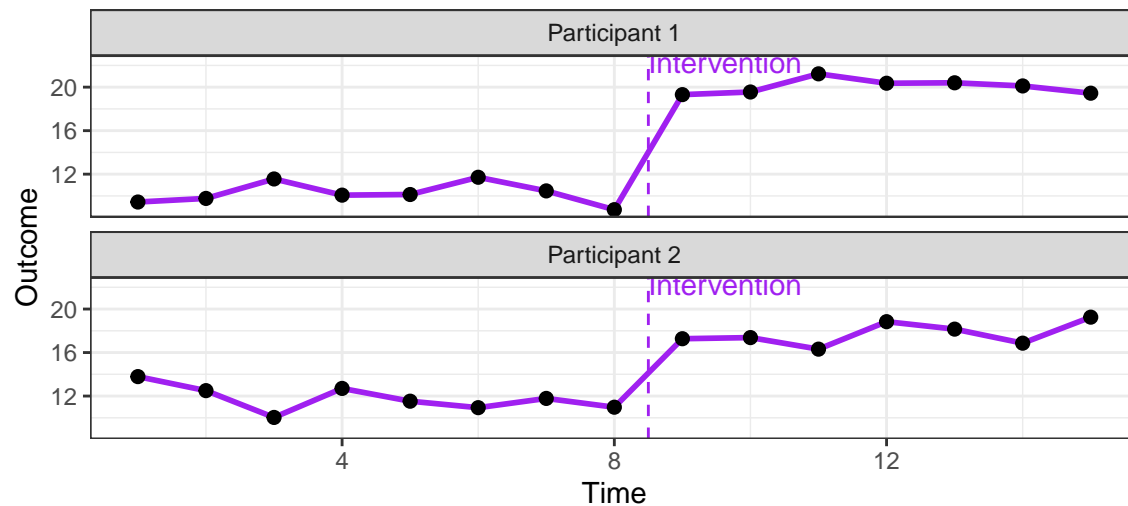
3.3 Types

- Small-n designs all share a relatively small sample size, but have different .

3.3.1 Stable-baseline

- This is when a person or few people are held at a for sufficient time to observe an unchanging status on some outcome variable.
 - This baseline period is then followed-up with some or change, and more measurements
-

Stable-Baseline Small-n Design (2 Participants)

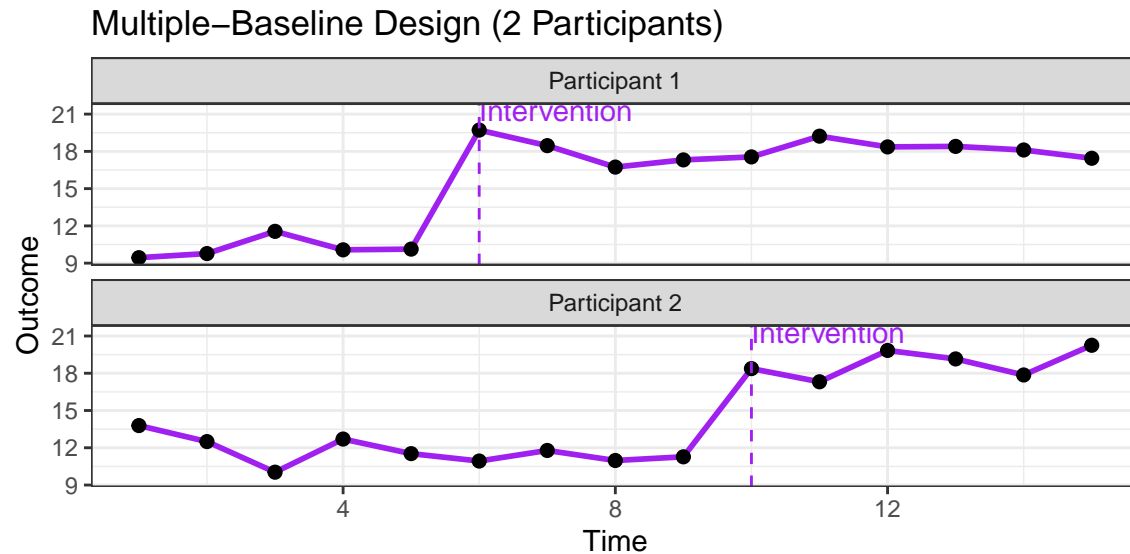



- Visually, this is almost as if you did a pre-test/post-test _____, but with just one person!

Example: I monitor a person's depressive symptoms for several months, and then start a new medication and see change afterward

3.3.2 Multiple-baseline Design

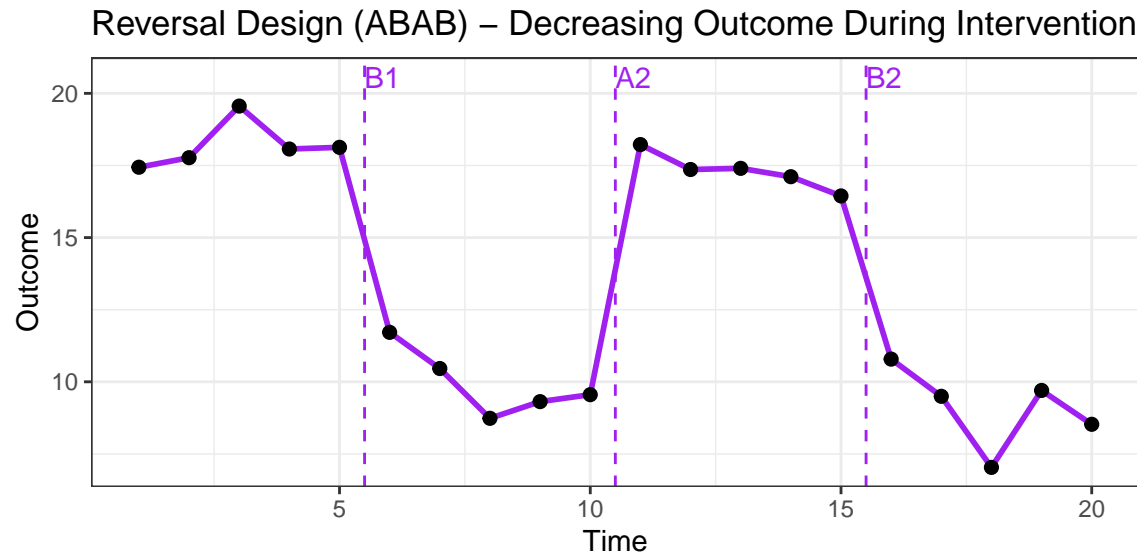
- This design requires _____ people, and necessitates staggering the timing of the intervention across the participants, to see if the timing alone is explanatory in the change.
- It also helps in observing whether multiple participants see the same _____ of behavior change, regardless of timing



 Discuss: If we have multiple (albeit few) people, why not switch to one of the other experiment types we've talked about?

3.3.3 Reversal Design

- This is when a naturally undesirable _____ is allowed to occur at baseline, and then a therapy is applied to reduce it.
- Then, after sometime, the treatment is removed, and the _____ of the behavior is analyzed.



3.3.4 Single-n


- This is a general category term that captures any study that looks at only one person over usually a _____ period of time.
 - It is common that multiple measurements and interventions for this person may be gathered _____ the study.

3.4 Balancing Priorities in Small-n

- These studies are naturally very limited in their ability to _____ to other situations and people, due to the uniqueness of the person under study.
- However, they tend to be useful in examining and describing _____ or unique cases that cannot be replicated - and some implication may inform directions in future research.

3.5 Disadvantages of Small-n

- Without comparison groups, we often open ourselves up to numerous internal validity _____.
 - E.g., _____ threats, regression threats, etc.
- External validity will tend to be naturally _____ as the cases are so specific to individual tendencies.
 - A single person can hardly be considered _____ of many people!

 Discuss: In the case of a single person being studied, what separates this research from personal experience?

3.6 Assessing Validity in Small-n

- Internal validity can be reasonably _____, especially in the case of multiple baseline and reversal designs!
 - Like with any design, the central question to internal validity is whether there was _____ for possible confounds.
- External validity is relatively weak, but may be _____ more with further, larger studies.
 - And not all _____ need to generalize!
 - E.g., a clinician working with only a few clients with a specific problem
- Construct validity is assessed just like any study - with the use of _____ bias tools and observations.
 - I.e., look at the _____ statistics for tools, as well as authors' explanations and rationale
- Statistical validity tends to often be more so graphical than truly statistical (because most _____ statistics require large groups).
 - E.g., our trusty friend, _____ plots!