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# Statistical Validity

Statistical validity refers to whether a statistical study is able to draw conclusions that are in agreement with statistical and scientific laws. This means if a conclusion is drawn from a given data set after experimentation, it is said to be scientifically valid if the conclusion drawn from the experiment is scientific and relies on mathematical and statistical laws.

There are different kinds of statistical validities [1] that are relevant to research and experimentation. Each of these is important in order for the experiment to give accurate predictions [2] and draw valid conclusions. Some of these are:

- Construct Validity [3]: Construct validity is a type of statistical validity that ensures that the actual experimentation and data collection conforms to the theory that is being studied. A questionnaire regarding public opinion must reflect construct validity to provide an accurate picture of what people really think about issues. There are essentially two types of construct validities:
    - Convergent validity [4] - this validity ensures that if the required theory predicts that one measure be correlated with the other, then the statistics confirm this.
    - Divergent or Discriminant validity [4] - this validity ensures that if the required theory predicts that one variable [5] doesn't correlate with others, then statistics need to conform this.
- Content validity [6]: This type of validity is important to make sure that the test or questionnaire that is prepared actually covers all aspects of the variable that is being studied. If the test is too narrow, then it will not predict what it claims.
- Face validity [7]: This is related to content validity and is a quick starting estimate of whether the given experiment actually mimics the claims that are being verified. In other words, face validity measures whether or not the survey has the right questions in order to answer the research questions that it aims to answer.
- Conclusion validity: this type of validity ensures that the conclusion that is being reached from the data sets obtained from the experiment are actually right and justified. For example, the sample size should be large enough to predict any meaningful relationships between the variables being studied. If not, then conclusion validity is being violated.
- Internal validity [8]: internal validity is a measure of the inherent relationship between cause and effect that are being studied in the experiment. For example, the controls used in the experiment must be meaningful and strict if the effect of one variable is being studied on another.
- External validity [9]: external validity is all about how to apply the results from this particular experiment to more general populations [10]. External validity tells us whether or not we can generalize [11] the results of this experiment to all other populations or to some populations with particular characteristics.

These are the main types of statistical validity that one needs to consider during research and

experimentation.

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**Links:**
[1] http://en.wikipedia.org/wiki/Validity_%28statistics%29, [2] https://explorable.com/prediction-in-research, [3] https://explorable.com/construct-validity, [4] https://explorable.com/convergent-validity, [5] https://explorable.com/research-variables, [6] https://explorable.com/content-validity, [7] https://explorable.com/face-validity, [8] https://explorable.com/internal-validity, [9] https://explorable.com/external-validity, [10] https://explorable.com/research-population, [11] https://explorable.com/what-is-generalization, [12] https://explorable.com/users/siddharth, [13] https://explorable.com/statistical-validity