Daily Assessment format

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Report

statistical conclusion validity is the degree to which conclusions about the relationship among variables based on the data are correct or "reasonable". This began being solely about whether the statistical conclusion about the relationship of the variables was correct, but now there is a movement towards moving to "reasonable" conclusions that use: quantitative, statistical, & qualitative data. Fundamentally, two types of errors can occur: type I (finding a difference or correlation when none exists) & type II (finding no difference or correlation when one exists). statistical conclusion validity concerns the qualities of the study that make these types of errors more likely. statistical conclusion validity involves ensuring the use of adequate sampling procedures, appropriate statistical tests, & reliable measurement procedures.

Low statistical power.

power is the probability of correctly rejecting the null hypothesis when it is false (inverse of the type II error rate). experiments with low power have a higher probability of incorrectly accepting the null hypothesis. i.e committing a type II error & concluding that there is no effect when there actually is (i.e there is a real covariation btw the cause & effect). low power occurs when the sample size of the study is too small given other factors (small effect size, large group variability

unreliable measures, etc)

violated assumptions of the test statistics

Most statistical tests (particularly inferences about statistics) involve assumptions about the data that make the analysis suitable for testing a hypothesis. violating the assumptions of statistical tests can lead to incorrect inferences about the cause-effect relationship. the robustness of a Test indicates how sensitive it is to violations. violations of assumptions may make tests more or less likely to make type I or II errors.

Dredging & the error rate problems

each hypothesis test involves a set risk of a type I error (the alpha rate). if a researcher searches or "dredges" through their data, testing many different hypotheses to find a significant effect, they are inflating their type I error rate. the more the researcher repeatedly tests the data, the higher the chance of observing a type I error & making an incorrect inference about the existence of a relationship.

Unreliability of measures

If the dependent and/or independent variables are not measured reliably (i.e with large amounts of measurement error), incorrect conclusions can be drawn.