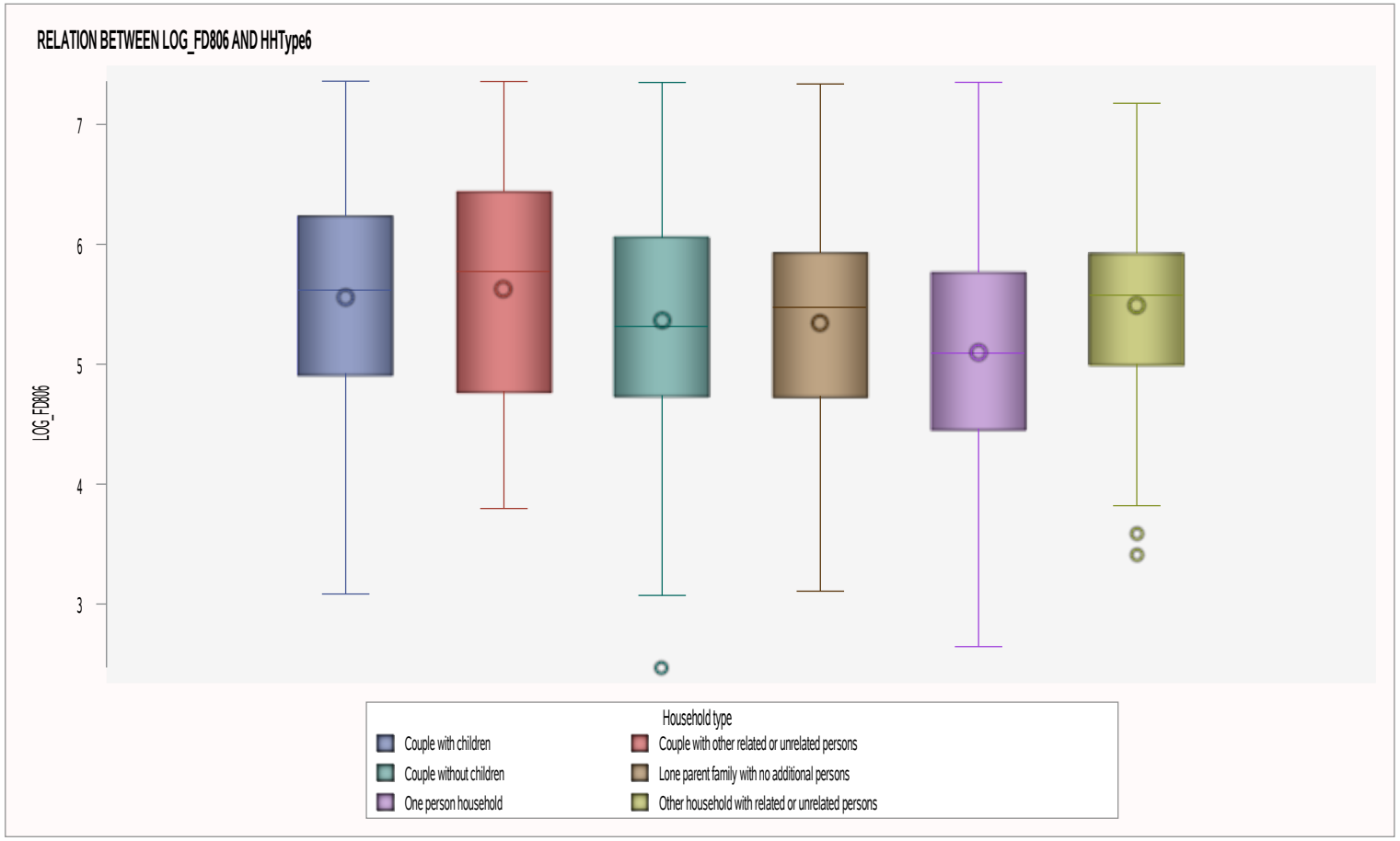
BIVARIATE ANALYSIS OF HHType6 AND LOG_FD806 FOR ANA.MODEL2
RELATION BETWEEN LOG_FD806 AND HHType6

The MEANS Procedure

Analysis Variable : LOG_FD806														
Household type	N Obs	N	N Miss	Minimum	Lower Quartile	Median	Mean	Upper Quartile	Maximum	Quartile Range	Coeff of Variation	Lower 95% CL for Mean	Upper 95% CL for Mean	Skewness
Couple with children	2457237	2457237	0	3.08	4.91	5.62	5.56	6.24	7.36	1.33	16.53	5.56	5.56	-0.29
Couple with other related or unrelated persons	557180	557180	0	3.80	4.76	5.77	5.63	6.44	7.36	1.68	17.07	5.62	5.63	-0.38
Couple without children	2206478	2206478	0	2.47	4.73	5.32	5.37	6.05	7.35	1.33	17.05	5.37	5.37	-0.08
Lone parent family with no additional persons	513225	513225	0	3.11	4.72	5.47	5.34	5.93	7.34	1.21	16.86	5.34	5.34	-0.24
One person household	1964999	1964999	0	2.64	4.45	5.09	5.10	5.77	7.35	1.32	18.78	5.10	5.10	0.08
Other household with related or unrelated persons	429757	429757	0	3.41	4.99	5.58	5.49	5.92	7.18	0.94	14.77	5.49	5.49	-0.35



One-way ANOVA Assumptions
In order to run a one-way ANOVA the following assumptions must be met:
1.The response of interest is continuous and normally distributed for each treatment group:
Normality test: PROC UNIVARIATE NORMAL and QQPlot for each group.
2.Treatment groups are independent of one another. Experimental units only receive one treatment,and they do not overlap.
3.There are no major outliers.
4.A check for unequal variances will help determine which version of a one-way ANOVA is most appropriate
(Levene's test, Null hypothesis: variances are equal between groups):
A .If variances are equal, then the assumptions of a standard one-way ANOVA are met.
B. If variances are unequal, then a Welch's one-way ANOVA is appropriate.

Normal Distribution?
Null hypothesis: sample has a normal distribution
CLT :
a.If it looks normal and each group have more than 30 observations
b.If moderately skewed, each group must have more than 100 observations
*rule of thumb: If skewness is between -1 and -0.5 or between 0.5 and 1, the distribution is moderately skewed.
*if the sample size is over 2000, the Kolmgorov test should be used. If the sample size is less than 2000, the Shapiro test is better.

The UNIVARIATE Procedure
Variable: LOG_FD806

Freq: WeightD

Household type=Couple with children

Moments			
N	2457237	**Sum Weights**	2457237
Mean	5.55694286	**Sum Observations**	13654725.6
Std Deviation	0.91854558	**Variance**	0.84372598
Skewness	-0.2884932	**Kurtosis**	-0.4780882
Uncorrected SS	77951763.8	**Corrected SS**	2073233.85
Coeff Variation	16.5296927	**Std Error Mean**	0.00058597

Basic Statistical Measures			
Location		**Variability**	
Mean	5.556943	**Std Deviation**	0.91855
Median	5.618479	**Variance**	0.84373
Mode	5.680343	**Range**	4.27700
		Interquartile Range	1.32507

The UNIVARIATE Procedure
Variable: LOG_FD806

Freq: WeightD

Household type=Couple with children

Tests for Location: Mu0=0				
Test	**Statistic**		**p Value**	
Student's t	**t**	9483.284	**Pr > |t|**	<.0001
Sign	**M**	1228619	**Pr >= |M|**	<.0001
Signed Rank	**S**	1.51E12	**Pr >= |S|**	<.0001

Tests for Normality				
Test	**Statistic**		**p Value**	
Kolmogorov-Smirnov	**D**	0.041799	**Pr > D**	<0.0100
Cramer-von Mises	**W-Sq**	1011.795	**Pr > W-Sq**	<0.0050
Anderson-Darling	**A-Sq**	7695.114	**Pr > A-Sq**	<0.0050

Quantiles (Definition 5)	
Level	**Quantile**
100% Max	7.36074
99%	7.29261
95%	7.04319
90%	6.66675
75% Q3	6.23566
50% Median	5.61848
25% Q1	4.91059
10%	4.25873
5%	3.94623
1%	3.33506
0% Min	3.08374

The UNIVARIATE Procedure
Variable: LOG_FD806

Freq: WeightD

Household type=Couple with children

Extreme Observations					
Lowest			Highest		
Value	Freq	Obs	Value	Freq	Obs
3.08374	3250	434	7.33995	1345	349
3.15274	132	595	7.34003	776	694
3.21727	186	16	7.34357	669	376
3.25810	1093	99	7.35361	491	626
3.26805	1144	289	7.36074	43	146

The UNIVARIATE Procedure
Variable: LOG_FD806

Freq: WeightD

Household type=Couple with other related or unrelated persons

Moments			
N	557180	**Sum Weights**	557180
Mean	5.62580255	**Sum Observations**	3134584.66
Std Deviation	0.96058476	**Variance**	0.92272307
Skewness	-0.3818358	**Kurtosis**	-0.9360414
Uncorrected SS	18148676.3	**Corrected SS**	514121.919
Coeff Variation	17.0746262	**Std Error Mean**	0.00128688

The UNIVARIATE Procedure
Variable: LOG_FD806

Freq: WeightD

Household type=Couple with other related or unrelated persons

Basic Statistical Measures			
Location		**Variability**	
Mean	5.625803	**Std Deviation**	0.96058
Median	5.773122	**Variance**	0.92272
Mode	6.488141	**Range**	3.56182
		Interquartile Range	1.67842

Tests for Location: Mu0=0				
Test	**Statistic**		**p Value**	
Student's t	**t**	4371.662	**Pr > |t|**	<.0001
Sign	**M**	278590	**Pr >= |M|**	<.0001
Signed Rank	**S**	7.761E10	**Pr >= |S|**	<.0001

Tests for Normality				
Test	**Statistic**		**p Value**	
Kolmogorov-Smirnov	**D**	0.110996	**Pr > D**	<0.0100
Cramer-von Mises	**W-Sq**	1932.028	**Pr > W-Sq**	<0.0050
Anderson-Darling	**A-Sq**	11781.56	**Pr > A-Sq**	<0.0050

Quantiles (Definition 5)	
Level	**Quantile**
100% Max	7.35843
99%	7.28909
95%	6.92992
90%	6.65368

The UNIVARIATE Procedure
Variable: LOG_FD806

Freq: WeightD

Household type=Couple with other related or unrelated persons

Quantiles (Definition 5)	
Level	**Quantile**
75% Q3	6.43948
50% Median	5.77312
25% Q1	4.76106
10%	4.07923
5%	3.95124
1%	3.79661
0% Min	3.79661

Extreme Observations					
Lowest			**Highest**		
Value	**Freq**	**Obs**	**Value**	**Freq**	**Obs**
3.79661	12589	713	7.04349	1539	714
3.95124	21675	764	7.08256	60	728
3.95623	36	787	7.16671	1523	716
4.01530	16745	724	7.28909	12702	752
4.07923	20541	733	7.35843	4907	761

The UNIVARIATE Procedure
Variable: LOG_FD806

Freq: WeightD

Household type=Couple without children

Moments			
N	2206478	**Sum Weights**	2206478
Mean	5.36827009	**Sum Observations**	11844969.9
Std Deviation	0.91508788	**Variance**	0.83738583
Skewness	-0.0773114	**Kurtosis**	-0.6184178
Uncorrected SS	65434670	**Corrected SS**	1847672.57
Coeff Variation	17.046234	**Std Error Mean**	0.00061605

Basic Statistical Measures			
Location		**Variability**	
Mean	5.368270	**Std Deviation**	0.91509
Median	5.316059	**Variance**	0.83739
Mode	5.248812	**Range**	4.87950
		Interquartile Range	1.32880

Tests for Location: Mu0=0				
Test	**Statistic**		**p Value**	
Student's t	**t**	8714.076	**Pr > |t|**	<.0001
Sign	**M**	1103239	**Pr >= |M|**	<.0001
Signed Rank	**S**	1.217E12	**Pr >= |S|**	<.0001

The UNIVARIATE Procedure
Variable: LOG_FD806

Freq: WeightD

Household type=Couple without children

Tests for Normality				
Test	**Statistic**		**p Value**	
Kolmogorov-Smirnov	**D**	0.039008	**Pr > D**	<0.0100
Cramer-von Mises	**W-Sq**	612.9778	**Pr > W-Sq**	<0.0050
Anderson-Darling	**A-Sq**	4703.488	**Pr > A-Sq**	<0.0050

Quantiles (Definition 5)	
Level	**Quantile**
100% Max	7.35014
99%	7.17749
95%	6.84050
90%	6.62263
75% Q3	6.05477
50% Median	5.31606
25% Q1	4.72597
10%	4.08665
5%	3.89467
1%	3.38912
0% Min	2.47064

The UNIVARIATE Procedure
Variable: LOG_FD806

Freq: WeightD

Household type=Couple without children

Extreme Observations					
Lowest			Highest		
Value	Freq	Obs	Value	Freq	Obs
2.47064	3940	947	7.26582	1379	850
3.07177	347	1430	7.30361	5912	1242
3.08374	1372	1393	7.32095	5649	804
3.22764	463	1098	7.32214	2134	1344
3.23789	987	923	7.35014	1360	955

The UNIVARIATE Procedure
Variable: LOG_FD806

Freq: WeightD

Household type=Lone parent family with no additional persons

Moments			
N	513225	**Sum Weights**	513225
Mean	5.34240093	**Sum Observations**	2741853.72
Std Deviation	0.90069822	**Variance**	0.81125728
Skewness	-0.2365959	**Kurtosis**	-0.5129508
Uncorrected SS	15064438.6	**Corrected SS**	416356.705
Coeff Variation	16.8594276	**Std Error Mean**	0.00125726

The UNIVARIATE Procedure
Variable: LOG_FD806

Freq: WeightD

Household type=Lone parent family with no additional persons

Basic Statistical Measures			
Location		**Variability**	
Mean	5.342401	**Std Deviation**	0.90070
Median	5.474285	**Variance**	0.81126
Mode	3.990464	**Range**	4.23016
		Interquartile Range	1.20732

Tests for Location: Mu0=0				
Test	**Statistic**		**p Value**	
Student's t	**t**	4249.238	**Pr > |t|**	<.0001
Sign	**M**	256612.5	**Pr >= |M|**	<.0001
Signed Rank	**S**	6.585E10	**Pr >= |S|**	<.0001

Tests for Normality				
Test	**Statistic**		**p Value**	
Kolmogorov-Smirnov	**D**	0.103706	**Pr > D**	<0.0100
Cramer-von Mises	**W-Sq**	942.7026	**Pr > W-Sq**	<0.0050
Anderson-Darling	**A-Sq**	5252.118	**Pr > A-Sq**	<0.0050

Quantiles (Definition 5)	
Level	**Quantile**
100% Max	7.33743
99%	7.10462
95%	6.74412
90%	6.54276

The UNIVARIATE Procedure
Variable: LOG_FD806

Freq: WeightD

Household type=Lone parent family with no additional persons

Quantiles (Definition 5)	
Level	**Quantile**
75% Q3	5.92831
50% Median	5.47429
25% Q1	4.72100
10%	3.99046
5%	3.80355
1%	3.39786
0% Min	3.10727

Extreme Observations					
Lowest			**Highest**		
Value	**Freq**	**Obs**	**Value**	**Freq**	**Obs**
3.10727	381	1694	7.13159	990	1608
3.21727	1553	1717	7.16410	1554	1669
3.39786	5372	1685	7.27891	505	1680
3.58129	14896	1650	7.28345	442	1578
3.70549	629	1663	7.33743	836	1581

The UNIVARIATE Procedure
Variable: LOG_FD806

Freq: WeightD

Household type=One person household

Moments			
N	1964999	**Sum Weights**	1964999
Mean	5.09706631	**Sum Observations**	10015730.2
Std Deviation	0.95714818	**Variance**	0.91613264
Skewness	0.07979068	**Kurtosis**	-0.3473517
Uncorrected SS	52851039.9	**Corrected SS**	1800198.81
Coeff Variation	18.7784134	**Std Error Mean**	0.00068281

Basic Statistical Measures			
Location		**Variability**	
Mean	5.097066	**Std Deviation**	0.95715
Median	5.092277	**Variance**	0.91613
Mode	5.958166	**Range**	4.70633
		Interquartile Range	1.31732

Tests for Location: Mu0=0				
Test	**Statistic**		**p Value**	
Student's t	**t**	7464.87	**Pr > |t|**	<.0001
Sign	**M**	982499.5	**Pr >= |M|**	<.0001
Signed Rank	**S**	9.653E11	**Pr >= |S|**	<.0001

The UNIVARIATE Procedure
Variable: LOG_FD806

Freq: WeightD

Household type=One person household

Tests for Normality				
Test	**Statistic**		**p Value**	
Kolmogorov-Smirnov	**D**	0.037467	**Pr > D**	<0.0100
Cramer-von Mises	**W-Sq**	481.3685	**Pr > W-Sq**	<0.0050
Anderson-Darling	**A-Sq**	3328.717	**Pr > A-Sq**	<0.0050

Quantiles (Definition 5)	
Level	**Quantile**
100% Max	7.35109
99%	7.11486
95%	6.81928
90%	6.39533
75% Q3	5.76525
50% Median	5.09228
25% Q1	4.44793
10%	3.92593
5%	3.53777
1%	3.02237
0% Min	2.64476

The UNIVARIATE Procedure
Variable: LOG_FD806

Freq: WeightD

Household type=One person household

Extreme Observations					
Lowest			Highest		
Value	Freq	Obs	Value	Freq	Obs
2.64476	15313	1988	7.20510	5467	2161
2.71337	1520	2118	7.21127	1683	2179
3.02237	4062	1974	7.27547	1311	1807
3.03495	8060	2007	7.27783	46	1753
3.05777	7665	2017	7.35109	759	1888

The UNIVARIATE Procedure
Variable: LOG_FD806

Freq: WeightD

Household type=Other household with related or unrelated persons

Moments			
N	429757	Sum Weights	429757
Mean	5.48983025	Sum Observations	2359292.98
Std Deviation	0.81070602	Variance	0.65724425
Skewness	-0.352329	Kurtosis	0.19184912
Uncorrected SS	13234572.6	Corrected SS	282454.662
Coeff Variation	14.7674151	Std Error Mean	0.00123666

The UNIVARIATE Procedure
Variable: LOG_FD806

Freq: WeightD

Household type=Other household with related or unrelated persons

Basic Statistical Measures			
Location		**Variability**	
Mean	5.489830	**Std Deviation**	0.81071
Median	5.575570	**Variance**	0.65724
Mode	4.952300	**Range**	3.77018
		Interquartile Range	0.93585

Tests for Location: Mu0=0				
Test	**Statistic**		**p Value**	
Student's t	**t**	4439.223	**Pr > |t|**	<.0001
Sign	**M**	214878.5	**Pr >= |M|**	<.0001
Signed Rank	**S**	4.617E10	**Pr >= |S|**	<.0001

Tests for Normality				
Test	**Statistic**		**p Value**	
Kolmogorov-Smirnov	**D**	0.0806	**Pr > D**	<0.0100
Cramer-von Mises	**W-Sq**	391.7784	**Pr > W-Sq**	<0.0050
Anderson-Darling	**A-Sq**	2667.195	**Pr > A-Sq**	<0.0050

Quantiles (Definition 5)	
Level	**Quantile**
100% Max	7.17670
99%	7.14419
95%	6.96876
90%	6.56021

The UNIVARIATE Procedure
Variable: LOG_FD806

Freq: WeightD

Household type=Other household with related or unrelated persons

Quantiles (Definition 5)	
Level	**Quantile**
75% Q3	5.92383
50% Median	5.57557
25% Q1	4.98798
10%	4.35002
5%	3.97594
1%	3.40652
0% Min	3.40652

Extreme Observations					
Lowest			**Highest**		
Value	**Freq**	**Obs**	**Value**	**Freq**	**Obs**
3.40652	12248	2257	6.98258	2800	2245
3.58269	838	2309	6.98764	644	2230
3.81991	6607	2313	6.99027	10294	2251
3.95124	1422	2226	7.14419	1518	2278
3.97594	8041	2261	7.17670	3082	2287

Null hypothesis: equal variances
a.If variances are equal, then a pooled t-test is appropriate
b.If variances are unequal, then a Satterthwaite (also known as Welch's) test is appropriate

The GLM Procedure

Class Level Information		
Class	**Levels**	**Values**
HHType6	6	Couple with children Couple with other related or unrelated persons Couple without children Lone parent family with no additional persons One person household Other household with related or unrelated persons

Number of Observations Read	2327
Number of Observations Used	2327
Sum of Frequencies Read	8128876
Sum of Frequencies Used	8128876

The GLM Procedure

Dependent Variable: LOG_FD806

Frequency: WeightD

Source	DF	Sum of Squares	Mean Square	F Value	Pr > F
Model	5	274072.502	54814.500	64259.8	<.0001
Error	8.13E6	6934038.512	0.853		
Corrected Total	8.13E6	7208111.014			

R-Square	Coeff Var	Root MSE	LOG_FD806 Mean
0.038023	17.16007	0.923587	5.382190

Source	DF	Type I SS	Mean Square	F Value	Pr > F
HHType6	5	274072.5021	54814.5004	64259.8	<.0001

Source	DF	Type III SS	Mean Square	F Value	Pr > F
HHType6	5	274072.5021	54814.5004	64259.8	<.0001

The GLM Procedure

Levene's Test for Homogeneity of LOG_FD806 Variance ANOVA of Absolute Deviations from Group Means					
Source	DF	Sum of Squares	Mean Square	F Value	Pr > F
HHType6	5	10401.9	2080.4	7276.31	<.0001
Error	8.13E6	2324137	0.2859		

Welch's ANOVA for LOG_FD806			
Source	DF	F Value	Pr > F
HHType6	5.0000	61587.9	<.0001
Error	1932349		

The GLM Procedure

Level of HHType6	N	LOG_FD806	
		Mean	Std Dev
Couple with children	2457237	5.55694286	0.91854558
Couple with other related or unrelated persons	557180	5.62580255	0.96058476
Couple without children	2206478	5.36827009	0.91508788
Lone parent family with no additional persons	513225	5.34240093	0.90069822
One person household	1964999	5.09706631	0.95714818
Other household with related or unrelated persons	429757	5.48983025	0.81070602

The GLM Procedure
Least Squares Means
Adjustment for Multiple Comparisons: Tukey-Kramer

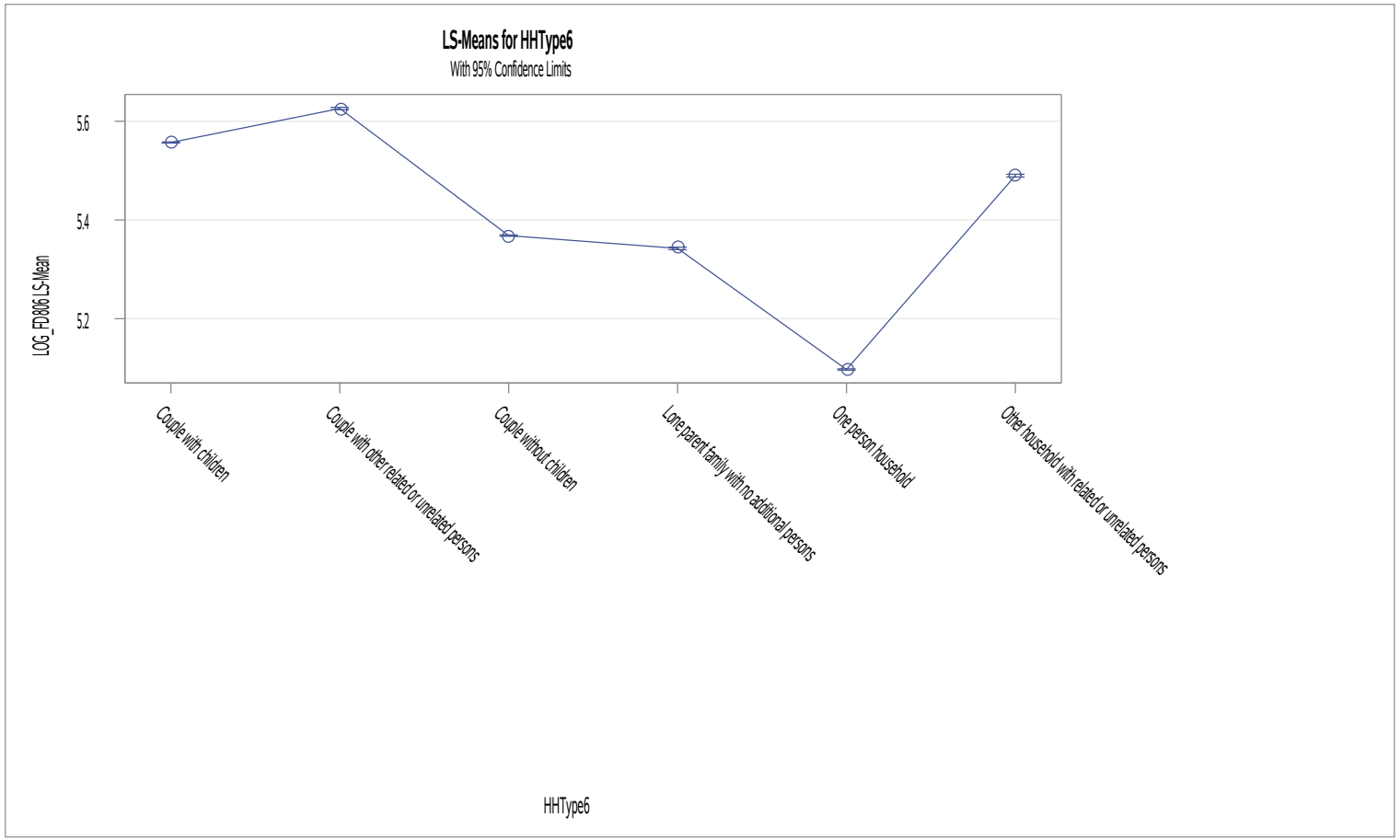
HHType6	LOG_FD806 LSMEAN	LSMEAN Number
Couple with children	5.55694286	1
Couple with other related or unrelated persons	5.62580255	2
Couple without children	5.36827009	3
Lone parent family with no additional persons	5.34240093	4
One person household	5.09706631	5
Other household with related or unrelated persons	5.48983025	6

Least Squares Means for effect HHType6
Pr > |t| for H0: LSMean(i)=LSMean(j)

Dependent Variable: LOG_FD806

i/j	1	2	3	4	5	6
1		<.0001	<.0001	<.0001	<.0001	<.0001
2	<.0001		<.0001	<.0001	<.0001	<.0001
3	<.0001	<.0001		<.0001	<.0001	<.0001
4	<.0001	<.0001	<.0001		<.0001	<.0001
5	<.0001	<.0001	<.0001	<.0001		<.0001
6	<.0001	<.0001	<.0001	<.0001	<.0001	

The GLM Procedure
Least Squares Means
Adjustment for Multiple Comparisons: Tukey-Kramer



The GLM Procedure
Least Squares Means
Adjustment for Multiple Comparisons: Tukey-Kramer