

# Understanding Quantitative & Qualitative Analysis

A-team Session 4

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## Quantitative Analysis (Mertens, 2005)

- **Reliability** is concerned with the consistency of a set of measurements or measuring instrument. Does not imply validity. That is, something can be measured consistently, but necessarily what it is supposed to be measuring. Pilot tests of instrument
- **Internal validity** is concerned with the support that the causal variable (predictor) caused the effect in the effect (dependent) variable. Use control and experimental groups, randomly selected samples, good lit review to eliminate irrelevant variables
- **External Validity** is concerned with the support for the generalization of the results beyond the study sample. Random sample reflective of general population, correct sample size for generalization.
- **Sampling strategies**-large, random, representative, use of control groups

## Qualitative Analysis (Merriam, 1998)

- **Reliability** of findings concerned with whether it makes sense & consistent with data collected, not whether can be replicated again (use triangulation, peer examination, research audit trail)
- **External validity** concerned with how applicable to other situations \*most problematic in QUAL, can't generalize in statistical sense so focus on **reader/user generalizability** Use rich, thick descriptions of phenomenon & use of multi-site designs or cases can help reader determine how closely it fits or can be transferred
- **Sampling strategies**-research is usually collected from small, purposeful, nonrandom samples that are information rich

## Basics of Statistical Analysis (Mertens, 2005)

**Descriptive** statistics are statistics that describe or indicate several characteristics common to entire sample.

- Mean, median, mode, frequency distributions
- standard deviation: sum of deviations from the mean squared; shows spread of deviation from normal distribution

**Inferential** statistics are statistics used to determine whether sample scores differ significantly from each other. Used to compare differences between groups and involves parametric statistical techniques. **Parametric** statistical techniques used for group comparison when samples are normally distributed, randomly selected or assigned, and you are using interval or ratio measurements.

- t Test for Means – statistical test used to see whether a difference between the means of two samples is significant

**Nonparametric** statistical techniques are used when assumptions of normality cannot be met, with small sample sizes, or with ordinal (rank) or nominal (categorical) data.

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- Chi Square Test – used to analyze data reported in categories, test is interested in seeing if two or more groups differ with respect to a nominal variable (i.e. whether the relationship between gender and kind of disability statistically significant)

### Types of Measurement Scales

- **Nominal-** (categorical) Ex: gender; used to categorize or “name” object, no order implied
- **Ordinal-**(or rank ordered)-level of measurement of rank order along some dimension, Ex: SES-low, med, high, Likert rankings-how important is religion to you: very important, important, etc.
- **Interval-**(rank ordered and have equal distance between attributes) Ex: temperature or IQ
- **Ratio** (nominal, ordinal, interval and has “true zero pt.” Ex: income or age

### Ethical Issues in Qualitative & Quantitative Research (Bogdan & Biklen, 2003)

- Informed consent-understand nature & benefits of study, risks, obligations (nature of relationship with researcher)
- Participation is voluntary/right not to participate or to stop participating at any point
- Participants have right to privacy-participants identity protected, employ pseudonyms
- Data is confidential. Only accessible by participants & members of research team (unless participants give permission).
- Researcher is truthful when reporting results.
- Researcher respect the dignity of participants (especially in qual because of potentially sensitive topics of inquiry-i.e. power/privilege issues)

### References

- Bogdan, R.C. & Biklen, S.K. (2003). *Qualitative research for education: An introduction to theories and methods* (4<sup>th</sup> ed.). Boston: Allyn and Bacon.
- Merriam, S. B. (1998). *Qualitative research and case study applications in education*. Thousand Oaks, CA: Sage.
- Mertens, D. M. (2005). *Research and evaluation in education and psychology: Integrating diversity with quantitative, qualitative, and mixed methods*. (2<sup>nd</sup> ed). Thousand Oaks, CA: Sage.



