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APPENDIX

APPENDIX

Contents **Pages**

Descriptives

	ferrule			Statistic	Std. Error
FORCE	ไม่มีferrule	Mean		740.0719	43.52276
		95% Confidence Interval for Mean	Lower Bound	647.3053	
			Upper Bound	832.8384	
		5% Trimmed Mean		748.6171	
		Median		694.5300	
		Variance		30307.686	
		Std. Deviation		174.09103	
		Minimum		325.39	
		Maximum		1000.94	
		Range		675.55	
		Interquartile Range		269.4850	
		Skewness		-.549	.564
		Kurtosis		.664	1.091
	มีferrule	Mean		1407.0450	55.73358
		95% Confidence Interval for Mean	Lower Bound	1288.2517	
			Upper Bound	1525.8383	
		5% Trimmed Mean		1406.7833	
		Median		1388.0250	
		Variance		49699.717	
		Std. Deviation		222.93433	
		Minimum		1024.29	
		Maximum		1794.51	
		Range		770.22	
		Interquartile Range		378.4225	
		Skewness		-.043	.564
		Kurtosis		-.784	1.091

Tests of Normality

		Kolmogorov-Smirnov(a)			Shapiro-Wilk		
	ferrule	Statistic	df	Sig.	Statistic	df	Sig.
FORCE	ไม่มี ferrule	.156	16	.200(*)	.930	16	.241
	มีferrule	.109	16	.200(*)	.976	16	.919

* This is a lower bound of the true significance.

a Lilliefors Significance Correction

Descriptives

	post			Statistic	Std. Error
FORCE	no fit	Mean		1003.9475	93.66114
		95% Confidence Interval for Mean	Lower Bound	804.3135	
			Upper Bound	1203.5815	
		5% Trimmed Mean		1013.6722	
		Median		1061.9250	
		Variance		140358.556	
		Std. Deviation		374.64457	
		Minimum		325.39	
		Maximum		1507.46	
		Range		1182.07	
		Interquartile Range		671.9150	
		Skewness		-.174	.564
		Kurtosis		-1.372	1.091
	fit	Mean		1143.1694	102.03137
		95% Confidence Interval for Mean	Lower Bound	925.6947	
			Upper Bound	1360.6441	
		5% Trimmed Mean		1139.5921	
		Median		1012.6150	
		Variance		166566.404	
		Std. Deviation		408.12548	
		Minimum		556.22	
		Maximum		1794.51	
		Range		1238.29	
		Interquartile Range		781.7300	
		Skewness		.319	.564
		Kurtosis		-1.402	1.091

Tests of Normality

		Kolmogorov-Smirnov(a)			Shapiro-Wilk		
	post	Statistic	df	Sig.	Statistic	df	Sig.
FORCE	no fit	.199	16	.089	.908	16	.108
	fit	.191	16	.122	.907	16	.103

a Lilliefors Significance Correction

Test of Homogeneity of Variances

FORCE

Levene Statistic	df1	df2	Sig.
1.310	1	30	.261

ANOVA

FORCE

	Sum of Squares	df	Mean Square	F	Sig.
Between Groups	3558825.196	1	3558825.196	88.962	.000
Within Groups	1200111.038	30	40003.701		
Total	4758936.234	31			

Test of Homogeneity of Variances

FORCE

Levene Statistic	df1	df2	Sig.
.114	1	30	.738

ANOVA

FORCE

	Sum of Squares	df	Mean Square	F	Sig.
Between Groups	155061.844	1	155061.844	1.010	.323
Within Groups	4603874.390	30	153462.480		
Total	4758936.234	31			

Univariate

Tests of Between-Subjects Effects

Dependent Variable: FORCE

Source	Type III Sum of Squares	df	Mean Square	F	Sig.
Corrected Model	3714013.723(a)	3	1238004.574	33.174	.000
Intercept	36880886.999	1	36880886.999	988.269	.000
FERRULE	3558825.196	1	3558825.196	95.363	.000
POSTDIAM	155061.844	1	155061.844	4.155	.051
FERRULE * POSTDIAM	126.683	1	126.683	.003	.954
Error	1044922.511	28	37318.661		
Total	41639823.234	32			
Corrected Total	4758936.234	31			

a R Squared = .780 (Adjusted R Squared = .757)

T-test

Group Statistics

	ferrule	N	Mean	Std. Deviation	Std. Error Mean
FORCE	ไม่มี ferrule	16	740.0719	174.09103	43.52276
	มีferrule	16	1407.0450	222.93433	55.73358

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
FORCE	Equal variances assumed	1.310	.261	-9.432	30	.000	-666.9731	70.71395	-811.39028	-522.55597
	Equal variances not assumed			-9.432	28.335	.000	-666.9731	70.71395	-811.74688	-522.19937

T-test

Group Statistics

	post	N	Mean	Std. Deviation	Std. Error Mean
FORCE	no fit	16	1003.9475	374.64457	93.66114
	fit	16	1143.1694	408.12548	102.03137

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
FORCE	Equal variances assumed	.114	.738	-1.005	30	.323	-139.2219	138.50202	-422.08074	143.63699
	Equal variances not assumed		.	-1.005	29.783	.323	-139.2219	138.50202	-422.16725	143.72350

Descriptives

ferrule		post			Statistic	Std. Error
ไม่มีferrule	FORCE	no fit	Mean		668.4713	60.18847
			95% Confidence Interval for Mean	Lower Bound	526.1481	
				Upper Bound	810.7944	
			5% Trimmed Mean		673.3308	
			Median		674.1350	
			Variance		28981.214	
			Std. Deviation		170.23870	
			Minimum		325.39	
			Maximum		924.08	
			Range		598.69	
			Interquartile Range		140.7725	
			Skewness		-.833	.752
			Kurtosis		2.616	1.481
		fit	Mean		811.6725	55.05199
			95% Confidence Interval for Mean	Lower Bound	681.4952	
				Upper Bound	941.8498	
			5% Trimmed Mean		815.3494	
			Median		849.7950	
			Variance		24245.771	
			Std. Deviation		155.71054	
			Minimum		556.22	
			Maximum		1000.94	
			Range		444.72	
			Interquartile Range		248.5025	
			Skewness		-.469	.752

			Kurtosis		-1.107	1.481
ſiferrule	FORCE	no fit	Mean		1339.4238	42.63650
			95% Confidence Interval for Mean	Lower Bound	1238.6044	
				Upper Bound	1440.2431	
			5% Trimmed Mean		1337.8469	
			Median		1341.2850	
			Variance		14542.972	
			Std. Deviation		120.59425	
			Minimum		1199.77	
			Maximum		1507.46	
			Range		307.69	
			Interquartile Range		249.2725	
			Skewness		.337	.752
			Kurtosis		-1.322	1.481
		fit	Mean		1474.6663	100.93605
			95% Confidence Interval for Mean	Lower Bound	1235.9904	
				Upper Bound	1713.3421	
			5% Trimmed Mean		1481.9181	
			Median		1596.2550	
			Variance		81504.687	
			Std. Deviation		285.49026	
			Minimum		1024.29	
			Maximum		1794.51	
			Range		770.22	
			Interquartile Range		524.5400	
			Skewness		-.855	.752
			Kurtosis		-.739	1.481

Tests of Normality

			Kolmogorov-Smirnov(a)			Shapiro-Wilk		
ferrule		post	Statistic	df	Sig.	Statistic	df	Sig.
ſiferrule	FORCE	no fit	.275	8	.076	.889	8	.230
		fit	.249	8	.157	.926	8	.479
ſiferrule	FORCE	no fit	.187	8	.200(*)	.898	8	.278
		fit	.284	8	.056	.864	8	.132

* This is a lower bound of the true significance.

a Lilliefors Significance Correction

One-way

Test of Homogeneity of Variances

FORCE

Levene Statistic	df1	df2	Sig.
2.752	3	28	.061

ANOVA

FORCE

	Sum of Squares	df	Mean Square	F	Sig.
Between Groups	3714013.723	3	1238004.574	33.174	.000
Within Groups	1044922.511	28	37318.661		
Total	4758936.234	31			

One-way

Descriptives

FORCE

	N	Mean	Std. Deviation	Std. Error	95% Confidence Interval for Mean		Minimum	Maximum
					Lower Bound	Upper Bound		
1	8	1474.6663	285.49026	100.93605	1235.9904	1713.3421	1024.29	1794.51
2	8	1339.4238	120.59425	42.63650	1238.6044	1440.2431	1199.77	1507.46
3	8	811.6725	155.71054	55.05199	681.4952	941.8498	556.22	1000.94
4	8	668.4712	170.23870	60.18847	526.1481	810.7944	325.39	924.08
Total	32	1073.5584	391.80872	69.26265	932.2963	1214.8205	325.39	1794.51

Test of Homogeneity of Variances

FORCE

Levene Statistic	df1	df2	Sig.
2.752	3	28	.061

ANOVA

FORCE

	Sum of Squares	df	Mean Square	F	Sig.
Between Groups	3714013.723	3	1238004.574	33.174	.000
Within Groups	1044922.511	28	37318.661		
Total	4758936.234	31			

Post Hoc test

Multiple Comparisons

Dependent Variable: FORCE
Tukey HSD

(I) GROUP	(J) GROUP	Mean Difference (I-J)	Std. Error	Sig.	95% Confidence Interval	
					Lower Bound	Upper Bound
1	2	135.2425	96.59019	.510	-128.4788	398.9638
	3	662.9937(*)	96.59019	.000	399.2724	926.7151
	4	806.1950(*)	96.59019	.000	542.4737	1069.9163
2	1	-135.2425	96.59019	.510	-398.9638	128.4788
	3	527.7512(*)	96.59019	.000	264.0299	791.4726
	4	670.9525(*)	96.59019	.000	407.2312	934.6738
3	1	-662.9937(*)	96.59019	.000	-926.7151	-399.2724
	2	-527.7512(*)	96.59019	.000	-791.4726	-264.0299
	4	143.2013	96.59019	.461	-120.5201	406.9226
4	1	-806.1950(*)	96.59019	.000	-1069.9163	-542.4737
	2	-670.9525(*)	96.59019	.000	-934.6738	-407.2312
	3	-143.2013	96.59019	.461	-406.9226	120.5201

* The mean difference is significant at the .05 level.

FORCE

Tukey HSD

GROUP	N	Subset for alpha = .05	
		1	2
4	8	668.4712	
3	8	811.6725	
2	8		1339.4238
1	8		1474.6663
Sig.		.461	.510

Means for groups in homogeneous subsets are displayed.
a Uses Harmonic Mean Sample Size = 8.000.

BIOGRAPHY

NAME	Miss Arpaporn Pongpattarin
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