DOWLING COLLEGE
School of Education
Department of Educational Administration, Leadership, and Technology

EDE 9802: EXPERIMENTAL RESEARCH METHODS
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FINAL ASSESSMENT – Due July 31, 2011

1) Make sure all variables are correctly classified (as Scale, Ordinal, or Nominal). If any are incorrectly classified, explain why.

    - Changed ID from Scale to Nominal, since it is a classification/category…not requiring mathematical computation
    - Changed Gender and Race to Nominal from Ordinal since it is a classification with no magnitude
    - Added variables codes for Program Tutor, Like the program, and Like School

2) Add the following value labels to the appropriate variables below. Answers should refer to these labels, not the original designations (e.g. "Asian or Asian-American" instead of "1."

    a. Gender: 0 = Female, 1 = Male
    b. RaceEthnicity: 1 = Asian or Asian-American, 2 = Black or African-American, 3 = White or European-American
    c. Liketheprogram: 1 = Strongly Dislike, 2 = Dislike, 3 = Neither Like nor Dislike, 4 = Like, 5 = Strongly Like
    d. Like School: 1 = Strongly Dislike, 2 = Dislike, 3 = Neither Like nor Dislike, 4 = Like, 5 = Strongly Like

3) Calculate means and standard deviations for ReadingPrior, ReadingPost, MathPrior, and MathPost.

The following table shows the Statistics table for the means and standard deviations for ReadingPrior, ReadingPost, MathPrior, and MathPost.

Statistics

		ReadingPre	MathPre	ReadingPost	MathPost
N	Valid	116	60	116	60
	Missing	60	116	60	116
Mean		434.47	429.47	453.88	473.10
Median		433.00	412.50	450.00	472.00
Mode		410[a]	387[a]	432[a]	546[a]
Std. Deviation		49.360	56.144	52.456	55.962

a. Multiple modes exist. The smallest value is shown

4) Determine if MathPrior differs significantly from MathPost. Explain by reporting appropriate statistics.

As shown in the table below the means vary (highlighted in yellow) and have small relative standard deviations (highlighted in green), an initial interpretation of that would allow me to predict a significant different in the pre and posttests. This is confirmed in the Paired Samples Test chart below, with a sig. reported of .000 (highlighted in red).

Paired Samples Statistics

		Mean	N	Std. Deviation	Std. Error Mean
Pair 1	MathPost	473.10	60	55.962	7.225
	MathPre	429.47	60	56.144	7.248

Paired Samples Test

		Paired Differences					t	df	Sig. (2-tailed)
		Mean	Std. Deviation	Std. Error Mean	95% Confidence Interval of the Difference Lower	Upper			
Pair 1	MathPost - MathPre	43.633	62.134	8.021	27.583	59.684	5.440	59	.000

5) Determine if ReadingPrior differs significantly from ReadingPost. Explain by reporting appropriate statistics.

As shown in the table below the means vary (highlighted in yellow) and have small relative standard deviations (highlighted in green), an initial interpretation of that would allow me to predict a significant different in the pre and posttests. This is confirmed in the Paired Samples Test chart below, with a sig. reported of .000 (highlighted in red).

Paired Samples Statistics

		Mean	N	Std. Deviation	Std. Error Mean
Pair 1	ReadingPost	453.88	116	52.456	4.870
	ReadingPre	434.47	116	49.360	4.583

Paired Samples Test

		Paired Differences					t	df	Sig. (2-tailed)
		Mean	Std. Deviation	Std. Error Mean	95% Confidence Interval of the Difference Lower	Upper			
Pair 1	ReadingPost - ReadingPre	19.414	55.221	5.127	9.258	29.570	3.787	115	.000

6) Does ReadingPrior differ significantly by race? Explain by reporting appropriate statistics.

In determining the significance of Reading Prior by race, an ANOVA test must be done because there are more than 2 races tested, Asian, Black, and White. As shown in the table below, there is no significance (highlighted in yellow) observed between the groups.

ANOVA

ReadingPre

	Sum of Squares	df	Mean Square	F	Sig.
Between Groups	7813.675	2	3906.837	1.621	.202
Within Groups	272375.187	113	2410.400		
Total	280188.862	115			

7) Do English Language Learners (ELLs) differ significantly from Non-ELL students on Reading Prior? Explain by reporting appropriate statistics.

As shown in the tables below, the Reading Pre test mean for the non-ELL learners is almost 2 standard deviations greater than the ELL learners. This significance is verified by the completion of an independent samples t-test where the significance is determined to be .000 (highlighted in yellow).

Group Statistics

	ELL	N	Mean	Std. Deviation	Std. Error Mean
ReadingPre	No	88	451.34	43.505	4.638
	Yes	28	381.43	20.817	3.934

Independent Samples Test

		Levene's Test for Equality of Variances		t-test for Equality of Means						
									95% Confidence Interval of the Difference	
		F	Sig.	t	df	Sig. (2-tailed)	Mean Difference	Std. Error Difference	Lower	Upper
Reading Pre	Equal variances assumed	10.673	.001	8.192	114	.000	69.912	8.534	53.006	86.819
	Equal variances not assumed			11.496	96.405	.000	69.912	6.082	57.841	81.983

8) Calculate the new variables of ReadingGrowth and MathGrowth (you do not need to provide a response for this item).

Completed using Transform…Compute Variables…Post-Pre= (for both)

9) Calculate Mean, Median, Range, and 25th and 75th percentiles for ReadingGrowth and Math Growth.

Statistics

		ReadingGrowth	Math_Growth
N	Valid	116	60
	Missing	60	116
Mean		19.4138	43.6333
Median		22.0000	45.0000
Range		375.00	239.00
Percentiles	25	-7.7500	-1.0000
	50	22.0000	45.0000
	75	50.5000	97.0000

10) Determine if ReadingGrowth and MathGrowth differs significantly by Gender.

As shown in the tables below, neither Reading Growth or Math Growth differ significantly by males or females. Not only is the standard deviation greater than the mean the independent t-test verifies that observation.

Group Statistics

	Gender	N	Mean	Std. Deviation	Std. Error Mean
ReadingGrowth	female	60	19.5333	64.04566	8.26826
	male	56	19.2857	44.44801	5.93962
Math_Growth	female	32	45.6250	59.53570	10.52452
	male	28	41.3571	66.00293	12.47338

Independent Samples Test

		Levene's Test for Equality of Variances		t-test for Equality of Means						
									95% Confidence Interval of the Difference	
		F	Sig.	t	df	Sig. (2-tailed)	Mean Difference	Std. Error Difference	Lower	Upper
Reading Growth	Equal variances assumed	4.324	.040	.024	114	.981	.24762	10.30517	-20.16685	20.66208
	Equal variances not assumed			.024	105.474	.981	.24762	10.18053	-19.93743	20.43267
Math_Growth	Equal variances assumed	.141	.709	.263	58	.793	4.26786	16.20691	-28.17379	36.70951
	Equal variances not assumed			.262	54.896	.795	4.26786	16.32026	-28.44007	36.97578

11) Does MathGrowth or ReadingGrowth differ significantly by Race? Explain.

To determine if there is a significance between the 3 races and their performance in Growth in either Reading or Math, an ANOVA test has to be conducted. After review, their appears to be no significant difference between the races and their performance on their growth.

Descriptives

		N	Mean	Std. Deviation	Std. Error	95% Confidence Interval for Mean		Minimum	Maximum
						Lower Bound	Upper Bound		
ReadingGrowth	Asian	16	31.0000	65.05997	16.26499	-3.6680	65.6680	-115.00	113.00
	Black	74	18.3919	58.84431	6.84051	4.7588	32.0250	-169.00	206.00
	White	26	15.1923	35.61799	6.98526	.8059	29.5787	-67.00	87.00
	Total	116	19.4138	55.22052	5.12710	9.2580	29.5696	-169.00	206.00
Math_Growth	Asian	2	10.0000	18.38478	13.00000	-155.1807	175.1807	-3.00	23.00
	Black	46	47.4348	66.71487	9.83657	27.6229	67.2467	-94.00	145.00
	White	12	34.6667	45.97891	13.27297	5.4531	63.8803	-31.00	104.00
	Total	60	43.6333	62.13353	8.02140	27.5825	59.6841	-94.00	145.00

ANOVA

		Sum of Squares	df	Mean Square	F	Sig.
ReadingGrowth	Between Groups	2688.464	2	1344.232	.437	.647
	Within Groups	347981.674	113	3079.484		
	Total	350670.138	115			
Math_Growth	Between Groups	3891.962	2	1945.981	.495	.612
	Within Groups	223881.971	57	3927.754		
	Total	227773.933	59			

12) Is there a significant relationship between MathGrowth and the degree to which respondents like the program? Explain by reporting appropriate statistics.

When evaluating a relationship between two variables, a correlation must be determined. This value will be between -1.0 and +1.0. The stronger the relationship the further the value is from 0.0. The relationship is either considered direct or indirect (inverse) if it is respectively positive or negative.

The chart below shows there is a moderate relationship valued at .451 between Math Growth and participants liking the program.

Correlations

		Math_Growth	Liketheprogram
Math_Growth	Pearson Correlation	1	.451*
	Sig. (2-tailed)		.012
	N	60	30
Liketheprogram	Pearson Correlation	.451*	1
	Sig. (2-tailed)	.012	
	N	30	88

*. Correlation is significant at the 0.05 level (2-tailed).

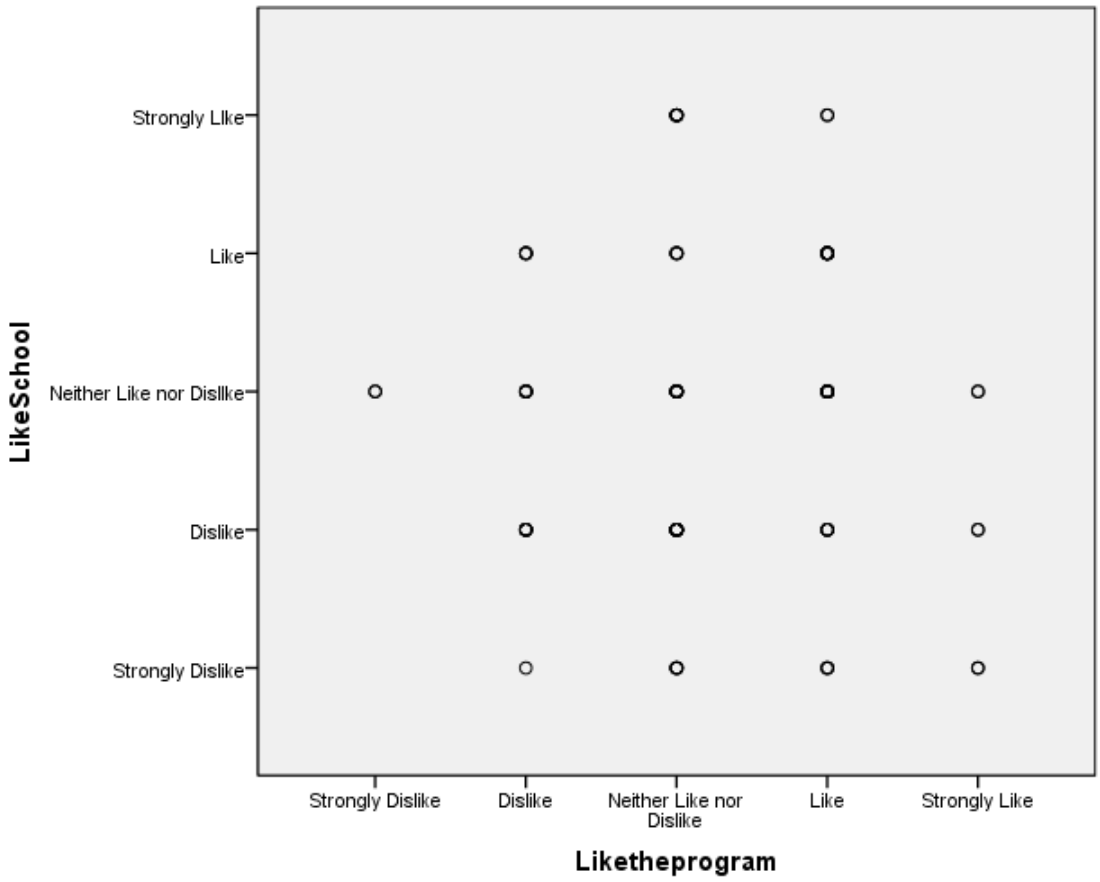
13) Is there a significant relationship between liking the program and liking school? Explain by reporting appropriate statistics (*Use Spearman for this one).

There is almost no relationship between liking the program and liking school as indicated in the Spearman correlational chart below.

Correlations

			Liketheprogram	LikeSchool
Spearman's rho	Liketheprogram	Correlation Coefficient	1.000	.003
		Sig. (2-tailed)	.	.978
		N	88	88
	LikeSchool	Correlation Coefficient	.003	1.000
		Sig. (2-tailed)	.978	.
		N	88	176

This is clearly represented in the scatterplot graph below.



14) Does ReadingGrowth differ significantly by Free & Reduced Lunch status? Explain by reporting appropriate statistics.

In reviewing the chart below, you will notice the means greatly differ for students in free and reduced lunch and those who do not receive.

Group Statistics

	FreeorReducedLunch	N	Mean	Std. Deviation	Std. Error Mean
ReadingGrowth	No	20	1.7000	51.09959	11.42622
	Yes	96	23.1042	55.58066	5.67268

However, after an Independent t-test the significance is not observed, this could have been predicted by looking more closely at the standard deviation calculated above.

Independent Samples Test

		Levene's Test for Equality of Variances		t-test for Equality of Means						
									95% Confidence Interval of the Difference	
		F	Sig.	t	df	Sig. (2-tailed)	Mean Difference	Std. Error Difference	Lower	Upper
Reading Growth	Equal variances assumed	.000	1.000	-1.587	114	.115	-21.40417	13.48429	-48.11645	5.30811
	Equal variances not assumed			-1.678	29.166	.104	-21.40417	12.75687	-47.48845	4.68011

15) Is there a significant relationship between ReadingGrowth and ReadingPrior? Make a prediction and explain your findings.

Based on the prior testing of gender differences and growth on both assessments, I will predict there will be little to no negative relationship with reading growth and reading prior as a result of the program and its participants…

Correlations

		ReadingGrowth	ReadingPre
ReadingGrowth	Pearson Correlation	1	-.502**
	Sig. (2-tailed)		.000
	N	116	116
ReadingPre	Pearson Correlation	-.502**	1
	Sig. (2-tailed)	.000	
	N	116	116

**. Correlation is significant at the 0.01 level (2-tailed).

As the chart shows above, I was correct in stating that it would be an inverse relationship, but the moderate relationship of -.502, is far greater than I had predicted.

16) Did students who participated in the program experience significantly greater mean ReadingGrowth? Make a prediction and explain your findings.

Not being familiar with the program, but previously determining no relationship between students liking the program and liking school, I will predict there will not be a significance between the two variables.

Group Statistics

	Program	N	Mean	Std. Deviation	Std. Error Mean
ReadingGrowth	No	58	26.8793	57.14189	7.50310
	Yes	58	11.9483	52.66392	6.91511

An initial look at the chart above would lead me to conclude my prediction is correct since those that participated actually have a greater standard deviation than those that did not. This is verified by the chart below showing a significance of .146.

Independent Samples Test

		Levene's Test for Equality of Variances		t-test for Equality of Means						
									95% Confidence Interval of the Difference	
		F	Sig.	t	df	Sig. (2-tailed)	Mean Difference	Std. Error Difference	Lower	Upper
Reading Growth	Equal variances assumed	.872	.352	1.463	114	.146	14.93103	10.20369	-5.28239	35.14446
	Equal variances not assumed			1.463	113.249	.146	14.93103	10.20369	-5.28383	35.14590

17) Did students who participated in the program experience significantly greater mean MathGrowth? Make a prediction and explain your findings.

If I am to be so bold as to think much of this data is from the study you, Dr. Perry, collected as a statistician out in California, I would predict their will once again, be no significance…

Independent Samples Test

		Levene's Test for Equality of Variances		t-test for Equality of Means						
									95% Confidence Interval of the Difference	
		F	Sig.	t	df	Sig. (2-tailed)	Mean Difference	Std. Error Difference	Lower	Upper
Math_Growth	Equal variances assumed	.002	.967	-1.844	58	.070	-29.00000	15.72606	-60.47914	2.47914
	Equal variances not assumed			-1.844	57.980	.070	-29.00000	15.72606	-60.47938	2.47938

As indicated above, although approaching significance, the data indicates there is none.

18) From this question forward, select out students that did not participate in the program (the program = 0 people). Are there significant relationships between the number of days in the program, liking the program, ReadingGrowth, and MathGrowth?

Since we are looking only at those students who participated in the study, we must select out for the number of days and liking the program variables, since data will not exist for those subjects.

Under Select cases…If condition is satisfied….program =1

Correlations

		Liketheprogram	Math_Growth	ReadingGrowth	ProgramHours
Liketheprogram	Pearson Correlation	1	.451*	.520**	.819**
	Sig. (2-tailed)		.012	.000	.000
	N	88	30	58	88
Math_Growth	Pearson Correlation	.451*	1	.a	.304
	Sig. (2-tailed)	.012		.	.102
	N	30	30	0	30
ReadingGrowth	Pearson Correlation	.520**	.a	1	.636**
	Sig. (2-tailed)	.000	.		.000
	N	58	0	58	58
ProgramHours	Pearson Correlation	.819**	.304	.636**	1
	Sig. (2-tailed)	.000	.102	.000	
	N	88	30	58	88

*. Correlation is significant at the 0.05 level (2-tailed).

**. Correlation is significant at the 0.01 level (2-tailed).

a. Cannot be computed because at least one of the variables is constant.

19) For students that participated in the reading program, how well can you predict ReadingGrowth? Conduct a linear regression (enter method) using ProgramHours, ReadingPre, and demographic variables.

Coefficients[a]

Model		Unstandardized Coefficients		Standardized Coefficients	t	Sig.
		B	Std. Error	Beta		
1	(Constant)	141.212	54.711		2.581	.013
	Gender	7.023	10.506	.067	.668	.507
	ReadingPre	-.423	.111	-.364	-3.806	.000
	RaceEthnicity	-13.040	8.082	-.154	-1.614	.113
	ProgramHours	2.783	.457	.615	6.092	.000

a. Dependent Variable: ReadingGrowth

20) For students that participated in the math program, how well can you predict MathGrowth? Conduct a linear regression (enter method) using ProgramHours, MathPre, and demographic variables.

Coefficients[a]

Model		Unstandardized Coefficients		Standardized Coefficients	t	Sig.
		B	Std. Error	Beta		
1	(Constant)	-156.358	84.533		-1.850	.078
	ProgramHours	3.228	1.237	.579	2.610	.016
	Grade	15.155	23.479	.125	.645	.525
	ELL	-18.090	22.132	-.132	-.817	.422
	FreeorReducedLunch	52.566	41.787	.217	1.258	.222
	SpecialEd	-93.997	50.804	-.388	-1.850	.078
	Gender	-61.549	23.279	-.508	-2.644	.015
	RaceEthnicity	21.498	26.571	.177	.809	.427

a. Dependent Variable: Math_Growth