

# California Critical Thinking Skills Test (CCTST)

- Comparing Independent samples, Freshmen to Seniors of the same year.

# CCTST Overall Comparison of HLGU Freshmen to Seniors

Year	# of Freshmen	# of Seniors	<i>p</i>	< .05
2011-12	136	75	0.00797	Yes
2012-13	128	54	0.0156	Yes
2013-14	98	80	0.008	Yes
2014-15	112	85	<0.0001	Yes
2015-16	119	99	0.00753	Yes
2016-17	92	86	0.00128	Yes

# HLGU Analysis by Subtest Comparison—Freshmen to Seniors *p* values

	2011-12	2012-13	2013-14	2014-15	2015-16	2016-17
Analysis	<b>0.00117</b> *	0.65477	0.6257	<b>0.0056</b> *	<b>0.00753</b> *	0.17259
Inference	<b>0.03509</b> *	<b>0.00065</b> *	<b>0.01148</b> *	<b>&lt;0.0001</b> *	<b>0.00417</b> *	<b>0.0009</b> *
Evaluation	0.12259	0.12614	<b>0.02143</b> *	<b>0.01</b> *	0.07142	<b>0.00859</b> *
Induction	0.09442	<b>0.0402</b> *	<b>0.00637</b> *	<b>&lt;0.0001</b> *	<b>0.03648</b> *	<b>0.00056</b> *
Deduction	<b>0.00181</b> *	<b>0.02475</b> *	<b>0.03087</b> *	<b>0.0016</b> *	<b>0.00154</b> *	<b>0.02861</b> *

# Comparison of Statistical Significance between Freshmen & Seniors

	2011-12	2012-13	2013-14	2014-15	2015-16	2016-17
Analysis	+			+	+	
Inference	+	+	+	+	+	+
Evaluation			+	+		+
Induction		+	+	+	+	+
Deduction	+	+	+	+	+	+

# Matched Pairs

- By matching student numbers—freshman and senior of the same student
- in 2015-16, we had 39 matched pairs
- in 2016-17, we had 25 matched pairs
- The number of matched pairs may be small, but a causal effect can then be implied.

# Matched Pairs—2016 Seniors

- Mean of the Difference between Spring Seniors and Fall Freshmen (39 students)

	P-value	< .05
Composite	0.0134	+
Analysis	0.3615	
Inference	0.1559	
Evaluation	0.0014	+
Induction	0.0573	borderline
Deduction	0.0344	+

# Matched Pairs—2017 Seniors

- Mean of the Difference between Spring Seniors and Fall Freshmen (25 students)

	P-value	< .05
Composite	0.022	+
Analysis	0.3445	
Inference	0.0096	+
Evaluation	0.4637	
Induction	0.119	
Deduction	0.0738	borderline