1. *Topic Description and Objectives:*

- **CASE 1:** Sample size analysis for t-test
- ***Equal N, Medium Effect***

2. *MC2G Program Setup (verify the following input before running analysis):*

	Group 1	Group 2		Value
Population Mean =	0.5	0.0	**Number of Means to Keep =**	N/A
Population SD =	1.0	1.0	**Statistical Test =**	POOLED *t*
Group Size =	16	16	**Correlation bet. Measures =**	0.0
Distribution =	NORMAL	NORMAL	**Directionality of Hypothesis =**	TWO-TAILED
Reliability =	1.0	1.0	**Alpha Level =**	0.05
Integer Data =	UNCHECKED	UNCHECKED	**Automatically set...Seed... =**	UNCHECKED
Minimum =	N/A	N/A	**Integer Seed =**	1566
Maximum =	N/A	N/A	**Number of MC Samples =**	10000

3. *Steps Necessary to Run Analysis:*

- Here, the group sizes should be set equal at the beginning (the actual value is unimportant).
- Note that the absolute beginning sample sizes per group is unimportant. What is important are their relative sizes. That is, if sample sizes are equal when the analysis begins, they will be equal after the sample size analysis is complete.
- However, if the sample sizes are unequal at the beginning, the final sample sizes results will have roughly the same ratio as the had at the start. For example, if one group has twice as many cases at the beginning, the final results will suggest sample sizes where that group requires roughly twice as many cases.
- Choose an appropriate "Get N for Power = 0.70" option under the Analysis Menu. Alternatively, use the "Get N for any Power" option.

4. *MC2G Program Output (based on Input Above):*

# Rejections =	1408	**Actual Mean Grp 1 Means =**	0.4991
Actual ALPHA / POWER =	0.7040	**Actual Mean Grp 2 Means =**	-0.0031
Desired =	0.7000	**Actual SE of Grp 1 Means =**	0.1414
		Actual SE of Grp 2 Means =	0.1397

5. *Key Points to Interpret from the Monte Carlo Results:*

- Based on the Monte Carlo analyses performed with the information provided, 50 cases are needed in each group (highlighted in yellow on the results screen)
- Total sample size is 100 for this analysis to have power of .704
- Note that the power of the final analysis may not be based on the original 10,000 samples (due to the algorithm used). Here, there were 2,000 simulations used when the stopping criteria were reaching, so 1408/2000=.704
- Note that these results may not be exactly the same as those obtained from tabled results, such as those provided by Cohen (1988) — this is due to the sampling process used in Monte Carlo simulations rather than the mathematical formulas used in development of the tables

1. *Topic Description and Objectives:*

- **CASE 2:** Sample size analysis for Independent t-test (pooled variance)
- ***Unequal N, Unequal Variance, Nonstandard Effect Size, Nonstandard Power***

2. *MC2G Program Setup (verify the following input before running analysis):*

	Group 1	Group 2		Value
Population Mean =	100	110	**Number of Means to Keep =**	N/A
Population SD =	10	15	**Statistical Test =**	POOLED *t*
Group Size =	25	10	**Correlation bet. Measures =**	0
Distribution =	NORMAL	NORMAL	**Directionality of Hypothesis =**	TWO-TAILED
Reliability =	1.0	1.0	**Alpha Level =**	0.05
Integer Data =	UNCHECKED	UNCHECKED	**Automatically set...Seed... =**	UNCHECKED
Minimum =	N/A	N/A	**Integer Seed =**	1566
Maximum =	N/A	N/A	**Number of MC Samples =**	10000

3. *Steps Necessary to Run Analysis:*

- Here, the group sizes should be set unequal at the beginning
- Because the sample sizes are unequal at the beginning, the final sample sizes results will have roughly the same ratio as the had at the start.
- For example, Here Group 1 is 2.5 times larger than Group 2 (25 versus 10). In the end, the recommended sample sizes for Group 1 will also be roughly 2.5 times larger than Group 2
- Because this analysis is using a nonstandard value for Power (.75), we must use the "Get N for any Power" option under the Analysis Menu and enter 0.75 in the appropriate box

4. *MC2G Program Output (based on Input Above):*

# Rejections =	3756	**Actual Mean Grp 1 Means =**	99.9774
Actual ALPHA / POWER =	0.7512	**Actual Mean Grp 2 Means =**	109.928
Desired =	0.7500	**Actual SE of Grp 1 Means =**	1.3461
		Actual SE of Grp 2 Means =	3.3230

5. *Key Points to Interpret from the Monte Carlo Results:*

- Based on the Monte Carlo analyses performed with the information provided, 56 cases are needed in Group 1 and 20 are needed in Group 2 (highlighted in yellow on the results screen)
- Total sample size is 76 for this analysis to have power of .7512
- Here, there were 5,000 simulations used when the stopping criteria were reaching, so 3756/5000=.7512
- Note that these sample size recommendations based on several nonstandard criteria are difficult to obtain using tabled results, such as those provided by Cohen (1988)