Compare 2+ group means

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1. G groups $= \frac{g(g-1)}{2}$ t-tests $\frac{\bar{X}_1 - \bar{X}_2}{\sqrt{\frac{1}{n_1}+\frac{1}{n_2}}\sqrt{\frac{s_1^2(n_1-1)+s_2^2(n_2-1)}{n_1+n_2-2}}} \sim t_{n_1+n_2-2}$	t-tests make sense	α-error inflates $\alpha = 1-[(1-\alpha)]^{g(g-1)/2}$ Requires assumptions* of normality; equal variances
2. Calculate SAD (or MAD) $SAD = \lvert\bar{X}_1-\bar{X}_2\rvert + \lvert\bar{X}_1-\bar{X}_3\rvert + \lvert\bar{X}_2-\bar{X}_3\rvert$ Run randomization test	Few assumptions Easy to understand Does not inflate α-error rate	Only considers variation between groups; not within groups will result in same p-value
3. ANOVA $\frac{MS_A}{MS_E} \sim F^{g-1}_{N-g}$ $MS_A = \frac{\sum n_a(\bar{X}_a - M)^2}{a-1}$ $MS_E = \frac{\sum(x_i-\bar{X}_a)^2}{N-a} = \frac{\sum(n_a-1)s_a^2}{N-a}$	Considers both between-group and within-group variation Does not inflate α-error rate Can estimate effect size (η^2)	Requires* normality; equal variances
4. Randomized MSR • Calculate $MSR = \frac{MS_A}{MS_E}$ • Randomize treatments - Calculate MSR* - Repeat many times	Same advantages as ANOVA Requires few assumptions (no normality or equal variance assumption)	Requires computer * ANOVA is robust against violations of assumptions when sample sizes are equal.