

# The dogs2 data

February 22, 2011

The data:

Morphine	N	-3.22	-1.61	-2.30	-2.53
Morphine	N	-3.91	-2.81	-3.91	-3.91
Morphine	N	-2.66	0.34	-0.73	-1.43
Morphine	N	-1.77	-0.56	-1.05	-1.43
Trimethaphan	N	-3.51	-0.48	-1.17	-1.51
Trimethaphan	N	-3.51	0.05	-0.31	-0.51
Trimethaphan	N	-2.66	-0.19	0.07	-0.22
Trimethaphan	N	-2.41	1.14	0.72	0.21

The SAS code and output:

```
options linesize=75;

data dogs;
  infile "dogs2.dat";
  input Drug $ x $ lh1 lh2 lh3 lh4;
  avg=(lh1+lh2+lh3+lh4)/4;

proc glm;
  class Drug;
  model lh1 lh2 lh3 lh4 = Drug / nouni;
  repeated Time;
  lsmeans Drug;

proc glm;
  class Drug;
  model avg=Drug;
  lsmeans Drug;

run;
```

The GLM Procedure  
Class Level Information

Class	Levels	Values
Drug	2	Morphine Trimetha

Number of Observations Read	8
Number of Observations Used	8

The GLM Procedure

Repeated Measures Analysis of Variance

	Repeated Measures Level Information			
Dependent Variable	lh1	lh2	lh3	lh4
Level of Time	1	2	3	4

MANOVA Test Criteria and Exact F Statistics  
for the Hypothesis of no Time Effect

H = Type III SSCP Matrix for Time

E = Error SSCP Matrix

S=1 M=0.5 N=1

Statistic	Value	F Value	Num DF	Den DF	Pr > F
Wilks' Lambda	0.05012095	25.27	3	4	0.0046
Pillai's Trace	0.94987905	25.27	3	4	0.0046
Hotelling-Lawley Trace	18.95173763	25.27	3	4	0.0046
Roy's Greatest Root	18.95173763	25.27	3	4	0.0046

MANOVA Test Criteria and Exact F Statistics  
for the Hypothesis of no Time\*Drug Effect

H = Type III SSCP Matrix for Time\*Drug

E = Error SSCP Matrix

S=1 M=0.5 N=1

Statistic	Value	F Value	Num DF	Den DF	Pr > F
Wilks' Lambda	0.10523944	11.34	3	4	0.0200
Pillai's Trace	0.89476056	11.34	3	4	0.0200
Hotelling-Lawley Trace	8.50214058	11.34	3	4	0.0200
Roy's Greatest Root	8.50214058	11.34	3	4	0.0200

The GLM Procedure

Repeated Measures Analysis of Variance

Tests of Hypotheses for Between Subjects Effects

Source	DF	Type III SS	Mean Square	F Value	Pr > F
Drug	1	11.52000000	11.52000000	3.13	0.1274
Error	6	22.10263750	3.68377292		

The GLM Procedure

Repeated Measures Analysis of Variance

Univariate Tests of Hypotheses for Within Subject Effects

Source	DF	Type III SS	Mean Square	F Value	Pr > F
Time	3	26.15951250	8.71983750	69.65	<.0001

Time*Drug	3	5.11117500	1.70372500	13.61	<.0001
Error(Time)	18	2.25336250	0.12518681		
	Adj	Pr	> F		
Source	G - G	H-F-L			
Time	<.0001	<.0001			
Time*Drug	0.0023	0.0007			
Error(Time)					

Greenhouse-Geisser Epsilon	0.5262
Huynh-Feldt-Lecoutre Epsilon	0.6823

The GLM Procedure

Least Squares Means

Drug	1h1 LSMEAN	1h2 LSMEAN	1h3 LSMEAN	1h4 LSMEAN
Morphine	-2.89000000	-1.16000000	-1.99750000	-2.32500000
Trimetha	-3.02250000	0.13000000	-0.17250000	-0.50750000

The GLM Procedure

Class Level Information

Class	Levels	Values
Drug	2	Morphine Trimetha

Number of Observations Read	8
Number of Observations Used	8

The GLM Procedure

Dependent Variable: avg

Source	DF	Sum of Squares	Mean Square	F Value	Pr > F
Model	1	2.88000000	2.88000000	3.13	0.1274
Error	6	5.52565938	0.92094323		
Corrected Total	7	8.40565938			

R-Square	Coeff Var	Root MSE	avg Mean
0.342626	-64.27177	0.959658	-1.493125

Source	DF	Type I SS	Mean Square	F Value	Pr > F
Drug	1	2.88000000	2.88000000	3.13	0.1274

Source	DF	Type III SS	Mean Square	F Value	Pr > F
Drug	1	2.88000000	2.88000000	3.13	0.1274

The GLM Procedure

Least Squares Means

Drug	avg LSMEAN
Morphine	-2.09312500

Trimetha      -0.89312500