

The Mixed Procedure

Model Information	
Data Set	WORK.A
Dependent Variable	lead
Covariance Structure	Unstructured
Subject Effect	id
Estimation Method	REML
Residual Variance Method	Profile
Fixed Effects SE Method	Model-Based
Degrees of Freedom Method	Containment

Class Level Information		
Class	Levels	Values
id	100	1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16 17 18 19 20 21 22 23 24 25 26 27 28 29 30 31 32 33 34 35 36 37 38 39 40 41 42 43 44 45 46 47 48 49 50 51 52 53 54 55 56 57 58 59 60 61 62 63 64 65 66 67 68 69 70 71 72 73 74 75 76 77 78 79 80 81 82 83 84 85 86 87 88 89 90 91 92 93 94 95 96 97 98 99 100
group	2	A P
timefactor	4	0 1 4 6

Dimensions	
Covariance Parameters	2
Columns in X	7
Columns in Z per Subject	1
Subjects	100
Max Obs per Subject	4

Number of Observations	
Number of Observations Read	400
Number of Observations Used	400
Number of Observations Not Used	0

Iteration History			
Iteration	Evaluations	-2 Res Log Like	Criterion
0	1	2628.69582475	
1	2	2463.06042278	0.00000000

Convergence criteria met.

## The Mixed Procedure

Estimated G Matrix			
Row	Effect	id	Col1
1	Intercept	1	25.9325

Estimated G Correlation Matrix			
Row	Effect	id	Col1
1	Intercept	1	1.0000

Estimated V Matrix for id 1				
Row	Col1	Col2	Col3	Col4
1	43.6760	25.9325	25.9325	25.9325
2	25.9325	43.6760	25.9325	25.9325
3	25.9325	25.9325	43.6760	25.9325
4	25.9325	25.9325	25.9325	43.6760

Estimated V Correlation Matrix for id 1				
Row	Col1	Col2	Col3	Col4
1	1.0000	0.5937	0.5937	0.5937
2	0.5937	1.0000	0.5937	0.5937
3	0.5937	0.5937	1.0000	0.5937
4	0.5937	0.5937	0.5937	1.0000

Covariance Parameter Estimates		
Cov Parm	Subject	Estimate
UN(1,1)	id	25.9325
Residual		17.7435

Fit Statistics	
-2 Res Log Likelihood	2463.1
AIC (Smaller is Better)	2467.1
AICC (Smaller is Better)	2467.1
BIC (Smaller is Better)	2472.3

## The Mixed Procedure

Null Model Likelihood Ratio Test		
DF	Chi-Square	Pr > ChiSq
1	165.64	<.0001

Solution for Fixed Effects					
Effect	Estimate	Standard Error	DF	t Value	Pr >  t
Intercept	26.4060	0.6609	99	39.96	<.0001
t1	-1.6664	0.7985	294	-2.09	0.0378
t4	-2.2564	0.7985	294	-2.83	0.0050
t6	-2.6804	0.7985	294	-3.36	0.0009
t1*active	-11.2971	1.0636	294	-10.62	<.0001
t4*active	-8.7151	1.0636	294	-8.19	<.0001
t6*active	-3.0431	1.0636	294	-2.86	0.0045

Type 3 Tests of Fixed Effects				
Effect	Num DF	Den DF	F Value	Pr > F
t1	1	294	4.36	0.0378
t4	1	294	7.98	0.0050
t6	1	294	11.27	0.0009
t1*active	1	294	112.83	<.0001
t4*active	1	294	67.15	<.0001
t6*active	1	294	8.19	0.0045

The Mixed Procedure

Model Information	
Data Set	WORK.A
Dependent Variable	lead
Covariance Structure	Unstructured
Subject Effect	id
Estimation Method	ML
Residual Variance Method	Profile
Fixed Effects SE Method	Model-Based
Degrees of Freedom Method	Containment

Class Level Information		
Class	Levels	Values
id	100	1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16 17 18 19 20 21 22 23 24 25 26 27 28 29 30 31 32 33 34 35 36 37 38 39 40 41 42 43 44 45 46 47 48 49 50 51 52 53 54 55 56 57 58 59 60 61 62 63 64 65 66 67 68 69 70 71 72 73 74 75 76 77 78 79 80 81 82 83 84 85 86 87 88 89 90 91 92 93 94 95 96 97 98 99 100
group	2	A P
timefactor	4	0 1 4 6

Dimensions	
Covariance Parameters	2
Columns in X	7
Columns in Z per Subject	1
Subjects	100
Max Obs per Subject	4

Number of Observations	
Number of Observations Read	400
Number of Observations Used	400
Number of Observations Not Used	0

Iteration History			
Iteration	Evaluations	-2 Log Like	Criterion
0	1	2639.87799184	
1	2	2470.86353672	0.00000000

Convergence criteria met.

## The Mixed Procedure

Estimated G Matrix			
Row	Effect	id	Col1
1	Intercept	1	25.6256

Estimated G Correlation Matrix			
Row	Effect	id	Col1
1	Intercept	1	1.0000

Estimated V Matrix for id 1				
Row	Col1	Col2	Col3	Col4
1	43.0313	25.6256	25.6256	25.6256
2	25.6256	43.0313	25.6256	25.6256
3	25.6256	25.6256	43.0313	25.6256
4	25.6256	25.6256	25.6256	43.0313

Estimated V Correlation Matrix for id 1				
Row	Col1	Col2	Col3	Col4
1	1.0000	0.5955	0.5955	0.5955
2	0.5955	1.0000	0.5955	0.5955
3	0.5955	0.5955	1.0000	0.5955
4	0.5955	0.5955	0.5955	1.0000

Covariance Parameter Estimates		
Cov Parm	Subject	Estimate
UN(1,1)	id	25.6256
Residual		17.4057

Fit Statistics	
-2 Log Likelihood	2470.9
AIC (Smaller is Better)	2488.9
AICC (Smaller is Better)	2489.3
BIC (Smaller is Better)	2512.3

## The Mixed Procedure

Null Model Likelihood Ratio Test		
DF	Chi-Square	Pr > ChiSq
1	169.01	<.0001

Solution for Fixed Effects					
Effect	Estimate	Standard Error	DF	t Value	Pr >  t
Intercept	26.4060	0.6560	99	40.25	<.0001
t1	-1.6662	0.7911	294	-2.11	0.0360
t4	-2.2562	0.7911	294	-2.85	0.0047
t6	-2.6802	0.7911	294	-3.39	0.0008
t1*active	-11.2976	1.0540	294	-10.72	<.0001
t4*active	-8.7156	1.0540	294	-8.27	<.0001
t6*active	-3.0436	1.0540	294	-2.89	0.0042

Type 3 Tests of Fixed Effects				
Effect	Num DF	Den DF	F Value	Pr > F
t1	1	294	4.44	0.0360
t4	1	294	8.13	0.0047
t6	1	294	11.48	0.0008
t1*active	1	294	114.90	<.0001
t4*active	1	294	68.38	<.0001
t6*active	1	294	8.34	0.0042

The Mixed Procedure

Model Information	
Data Set	WORK.A
Dependent Variable	lead
Covariance Structure	Compound Symmetry
Subject Effect	id
Estimation Method	REML
Residual Variance Method	Profile
Fixed Effects SE Method	Model-Based
Degrees of Freedom Method	Between-Within

Class Level Information		
Class	Levels	Values
id	100	1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16 17 18 19 20 21 22 23 24 25 26 27 28 29 30 31 32 33 34 35 36 37 38 39 40 41 42 43 44 45 46 47 48 49 50 51 52 53 54 55 56 57 58 59 60 61 62 63 64 65 66 67 68 69 70 71 72 73 74 75 76 77 78 79 80 81 82 83 84 85 86 87 88 89 90 91 92 93 94 95 96 97 98 99 100
group	2	A P
timefactor	4	0 1 4 6

Dimensions	
Covariance Parameters	2
Columns in X	7
Columns in Z	0
Subjects	100
Max Obs per Subject	4

Number of Observations	
Number of Observations Read	400
Number of Observations Used	400
Number of Observations Not Used	0

Iteration History			
Iteration	Evaluations	-2 Res Log Like	Criterion
0	1	2628.69582475	
1	2	2463.06042278	0.00000000

Convergence criteria met.

## The Mixed Procedure

Estimated R Matrix for id 1				
Row	Col1	Col2	Col3	Col4
1	43.6760	25.9325	25.9325	25.9325
2	25.9325	43.6760	25.9325	25.9325
3	25.9325	25.9325	43.6760	25.9325
4	25.9325	25.9325	25.9325	43.6760

Estimated R Correlation Matrix for id 1				
Row	Col1	Col2	Col3	Col4
1	1.0000	0.5937	0.5937	0.5937
2	0.5937	1.0000	0.5937	0.5937
3	0.5937	0.5937	1.0000	0.5937
4	0.5937	0.5937	0.5937	1.0000

Covariance Parameter Estimates		
Cov Parm	Subject	Estimate
CS	id	25.9325
Residual		17.7435

Fit Statistics	
-2 Res Log Likelihood	2463.1
AIC (Smaller is Better)	2467.1
AICC (Smaller is Better)	2467.1
BIC (Smaller is Better)	2472.3

Null Model Likelihood Ratio Test		
DF	Chi-Square	Pr > ChiSq
1	165.64	<.0001

Solution for Fixed Effects					
Effect	Estimate	Standard Error	DF	t Value	Pr >  t
Intercept	26.4060	0.6609	99	39.96	<.0001
t1	-1.6664	0.7985	294	-2.09	0.0378
t4	-2.2564	0.7985	294	-2.83	0.0050
t6	-2.6804	0.7985	294	-3.36	0.0009



The Mixed Procedure

Solution for Fixed Effects					
Effect	Estimate	Standard Error	DF	t Value	Pr >  t
t1*active	-11.2971	1.0636	294	-10.62	<.0001
t4*active	-8.7151	1.0636	294	-8.19	<.0001
t6*active	-3.0431	1.0636	294	-2.86	0.0045

Type 3 Tests of Fixed Effects				
Effect	Num DF	Den DF	F Value	Pr > F
t1	1	294	4.36	0.0378
t4	1	294	7.98	0.0050
t6	1	294	11.27	0.0009
t1*active	1	294	112.83	<.0001
t4*active	1	294	67.15	<.0001
t6*active	1	294	8.19	0.0045

The Mixed Procedure

Model Information	
Data Set	WORK.A
Dependent Variable	lead
Covariance Structure	Compound Symmetry
Subject Effect	id
Estimation Method	ML
Residual Variance Method	Profile
Fixed Effects SE Method	Model-Based
Degrees of Freedom Method	Between-Within

Class Level Information		
Class	Levels	Values
id	100	1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16 17 18 19 20 21 22 23 24 25 26 27 28 29 30 31 32 33 34 35 36 37 38 39 40 41 42 43 44 45 46 47 48 49 50 51 52 53 54 55 56 57 58 59 60 61 62 63 64 65 66 67 68 69 70 71 72 73 74 75 76 77 78 79 80 81 82 83 84 85 86 87 88 89 90 91 92 93 94 95 96 97 98 99 100
group	2	A P
timefactor	4	0 1 4 6

Dimensions	
Covariance Parameters	2
Columns in X	7
Columns in Z	0
Subjects	100
Max Obs per Subject	4

Number of Observations	
Number of Observations Read	400
Number of Observations Used	400
Number of Observations Not Used	0

Iteration History			
Iteration	Evaluations	-2 Log Like	Criterion
0	1	2639.87799184	
1	2	2470.86353672	0.00000000

Convergence criteria met.

## The Mixed Procedure

Estimated R Matrix for id 1				
Row	Col1	Col2	Col3	Col4
1	43.0313	25.6256	25.6256	25.6256
2	25.6256	43.0313	25.6256	25.6256
3	25.6256	25.6256	43.0313	25.6256
4	25.6256	25.6256	25.6256	43.0313

Estimated R Correlation Matrix for id 1				
Row	Col1	Col2	Col3	Col4
1	1.0000	0.5955	0.5955	0.5955
2	0.5955	1.0000	0.5955	0.5955
3	0.5955	0.5955	1.0000	0.5955
4	0.5955	0.5955	0.5955	1.0000

Covariance Parameter Estimates		
Cov Parm	Subject	Estimate
CS	id	25.6256
Residual		17.4057

Fit Statistics	
-2 Log Likelihood	2470.9
AIC (Smaller is Better)	2488.9
AICC (Smaller is Better)	2489.3
BIC (Smaller is Better)	2512.3

Null Model Likelihood Ratio Test		
DF	Chi-Square	Pr > ChiSq
1	169.01	<.0001

Solution for Fixed Effects					
Effect	Estimate	Standard Error	DF	t Value	Pr >  t
Intercept	26.4060	0.6560	99	40.25	<.0001
t1	-1.6662	0.7911	294	-2.11	0.0360
t4	-2.2562	0.7911	294	-2.85	0.0047
t6	-2.6802	0.7911	294	-3.39	0.0008

The Mixed Procedure

Solution for Fixed Effects					
Effect	Estimate	Standard Error	DF	t Value	Pr >  t
t1*active	-11.2976	1.0540	294	-10.72	<.0001
t4*active	-8.7156	1.0540	294	-8.27	<.0001
t6*active	-3.0436	1.0540	294	-2.89	0.0042

Type 3 Tests of Fixed Effects				
Effect	Num DF	Den DF	F Value	Pr > F
t1	1	294	4.44	0.0360
t4	1	294	8.13	0.0047
t6	1	294	11.48	0.0008
t1*active	1	294	114.90	<.0001
t4*active	1	294	68.38	<.0001
t6*active	1	294	8.34	0.0042

The GENMOD Procedure

Model Information		
Data Set	WORK.A	
Distribution	Normal	
Link Function	Identity	
Dependent Variable	lead	Blood lead level (ug/dL)

Number of Observations Read	400
Number of Observations Used	400

Class Level Information		
Class	Levels	Values
id	100	1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16 17 18 19 20 21 22 23 24 25 26 27 28 29 30 31 32 33 34 35 36 37 38 39 40 41 42 43 44 45 46 47 48 49 50 51 52 53 54 55 56 57 58 59 60 61 62 63 64 65 66 67 68 69 70 71 72 73 74 75 76 77 78 79 80 81 82 83 84 85 86 87 ...
group	2	A P
timefactor	4	0 1 4 6

Parameter Information	
Parameter	Effect
Prm1	Intercept
Prm2	t1
Prm3	t4
Prm4	t6
Prm5	t1*active
Prm6	t4*active
Prm7	t6*active

Algorithm converged.

GEE Model Information	
Correlation Structure	Exchangeable
Within-Subject Effect	timefactor (4 levels)
Subject Effect	id (100 levels)
Number of Clusters	100
Correlation Matrix Dimension	4
Maximum Cluster Size	4
Minimum Cluster Size	4

## The GENMOD Procedure

Algorithm converged.

### Exchangeable Working Correlation

Correlation	0.5919944613
-------------	--------------

### GEE Fit Criteria

QIC	405.5438
QICu	407.0000

### Analysis Of GEE Parameter Estimates

#### Empirical Standard Error Estimates

Parameter	Estimate	Standard Error	95% Confidence Limits		Z	Pr >  Z
Intercept	26.4060	0.4974	25.4311	27.3809	53.09	<.0001
t1	-1.6667	0.4569	-2.5622	-0.7711	-3.65	0.0003
t4	-2.2567	0.4752	-3.1880	-1.3254	-4.75	<.0001
t6	-2.6807	0.5378	-3.7347	-1.6267	-4.98	<.0001
t1*active	-11.2967	1.0946	-13.4420	-9.1513	-10.32	<.0001
t4*active	-8.7147	1.1355	-10.9403	-6.4890	-7.67	<.0001
t6*active	-3.0427	1.2709	-5.5336	-0.5517	-2.39	0.0167

### Analysis Of GEE Parameter Estimates

#### Model-Based Standard Error Estimates

Parameter	Estimate	Standard Error	95% Confidence Limits		Z	Pr >  Z
Intercept	26.4060	0.6618	25.1089	27.7031	39.90	<.0001
t1	-1.6667	0.8012	-3.2369	-0.0964	-2.08	0.0375
t4	-2.2567	0.8012	-3.8269	-0.6864	-2.82	0.0049
t6	-2.6807	0.8012	-4.2509	-1.1104	-3.35	0.0008
t1*active	-11.2967	1.0667	-13.3874	-9.2059	-10.59	<.0001
t4*active	-8.7147	1.0667	-10.8054	-6.6239	-8.17	<.0001
t6*active	-3.0427	1.0667	-5.1334	-0.9519	-2.85	0.0043
Scale	6.6180	.	.	.	.	.

**Note:** The scale parameter for GEE estimation was computed as the square root of the normalized Pearson's chi-square.

6. A non-identifiable model

The Mixed Procedure

Model Information	
Data Set	WORK.A
Dependent Variable	lead
Covariance Structures	Unstructured, Compound Symmetry
Subject Effects	id, id
Estimation Method	REML
Residual Variance Method	Profile
Fixed Effects SE Method	Model-Based
Degrees of Freedom Method	Containment

Class Level Information		
Class	Levels	Values
id	100	1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16 17 18 19 20 21 22 23 24 25 26 27 28 29 30 31 32 33 34 35 36 37 38 39 40 41 42 43 44 45 46 47 48 49 50 51 52 53 54 55 56 57 58 59 60 61 62 63 64 65 66 67 68 69 70 71 72 73 74 75 76 77 78 79 80 81 82 83 84 85 86 87 88 89 90 91 92 93 94 95 96 97 98 99 100
group	2	A P
timefactor	4	0 1 4 6

Dimensions	
Covariance Parameters	3
Columns in X	7
Columns in Z per Subject	1
Subjects	100
Max Obs per Subject	4

Number of Observations	
Number of Observations Read	400
Number of Observations Used	400
Number of Observations Not Used	0

Iteration History			
Iteration	Evaluations	-2 Res Log Like	Criterion
0	1	2628.69582475	
1	2	2463.06044002	0.00000110
2	1	2463.06042108	0.00000000

Convergence criteria met but final hessian is not positive definite.

## The Mixed Procedure

Estimated R Matrix for id 1				
Row	Col1	Col2	Col3	Col4
1	17.5753	-0.1673	-0.1673	-0.1673
2	-0.1673	17.5753	-0.1673	-0.1673
3	-0.1673	-0.1673	17.5753	-0.1673
4	-0.1673	-0.1673	-0.1673	17.5753

Estimated R Correlation Matrix for id 1				
Row	Col1	Col2	Col3	Col4
1	1.0000	-0.00952	-0.00952	-0.00952
2	-0.00952	1.0000	-0.00952	-0.00952
3	-0.00952	-0.00952	1.0000	-0.00952
4	-0.00952	-0.00952	-0.00952	1.0000

Estimated G Matrix			
Row	Effect	id	Col1
1	Intercept	1	26.1051

Estimated G Correlation Matrix			
Row	Effect	id	Col1
1	Intercept	1	1.0000

Estimated V Matrix for id 1				
Row	Col1	Col2	Col3	Col4
1	43.6803	25.9378	25.9378	25.9378
2	25.9378	43.6803	25.9378	25.9378
3	25.9378	25.9378	43.6803	25.9378
4	25.9378	25.9378	25.9378	43.6803

Estimated V Correlation Matrix for id 1				
Row	Col1	Col2	Col3	Col4
1	1.0000	0.5938	0.5938	0.5938
2	0.5938	1.0000	0.5938	0.5938
3	0.5938	0.5938	1.0000	0.5938
4	0.5938	0.5938	0.5938	1.0000



## The Mixed Procedure

Covariance Parameter Estimates		
Cov Parm	Subject	Estimate
UN(1,1)	id	26.1051
CS	id	-0.1673
Residual		17.7426

Fit Statistics	
-2 Res Log Likelihood	2463.1
AIC (Smaller is Better)	2469.1
AICC (Smaller is Better)	2469.1
BIC (Smaller is Better)	2476.9

Null Model Likelihood Ratio Test		
DF	Chi-Square	Pr > ChiSq
2	165.64	<.0001

Solution for Fixed Effects					
Effect	Estimate	Standard Error	DF	t Value	Pr >  t
Intercept	26.4060	0.6609	99	39.95	<.0001
t1	-1.6664	0.7985	294	-2.09	0.0378
t4	-2.2564	0.7985	294	-2.83	0.0050
t6	-2.6804	0.7985	294	-3.36	0.0009
t1*active	-11.2971	1.0635	294	-10.62	<.0001
t4*active	-8.7151	1.0635	294	-8.19	<.0001
t6*active	-3.0431	1.0635	294	-2.86	0.0045

Type 3 Tests of Fixed Effects				
Effect	Num DF	Den DF	F Value	Pr > F
t1	1	294	4.36	0.0378
t4	1	294	7.98	0.0050
t6	1	294	11.27	0.0009
t1*active	1	294	112.83	<.0001
t4*active	1	294	67.15	<.0001
t6*active	1	294	8.19	0.0045