Variables: **1)** Categorical: **a)** nominal, **b)** ordinal: GPA (A, B...), Likert (SA, N, SD) **2)** Numerical: **a)** ordinal (Likert: 1, 2, 3, 4), **b)** interval (on a scale of 1 to 10 how happy are you, GRE score), **c)** ratio (age, height, time)

Skewness: **1)** Right: value>2. Mode<median<mean **2)** Left: value<2

Kurtosis: **1)** Platykurtic: looks like a mount. -. value<2, **2)** Leptokurtic: narrow. +. (value>2: normal dist)

CLT: As n grows, the (imaginary) dist of gets closer to a NL dist. Used if X is normally distributed, regardless of n; or n> 30 regardless of dist of X. ( is a better estimate of 🡪 sample represents population!)

Z-test ( is known): , , z N(0, 1) ,

One-sample t-test ( is unknown): , , t ,

Independent Samples t Test: , , ,

Paired Samples t Test: , ; {d= post-pre , n= # of pairs};

Effect size (z-score!): 1-Sample t test: ; Indep Smp t test: ; Dep Smp t test:

S: 0.2, M: 0.5, L: 0.8

Power: 1-)= p (z= > ), assuming H1 is true. Standard power in Social sciences: 0.8

ANOVA: F = Variance between groups/Variance within groups

Single Proportion: = , {If unknown, use in SE};

2 Independent Proportions: = , p= ;

Internal Validity: trust in result; External Validity: generalizability

Threats to int. val: History (an event occurs at the same time as treatment), Maturation, Testing (increasing familiarity with measure), Regression (extreme scores), Selection (differences exist between individuals in treatment and control groups at the start of the study), Mortality (differences in those who remained in each group rather than the effects of treatment), Instrumentation (change in measures)

Control group rules out history, maturation, testing, instrumentation, and regression, but not selection. But randomization does.

One-Shot Case Study: G1 X1 OA No control for maturation or history. One-Group Pretest-Posttest: G1 OA X1 OB No control for testing, instrumentation, maturation, or history. Static-Group Comparison: G1 X1 OA; G2 X2 OB No control for selection. Time-Series Design: O O O X O O No control for instrumentation or history. Nonequivalent Control Group Design: G1 OA1 X1 OB1; G2 OA2 X2 OB2 No control for selection, regression? Pretest-Posttest (Randomized) Control Group Design: R G1 OA1 X1 OB1; R G2 OA2 X2 OB2 Great! Posttest Only (Randomized) Control Group Design: R G1 X1 OA1; R G2 X2 OA2 Great! Solomon Four-Group Design: R G1 OA1 X1 OB1; R G2 OA2 X2 OB2; R G1 X1 OB3; R G2 X2 OB4 Great!

; df= (r-1)(c-1). Categorical variables; 5 expected counts/cell; Mean is df and Variance is 2df.

Covariance: ;

Pearson correlation: ; S:M:L=0.1: 0.3: 0.5; ;

2 independent samples: