

BIOS6643. HW4 - Solution

Question 1

In previous lectures, we talked about how including multiple random effects can induce a covariance structure that is time sensitive. Show this by considering a simple data set and model.

Let times be $t = 0, 1, 2$, and consider a model that includes a random intercept and slope for time by subject, plus covariance between them (i.e., UN structure in \mathbf{G}). Show that it is possible to obtain $Cov[Y_{i1}, Y_{i2}] > Cov[Y_{i1}, Y_{i3}]$, and $Cov[Y_{i1}, Y_{i3}] < Cov[Y_{i2}, Y_{i3}]$, i.e., decaying covariance as distance between time points is increased. For what covariance parameter values will these hold? Interpret the results.

$$\begin{aligned}
 \mathbf{V}_i &= \mathbf{Z}_i \mathbf{G}_i \mathbf{Z}_i^t + \mathbf{R}_i \\
 &= \begin{bmatrix} 1 & 0 \\ 1 & 1 \\ 1 & 2 \end{bmatrix} \begin{bmatrix} \sigma_0^2 & \sigma_{01} \\ \sigma_{01} & \sigma_1^2 \end{bmatrix} \begin{bmatrix} 1 & 1 & 1 \\ 0 & 1 & 2 \end{bmatrix} + \begin{bmatrix} \sigma_\epsilon^2 & 0 & 0 \\ 0 & \sigma_\epsilon^2 & 0 \\ 0 & 0 & \sigma_\epsilon^2 \end{bmatrix} \\
 &= \begin{bmatrix} \sigma_0^2 & \sigma_{01} \\ \sigma_0^2 + \sigma_{01} & \sigma_{01} + \sigma_1^2 \\ \sigma_0^2 + 2\sigma_{01} & \sigma_{01} + 2\sigma_1^2 \end{bmatrix} \begin{bmatrix} 1 & 1 & 1 \\ 0 & 1 & 2 \end{bmatrix} + \begin{bmatrix} \sigma_\epsilon^2 & 0 & 0 \\ 0 & \sigma_\epsilon^2 & 0 \\ 0 & 0 & \sigma_\epsilon^2 \end{bmatrix} \\
 &= \begin{bmatrix} \sigma_0^2 & \sigma_0^2 + \sigma_{01} & \sigma_0^2 + 2\sigma_{01} \\ \sigma_0^2 + \sigma_{01} & \sigma_0^2 + 2\sigma_{01} + \sigma_1^2 & \sigma_0^2 + 3\sigma_{01} + 2\sigma_1^2 \\ \sigma_0^2 + 2\sigma_{01} & \sigma_0^2 + 3\sigma_{01} + 2\sigma_1^2 & \sigma_0^2 + 4\sigma_{01} + 4\sigma_1^2 \end{bmatrix} + \begin{bmatrix} \sigma_\epsilon^2 & 0 & 0 \\ 0 & \sigma_\epsilon^2 & 0 \\ 0 & 0 & \sigma_\epsilon^2 \end{bmatrix} \\
 &= \begin{bmatrix} \sigma_0^2 + \sigma_\epsilon^2 & \sigma_0^2 + \sigma_{01} & \sigma_0^2 + 2\sigma_{01} \\ \sigma_0^2 + \sigma_{01} & \sigma_0^2 + 2\sigma_{01} + \sigma_1^2 + \sigma_\epsilon^2 & \sigma_0^2 + 3\sigma_{01} + 2\sigma_1^2 \\ \sigma_0^2 + 2\sigma_{01} & \sigma_0^2 + 3\sigma_{01} + 2\sigma_1^2 & \sigma_0^2 + 4\sigma_{01} + 4\sigma_1^2 + \sigma_\epsilon^2 \end{bmatrix}
 \end{aligned}$$

$$Cov(Y_{i1}, Y_{i3}) < Cov(Y_{i1}, Y_{i2}) \implies \sigma_0^2 + 2\sigma_{01} < \sigma_0^2 + \sigma_{01} \implies \sigma_{01} < 0$$

$$Cov(Y_{i1}, Y_{i3}) < Cov(Y_{i2}, Y_{i3}) \implies \sigma_0^2 + 2\sigma_{01} < \sigma_0^2 + 3\sigma_{01} + 2\sigma_1^2 \implies -\sigma_{01} < 2\sigma_1^2$$

We could get the decay pattern when $-2\sigma_1^2 < \sigma_{01} < 0$.

Question 3

Consider a hierarchical study of 3 levels where children are sampled from schools, and then measured over time. We will include a random intercept for schools and a random intercept for subjects within schools, but simple \mathbf{R} ($\sigma\mathbf{I}$). Similarly to how we can specify the \mathbf{V}_i for children, we could also specify this covariance matrix for schools \mathbf{V}_h . Determine the marginal covariance matrix \mathbf{V}_h (matrix of 8×8) for the subset of 3 individuals in a given school h if the first two kids have 3 measures and the last kid has 2. You might start by writing the model for outcome Y_{hij} and determining the design matrix for the random effects. You may write a generic form of the fixed-effect part of the model.

Not to turn in: how would \mathbf{V}_h change if we had more measures for subjects and employed the AR(1) structure for \mathbf{R}_i (the error covariance structure for subject i within school h)?

SOLUTION:

What are the assumptions for this question?

First, we look at the mean functions at different levels: As $School(h) \rightarrow Class(i) \rightarrow Students(j) \rightarrow repeated\ measures\ (k)$

From the lowest level, for a given certain student within a given class of a given school with one measurement.

$$y_{hijk} = x_{hij(k)}\boldsymbol{\beta} + b_h + b_{i(h)} + \epsilon_{hijk}$$

$$b_h \sim N(0, \sigma_1^2)$$

$$b_{i(h)} \sim N(0, \sigma_2^2)$$

$$\epsilon_{hijk} \sim N(0, \sigma_\epsilon^2)$$

The second level, we look at one student's several measurements. Now we have the outcome as a vector of K repeated measurements. $\{c\}$ means we store all the element to form one column, hence \mathbf{Y}_{hij} has the dimension of $K \times 1$.

$$\mathbf{Y}_{hij} = \{c\ y_{hijk}\}_{k=1}^K$$

$$\boldsymbol{\epsilon}_{hij} = \{c\ \epsilon_{hijk}\}_{k=1}^K$$

$$\mathbf{Y}_{hij} = \mathbf{X}_{hij}\boldsymbol{\beta} + b_h\mathbf{1}_{(K \times 1)} + b_{i(h)}\mathbf{1}_{(K \times 1)} + \boldsymbol{\epsilon}_{hij}$$

The marginal aka the fixed population mean effect; The average of all the sample population.

$$\mathbf{X}_{hij}\boldsymbol{\beta}$$

Conditional on school level mean effect ; The average of a given school:

$$\mathbf{X}_{hij}\boldsymbol{\beta} + b_h$$

The conditional on class level mean effect; The average of a given class of a given school:

$$\mathbf{X}_{hij}\boldsymbol{\beta} + b_h + b_{i(h)}$$

The marginal covariance function V_h has the following form.

$$\mathbf{V}_h = \mathbf{Z}_h \mathbf{G}_h \mathbf{Z}_h^t + \mathbf{R}_h$$

[illegible]

Question 2

Suppose you are working with a principal investigator (PI) of the geriatrics group at CU Anschutz and she wants to study the effect of sleep deprivation on bone formation. One of the bone formation biomarkers she will study is procollagen type 1 n-terminal propeptide (P1NP). She has conducted a pilot study to answer this question and has collected data at two different days: day1=baseline and day6=post-intervention 6 days after baseline. Thirty subjects were exposed to sleep deprivation (intervention) after day 1. Profiles for 24 hours of P1NP were obtained every two hours at baseline and after the intervention. The data are available in the `p1np.csv` file.

SOLUTION

- a. Use *day* and *time* (indexing the 13 profiles within 24 hours) as categorical variables and consider the interaction between them. Determine a Kronecker Product structure that will work for these data. Note: there are 3 options in SAS, and you may be limited by what will work. Do not include any random effects. Select and comment on the most appropriate model.

Note the model has been parameterized as 'day + day:time' so that the mean estimates for day 1 and day 2 at every time point are obtained easily from the model. AIC values are 6376.7 and 6355.3 for UN@AR(1) and UN@CS, respectively. Thus, the UN@CS structure is a better fit (BIC values agree with this too). See output below.

- b. Obtain the covariance and correlation forms of the \mathbf{V}_i matrix. In 3-4 sentences, interpret the correlations and variances in the data; comment on the relationship of \mathbf{V}_i with the correlation structure of the errors (\mathbf{R} matrix).

Since we are only specifying the R structure, the $\mathbf{V}_i = \mathbf{R}_i$. The unstructured form of the variance-covariance matrix for days allows for a different variance for day 1 and day 6 (across all time measurements) as well as for a non-zero correlation between time measurements in day 1 with those in day 6. The UN@AR(1) structure allows for correlations within a day to be less correlated as they are further apart. The correlations within a day are pretty low. The UN@CS is assuming the same correlation within a day for any two time points (0.18), the same correlation between any two time points with different indices (taken at different times) of different days (0.024; e.g. day 1 time 1 and day 6 time 2), and the same correlation between time points with the same indices (0.13; e.g. day 1 time 1 and day 6 time 1). See output below.

- c. Compare your model in **a** to a model that includes a random intercept for subjects. Comment on the differences.

A LMM with only random intercepts seems to work well for the data. The AIC is 6331.5, which is lower than the AIC of models in **a**. Perhaps the correlations are low in this particular dataset, so it does not need the flexibility of the kronecker product. In practice, this might not be the case.

- d. Model time as continuous variable (modify model **a**, but keep the kronecker product). In order to get this to work, in SAS you need to define a second *timec* variable that is identical to *time* (e.g., add `timec=time` in the data step). Use 'timec' in the model statement, and 'time' in the class and repeated statements. Consider 1st and second degree polynomial time models, including the interactions of polynomials of time with *day* (e.g. `day*timec2`). Compare the AIC's for these models.

The AIC is lower based on the model with quadratic terms for time (6329.6) versus the AIC based on model with only linear trends (6366.9). Note that to compare these models we could use likelihood ratio test because models are nested; this corresponds to the Type 3 anova tests; result of this test is consistent with our conclusion ($p < 0.0001$). e. With your optimal model found in part **d**, go back to `method=REML` and conduct a custom test for interaction between the 2 treatments. Interpret and highlight results.

To test for the interaction between time and day, we need to test that there are no differences in the coefficients of time and time² for both days. The custom test shows that there are differences in trends of time across days ($F=130.53$, $Pvalue < 0.0001$).

```

proc import DATAFILE='C:\Users\juarezce\OneDrive - The University of Colorado Denver\BIOS6643\BIOS6643_
  replace out=dat0 dbms=csv; run;

data dat;
  set dat0;
  timec=time; **timec will be used as continuous;
run;

proc print data=dat(obs=2);run;

*Model with UN@UN did not converge ;
/*
title 'Model with kronecker product - UN@UN';

proc mixed method=ml data=dat;
class id day(ref='1') time(ref='1');
model p1np = day time day*time / solution;
  repeated day time/ subject=id type=UN@UN r rcorr;

ods select ParameterEstimates;
ods trace on; ods show;

run;
*/

title 'Model with kronecker product - UN@AR(1)';

proc mixed method=ml data=dat;
class id day(ref='1') time(ref='1');
model p1np = day day*time /noint solution;
  repeated day time/ subject=id type=un@ar(1) r rcorr;
run;

title 'Model with kronecker product - UN@CS';

proc mixed method=ml data=dat;
class id day(ref='1') time(ref='1');
model p1np = day day*time /noint solution;
  repeated day time/ subject=id type=un@CS r rcorr;
run;

/*
title 'Model with kronecker product - UN@AR(1)';

proc mixed method=ml data=dat;
class id day(ref='1') time(ref='1');
model p1np = day time day*time / solution;
  repeated day time/ subject=id type=un@ar(1) r rcorr;
run;

```

```

title 'Model with kronecker product - UN@CS';

proc mixed method=ml data=dat;
class id day(ref='1') time(ref='1');
model p1np = day time day*time / solution;
  repeated day time/ subject=id type=un@CS r rcorr;
run;
*/

title 'Model 2 with random intercepts';
proc mixed method=ml data=dat;
class id day(ref='1') time(ref='1');
model p1np = day day*time /noint solution;
  random intercept / solution type=un subject=id g gcorr v vcorr;
run;

title 'Model 3a - treating time as continuous, fitting time';
proc mixed method=ml data=dat;
class id day time;
model p1np = day day*timec / noint solution;
  repeated day time/ subject=id type=un@CS;

run;

title 'Model 3b - treating time as continuous, fitting time^2';
proc mixed method=reml data=dat;
class id day time;
model p1np = day day*timec day*timec*timec/ noint solution;
  repeated day time/ subject=id type=un@CS;
  contrast 'no interaction between time and day' timec*day 1 -1,
    timec*timec*day 1 -1;

run;

/*****
*****/

Obs          id          day          time          p1np    timec
1             1             1             1          49.7      1
2             1             1             2          47.3      2

```

Model with kronecker product - UN@AR(1)

The Mixed Procedure

Model Information

Data Set

WORK.DAT

Dependent Variable	p1np
Covariance Structure	Unstructured @ Autoregressive
Subject Effect	id
Estimation Method	ML
Residual Variance Method	None
Fixed Effects SE Method	Model-Based
Degrees of Freedom Method	Between-Within

Class Level Information

Class	Levels	Values
id	30	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
day	2	6 1
time	13	2 3 4 5 6 7 8 9 10 11 12 13 1

Dimensions

Covariance Parameters	4
Columns in X	28
Columns in Z	0
Subjects	30
Max Obs per Subject	26

Number of Observations

Number of Observations Read	780
Number of Observations Used	780
Number of Observations Not Used	0

Iteration History

Iteration	Evaluations	-2 Log Like	Criterion
0	1	6390.44089023	
1	2	6316.92963617	0.00010958
2	1	6316.65316739	0.00000031
3	1	6316.65241678	0.00000000

Convergence criteria met.

Estimated R Matrix for id 1

Row	Col1	Col2	Col3	Col4	Col5	Col6	Col7
1	211.42	0.000014	0.000057	0.000224	0.000888	0.003514	0.01391
2	0.000014	211.42	53.4227	13.4990	3.4110	0.8619	0.2178
3	0.000057	53.4227	211.42	53.4227	13.4990	3.4110	0.8619
4	0.000224	13.4990	53.4227	211.42	53.4227	13.4990	3.4110
5	0.000888	3.4110	13.4990	53.4227	211.42	53.4227	13.4990
6	0.003514	0.8619	3.4110	13.4990	53.4227	211.42	53.4227

7	0.01391	0.2178	0.8619	3.4110	13.4990	53.4227	211.42
8	0.05503	0.05503	0.2178	0.8619	3.4110	13.4990	53.4227
9	0.2178	0.01391	0.05503	0.2178	0.8619	3.4110	13.4990
10	0.8619	0.003514	0.01391	0.05503	0.2178	0.8619	3.4110
11	3.4110	0.000888	0.003514	0.01391	0.05503	0.2178	0.8619
12	13.4990	0.000224	0.000888	0.003514	0.01391	0.05503	0.2178
13	53.4227	0.000057	0.000224	0.000888	0.003514	0.01391	0.05503
14	35.3179	2.393E-6	9.47E-6	0.000037	0.000148	0.000587	0.002323
15	2.393E-6	35.3179	8.9243	2.2550	0.5698	0.1440	0.03638
16	9.47E-6	8.9243	35.3179	8.9243	2.2550	0.5698	0.1440
17	0.000037	2.2550	8.9243	35.3179	8.9243	2.2550	0.5698
18	0.000148	0.5698	2.2550	8.9243	35.3179	8.9243	2.2550
19	0.000587	0.1440	0.5698	2.2550	8.9243	35.3179	8.9243
20	0.002323	0.03638	0.1440	0.5698	2.2550	8.9243	35.3179
21	0.009193	0.009193	0.03638	0.1440	0.5698	2.2550	8.9243
22	0.03638	0.002323	0.009193	0.03638	0.1440	0.5698	2.2550
23	0.1440	0.000587	0.002323	0.009193	0.03638	0.1440	0.5698
24	0.5698	0.000148	0.000587	0.002323	0.009193	0.03638	0.1440
25	2.2550	0.000037	0.000148	0.000587	0.002323	0.009193	0.03638
26	8.9243	9.47E-6	0.000037	0.000148	0.000587	0.002323	0.009193

Estimated R Matrix for id 1

Row	Col8	Col9	Col10	Col11	Col12	Col13	Col14
1	0.05503	0.2178	0.8619	3.4110	13.4990	53.4227	35.3179
2	0.05503	0.01391	0.003514	0.000888	0.000224	0.000057	2.393E-6
3	0.2178	0.05503	0.01391	0.003514	0.000888	0.000224	9.47E-6
4	0.8619	0.2178	0.05503	0.01391	0.003514	0.000888	0.000037
5	3.4110	0.8619	0.2178	0.05503	0.01391	0.003514	0.000148
6	13.4990	3.4110	0.8619	0.2178	0.05503	0.01391	0.000587
7	53.4227	13.4990	3.4110	0.8619	0.2178	0.05503	0.002323
8	211.42	53.4227	13.4990	3.4110	0.8619	0.2178	0.009193
9	53.4227	211.42	53.4227	13.4990	3.4110	0.8619	0.03638
10	13.4990	53.4227	211.42	53.4227	13.4990	3.4110	0.1440
11	3.4110	13.4990	53.4227	211.42	53.4227	13.4990	0.5698
12	0.8619	3.4110	13.4990	53.4227	211.42	53.4227	2.2550
13	0.2178	0.8619	3.4110	13.4990	53.4227	211.42	8.9243
14	0.009193	0.03638	0.1440	0.5698	2.2550	8.9243	203.99
15	0.009193	0.002323	0.000587	0.000148	0.000037	9.47E-6	0.000014
16	0.03638	0.009193	0.002323	0.000587	0.000148	0.000037	0.000055
17	0.1440	0.03638	0.009193	0.002323	0.000587	0.000148	0.000216
18	0.5698	0.1440	0.03638	0.009193	0.002323	0.000587	0.000857
19	2.2550	0.5698	0.1440	0.03638	0.009193	0.002323	0.003390
20	8.9243	2.2550	0.5698	0.1440	0.03638	0.009193	0.01342
21	35.3179	8.9243	2.2550	0.5698	0.1440	0.03638	0.05310
22	8.9243	35.3179	8.9243	2.2550	0.5698	0.1440	0.2101
23	2.2550	8.9243	35.3179	8.9243	2.2550	0.5698	0.8316
24	0.5698	2.2550	8.9243	35.3179	8.9243	2.2550	3.2911
25	0.1440	0.5698	2.2550	8.9243	35.3179	8.9243	13.0247
26	0.03638	0.1440	0.5698	2.2550	8.9243	35.3179	51.5456

Estimated R Matrix for id 1

Row	Col15	Col16	Col17	Col18	Col19	Col20	Col21
1	2.393E-6	9.47E-6	0.000037	0.000148	0.000587	0.002323	0.009193
2	35.3179	8.9243	2.2550	0.5698	0.1440	0.03638	0.009193
3	8.9243	35.3179	8.9243	2.2550	0.5698	0.1440	0.03638
4	2.2550	8.9243	35.3179	8.9243	2.2550	0.5698	0.1440
5	0.5698	2.2550	8.9243	35.3179	8.9243	2.2550	0.5698
6	0.1440	0.5698	2.2550	8.9243	35.3179	8.9243	2.2550
7	0.03638	0.1440	0.5698	2.2550	8.9243	35.3179	8.9243
8	0.009193	0.03638	0.1440	0.5698	2.2550	8.9243	35.3179
9	0.002323	0.009193	0.03638	0.1440	0.5698	2.2550	8.9243
10	0.000587	0.002323	0.009193	0.03638	0.1440	0.5698	2.2550
11	0.000148	0.000587	0.002323	0.009193	0.03638	0.1440	0.5698
12	0.000037	0.000148	0.000587	0.002323	0.009193	0.03638	0.1440
13	9.47E-6	0.000037	0.000148	0.000587	0.002323	0.009193	0.03638
14	0.000014	0.000055	0.000216	0.000857	0.003390	0.01342	0.05310
15	203.99	51.5456	13.0247	3.2911	0.8316	0.2101	0.05310
16	51.5456	203.99	51.5456	13.0247	3.2911	0.8316	0.2101
17	13.0247	51.5456	203.99	51.5456	13.0247	3.2911	0.8316
18	3.2911	13.0247	51.5456	203.99	51.5456	13.0247	3.2911
19	0.8316	3.2911	13.0247	51.5456	203.99	51.5456	13.0247
20	0.2101	0.8316	3.2911	13.0247	51.5456	203.99	51.5456
21	0.05310	0.2101	0.8316	3.2911	13.0247	51.5456	203.99
22	0.01342	0.05310	0.2101	0.8316	3.2911	13.0247	51.5456
23	0.003390	0.01342	0.05310	0.2101	0.8316	3.2911	13.0247
24	0.000857	0.003390	0.01342	0.05310	0.2101	0.8316	3.2911
25	0.000216	0.000857	0.003390	0.01342	0.05310	0.2101	0.8316
26	0.000055	0.000216	0.000857	0.003390	0.01342	0.05310	0.2101

Estimated R Matrix for id 1

Row	Col22	Col23	Col24	Col25	Col26
1	0.03638	0.1440	0.5698	2.2550	8.9243
2	0.002323	0.000587	0.000148	0.000037	9.47E-6
3	0.009193	0.002323	0.000587	0.000148	0.000037
4	0.03638	0.009193	0.002323	0.000587	0.000148
5	0.1440	0.03638	0.009193	0.002323	0.000587
6	0.5698	0.1440	0.03638	0.009193	0.002323
7	2.2550	0.5698	0.1440	0.03638	0.009193
8	8.9243	2.2550	0.5698	0.1440	0.03638
9	35.3179	8.9243	2.2550	0.5698	0.1440
10	8.9243	35.3179	8.9243	2.2550	0.5698
11	2.2550	8.9243	35.3179	8.9243	2.2550
12	0.5698	2.2550	8.9243	35.3179	8.9243
13	0.1440	0.5698	2.2550	8.9243	35.3179
14	0.2101	0.8316	3.2911	13.0247	51.5456
15	0.01342	0.003390	0.000857	0.000216	0.000055
16	0.05310	0.01342	0.003390	0.000857	0.000216
17	0.2101	0.05310	0.01342	0.003390	0.000857
18	0.8316	0.2101	0.05310	0.01342	0.003390
19	3.2911	0.8316	0.2101	0.05310	0.01342
20	13.0247	3.2911	0.8316	0.2101	0.05310
21	51.5456	13.0247	3.2911	0.8316	0.2101

22	203.99	51.5456	13.0247	3.2911	0.8316
23	51.5456	203.99	51.5456	13.0247	3.2911
24	13.0247	51.5456	203.99	51.5456	13.0247
25	3.2911	13.0247	51.5456	203.99	51.5456
26	0.8316	3.2911	13.0247	51.5456	203.99

Estimated R Correlation Matrix for id 1

Row	Col1	Col2	Col3	Col4	Col5	Col6	Col7
1	1.0000	6.775E-8	2.681E-7	1.061E-6	4.199E-6	0.000017	0.000066
2	6.775E-8	1.0000	0.2527	0.06385	0.01613	0.004077	0.001030
3	2.681E-7	0.2527	1.0000	0.2527	0.06385	0.01613	0.004077
4	1.061E-6	0.06385	0.2527	1.0000	0.2527	0.06385	0.01613
5	4.199E-6	0.01613	0.06385	0.2527	1.0000	0.2527	0.06385
6	0.000017	0.004077	0.01613	0.06385	0.2527	1.0000	0.2527
7	0.000066	0.001030	0.004077	0.01613	0.06385	0.2527	1.0000
8	0.000260	0.000260	0.001030	0.004077	0.01613	0.06385	0.2527
9	0.001030	0.000066	0.000260	0.001030	0.004077	0.01613	0.06385
10	0.004077	0.000017	0.000066	0.000260	0.001030	0.004077	0.01613
11	0.01613	4.199E-6	0.000017	0.000066	0.000260	0.001030	0.004077
12	0.06385	1.061E-6	4.199E-6	0.000017	0.000066	0.000260	0.001030
13	0.2527	2.681E-7	1.061E-6	4.199E-6	0.000017	0.000066	0.000260
14	0.1701	1.152E-8	4.56E-8	1.805E-7	7.142E-7	2.826E-6	0.000011
15	1.152E-8	0.1701	0.04297	0.01086	0.002744	0.000693	0.000175
16	4.56E-8	0.04297	0.1701	0.04297	0.01086	0.002744	0.000693
17	1.805E-7	0.01086	0.04297	0.1701	0.04297	0.01086	0.002744
18	7.142E-7	0.002744	0.01086	0.04297	0.1701	0.04297	0.01086
19	2.826E-6	0.000693	0.002744	0.01086	0.04297	0.1701	0.04297
20	0.000011	0.000175	0.000693	0.002744	0.01086	0.04297	0.1701
21	0.000044	0.000044	0.000175	0.000693	0.002744	0.01086	0.04297
22	0.000175	0.000011	0.000044	0.000175	0.000693	0.002744	0.01086
23	0.000693	2.826E-6	0.000011	0.000044	0.000175	0.000693	0.002744
24	0.002744	7.142E-7	2.826E-6	0.000011	0.000044	0.000175	0.000693
25	0.01086	1.805E-7	7.142E-7	2.826E-6	0.000011	0.000044	0.000175
26	0.04297	4.56E-8	1.805E-7	7.142E-7	2.826E-6	0.000011	0.000044

Estimated R Correlation Matrix for id 1

Row	Col8	Col9	Col10	Col11	Col12	Col13	Col14
1	0.000260	0.001030	0.004077	0.01613	0.06385	0.2527	0.1701
2	0.000260	0.000066	0.000017	4.199E-6	1.061E-6	2.681E-7	1.152E-8
3	0.001030	0.000260	0.000066	0.000017	4.199E-6	1.061E-6	4.56E-8
4	0.004077	0.001030	0.000260	0.000066	0.000017	4.199E-6	1.805E-7
5	0.01613	0.004077	0.001030	0.000260	0.000066	0.000017	7.142E-7
6	0.06385	0.01613	0.004077	0.001030	0.000260	0.000066	2.826E-6
7	0.2527	0.06385	0.01613	0.004077	0.001030	0.000260	0.000011
8	1.0000	0.2527	0.06385	0.01613	0.004077	0.001030	0.000044
9	0.2527	1.0000	0.2527	0.06385	0.01613	0.004077	0.000175
10	0.06385	0.2527	1.0000	0.2527	0.06385	0.01613	0.000693
11	0.01613	0.06385	0.2527	1.0000	0.2527	0.06385	0.002744
12	0.004077	0.01613	0.06385	0.2527	1.0000	0.2527	0.01086
13	0.001030	0.004077	0.01613	0.06385	0.2527	1.0000	0.04297

14	0.000044	0.000175	0.000693	0.002744	0.01086	0.04297	1.0000
15	0.000044	0.000011	2.826E-6	7.142E-7	1.805E-7	4.56E-8	6.775E-8
16	0.000175	0.000044	0.000011	2.826E-6	7.142E-7	1.805E-7	2.681E-7
17	0.000693	0.000175	0.000044	0.000011	2.826E-6	7.142E-7	1.061E-6
18	0.002744	0.000693	0.000175	0.000044	0.000011	2.826E-6	4.199E-6
19	0.01086	0.002744	0.000693	0.000175	0.000044	0.000011	0.000017
20	0.04297	0.01086	0.002744	0.000693	0.000175	0.000044	0.000066
21	0.1701	0.04297	0.01086	0.002744	0.000693	0.000175	0.000260
22	0.04297	0.1701	0.04297	0.01086	0.002744	0.000693	0.001030
23	0.01086	0.04297	0.1701	0.04297	0.01086	0.002744	0.004077
24	0.002744	0.01086	0.04297	0.1701	0.04297	0.01086	0.01613
25	0.000693	0.002744	0.01086	0.04297	0.1701	0.04297	0.06385
26	0.000175	0.000693	0.002744	0.01086	0.04297	0.1701	0.2527

Estimated R Correlation Matrix for id 1

Row	Col15	Col16	Col17	Col18	Col19	Col20	Col21
1	1.152E-8	4.56E-8	1.805E-7	7.142E-7	2.826E-6	0.000011	0.000044
2	0.1701	0.04297	0.01086	0.002744	0.000693	0.000175	0.000044
3	0.04297	0.1701	0.04297	0.01086	0.002744	0.000693	0.000175
4	0.01086	0.04297	0.1701	0.04297	0.01086	0.002744	0.000693
5	0.002744	0.01086	0.04297	0.1701	0.04297	0.01086	0.002744
6	0.000693	0.002744	0.01086	0.04297	0.1701	0.04297	0.01086
7	0.000175	0.000693	0.002744	0.01086	0.04297	0.1701	0.04297
8	0.000044	0.000175	0.000693	0.002744	0.01086	0.04297	0.1701
9	0.000011	0.000044	0.000175	0.000693	0.002744	0.01086	0.04297
10	2.826E-6	0.000011	0.000044	0.000175	0.000693	0.002744	0.01086
11	7.142E-7	2.826E-6	0.000011	0.000044	0.000175	0.000693	0.002744
12	1.805E-7	7.142E-7	2.826E-6	0.000011	0.000044	0.000175	0.000693
13	4.56E-8	1.805E-7	7.142E-7	2.826E-6	0.000011	0.000044	0.000175
14	6.775E-8	2.681E-7	1.061E-6	4.199E-6	0.000017	0.000066	0.000260
15	1.0000	0.2527	0.06385	0.01613	0.004077	0.001030	0.000260
16	0.2527	1.0000	0.2527	0.06385	0.01613	0.004077	0.001030
17	0.06385	0.2527	1.0000	0.2527	0.06385	0.01613	0.004077
18	0.01613	0.06385	0.2527	1.0000	0.2527	0.06385	0.01613
19	0.004077	0.01613	0.06385	0.2527	1.0000	0.2527	0.06385
20	0.001030	0.004077	0.01613	0.06385	0.2527	1.0000	0.2527
21	0.000260	0.001030	0.004077	0.01613	0.06385	0.2527	1.0000
22	0.000066	0.000260	0.001030	0.004077	0.01613	0.06385	0.2527
23	0.000017	0.000066	0.000260	0.001030	0.004077	0.01613	0.06385
24	4.199E-6	0.000017	0.000066	0.000260	0.001030	0.004077	0.01613
25	1.061E-6	4.199E-6	0.000017	0.000066	0.000260	0.001030	0.004077
26	2.681E-7	1.061E-6	4.199E-6	0.000017	0.000066	0.000260	0.001030

Estimated R Correlation Matrix for id 1

Row	Col22	Col23	Col24	Col25	Col26
1	0.000175	0.000693	0.002744	0.01086	0.04297
2	0.000011	2.826E-6	7.142E-7	1.805E-7	4.56E-8
3	0.000044	0.000011	2.826E-6	7.142E-7	1.805E-7
4	0.000175	0.000044	0.000011	2.826E-6	7.142E-7
5	0.000693	0.000175	0.000044	0.000011	2.826E-6

6	0.002744	0.000693	0.000175	0.000044	0.000011
7	0.01086	0.002744	0.000693	0.000175	0.000044
8	0.04297	0.01086	0.002744	0.000693	0.000175
9	0.1701	0.04297	0.01086	0.002744	0.000693
10	0.04297	0.1701	0.04297	0.01086	0.002744
11	0.01086	0.04297	0.1701	0.04297	0.01086
12	0.002744	0.01086	0.04297	0.1701	0.04297
13	0.000693	0.002744	0.01086	0.04297	0.1701
14	0.001030	0.004077	0.01613	0.06385	0.2527
15	0.000066	0.000017	4.199E-6	1.061E-6	2.681E-7
16	0.000260	0.000066	0.000017	4.199E-6	1.061E-6
17	0.001030	0.000260	0.000066	0.000017	4.199E-6
18	0.004077	0.001030	0.000260	0.000066	0.000017
19	0.01613	0.004077	0.001030	0.000260	0.000066
20	0.06385	0.01613	0.004077	0.001030	0.000260
21	0.2527	0.06385	0.01613	0.004077	0.001030
22	1.0000	0.2527	0.06385	0.01613	0.004077
23	0.2527	1.0000	0.2527	0.06385	0.01613
24	0.06385	0.2527	1.0000	0.2527	0.06385
25	0.01613	0.06385	0.2527	1.0000	0.2527
26	0.004077	0.01613	0.06385	0.2527	1.0000

Covariance Parameter Estimates

Cov Parm	Subject	Estimate
day UN(1,1)	id	203.99
UN(2,1)	id	35.3179
UN(2,2)	id	211.42
time AR(1)	id	0.2527

Fit Statistics

-2 Log Likelihood	6316.7
AIC (Smaller is Better)	6376.7
AICC (Smaller is Better)	6379.1
BIC (Smaller is Better)	6418.7

Null Model Likelihood Ratio Test

DF	Chi-Square	Pr > ChiSq
3	73.79	<.0001

Solution for Fixed Effects

Effect	day	time	Standard				
			Estimate	Error	DF	t Value	
day		6	42.2900	2.6076	28	16.22	
day		1	38.0867	2.6547	28	14.35	
day*time		6	2	1.5567	3.6878	696	0.42
day*time		6	3	5.1367	3.6878	696	1.39
day*time		6	4	3.4267	3.6878	696	0.93

day*time	6	5	2.0700	3.6877	696	0.56
day*time	6	6	0.9300	3.6877	696	0.25
day*time	6	7	1.6633	3.6876	696	0.45
day*time	6	8	2.9500	3.6873	696	0.80
day*time	6	9	-3.6933	3.6859	696	-1.00
day*time	6	10	-4.8867	3.6802	696	-1.33
day*time	6	11	-10.2833	3.6579	696	-2.81
day*time	6	12	-14.6267	3.5681	696	-4.10
day*time	6	13	-19.0867	3.1880	696	-5.99
day*time	6	1	0	.	.	.
day*time	1	2	-0.8400	3.7543	696	-0.22
day*time	1	3	0.2067	3.7543	696	0.06
day*time	1	4	1.0167	3.7543	696	0.27
day*time	1	5	3.5233	3.7543	696	0.94
day*time	1	6	8.0800	3.7543	696	2.15
day*time	1	7	8.8467	3.7542	696	2.36
day*time	1	8	6.2367	3.7538	696	1.66
day*time	1	9	8.7600	3.7524	696	2.33
day*time	1	10	16.7133	3.7466	696	4.46
day*time	1	11	15.6033	3.7239	696	4.19
day*time	1	12	16.2300	3.6325	696	4.47
day*time	1	13	25.2067	3.2455	696	7.77
day*time	1	1	0	.	.	.

Solution for Fixed Effects

Effect	day	time	Pr > t
day	6		<.0001
day	1		<.0001
day*time	6	2	0.6731
day*time	6	3	0.1641
day*time	6	4	0.3531
day*time	6	5	0.5748
day*time	6	6	0.8010
day*time	6	7	0.6521
day*time	6	8	0.4240
day*time	6	9	0.3167
day*time	6	10	0.1847
day*time	6	11	0.0051
day*time	6	12	<.0001
day*time	6	13	<.0001
day*time	6	1	.
day*time	1	2	0.8230
day*time	1	3	0.9561
day*time	1	4	0.7866
day*time	1	5	0.3483
day*time	1	6	0.0317
day*time	1	7	0.0187
day*time	1	8	0.0971
day*time	1	9	0.0199
day*time	1	10	<.0001
day*time	1	11	<.0001
day*time	1	12	<.0001

day*time	1	13	<.0001
day*time	1	1	.

Type 3 Tests of Fixed Effects

Effect	Num DF	Den DF	F Value	Pr > F
day	2	28	1863.27	<.0001
day*time	24	696	8.95	<.0001

Model with kronecker product - UN@CS

The Mixed Procedure

Model Information

Data Set	WORK.DAT
Dependent Variable	p1np
Covariance Structure	Unstructured @ Compound Symmetry
Subject Effect	id
Estimation Method	ML
Residual Variance Method	None
Fixed Effects SE Method	Model-Based
Degrees of Freedom Method	Between-Within

Class Level Information

Class	Levels	Values
id	30	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
day	2	6 1
time	13	2 3 4 5 6 7 8 9 10 11 12 13 1

Dimensions

Covariance Parameters	4
Columns in X	28
Columns in Z	0
Subjects	30
Max Obs per Subject	26

Number of Observations

Number of Observations Read	780
Number of Observations Used	780
Number of Observations Not Used	0

Iteration History

Iteration	Evaluations	-2 Log Like	Criterion
0	1	6390.44089023	
1	2	6296.05821323	0.00027404
2	1	6295.34207730	0.00000482
3	1	6295.33015604	0.00000000

Convergence criteria met.

Estimated R Matrix for id 1

Row	Col1	Col2	Col3	Col4	Col5	Col6	Col7
1	216.38	38.9304	38.9304	38.9304	38.9304	38.9304	38.9304
2	38.9304	216.38	38.9304	38.9304	38.9304	38.9304	38.9304
3	38.9304	38.9304	216.38	38.9304	38.9304	38.9304	38.9304
4	38.9304	38.9304	38.9304	216.38	38.9304	38.9304	38.9304
5	38.9304	38.9304	38.9304	38.9304	216.38	38.9304	38.9304
6	38.9304	38.9304	38.9304	38.9304	38.9304	216.38	38.9304
7	38.9304	38.9304	38.9304	38.9304	38.9304	38.9304	216.38
8	38.9304	38.9304	38.9304	38.9304	38.9304	38.9304	38.9304
9	38.9304	38.9304	38.9304	38.9304	38.9304	38.9304	38.9304
10	38.9304	38.9304	38.9304	38.9304	38.9304	38.9304	38.9304
11	38.9304	38.9304	38.9304	38.9304	38.9304	38.9304	38.9304
12	38.9304	38.9304	38.9304	38.9304	38.9304	38.9304	38.9304
13	38.9304	38.9304	38.9304	38.9304	38.9304	38.9304	38.9304
14	27.6828	4.9805	4.9805	4.9805	4.9805	4.9805	4.9805
15	4.9805	27.6828	4.9805	4.9805	4.9805	4.9805	4.9805
16	4.9805	4.9805	27.6828	4.9805	4.9805	4.9805	4.9805
17	4.9805	4.9805	4.9805	27.6828	4.9805	4.9805	4.9805
18	4.9805	4.9805	4.9805	4.9805	27.6828	4.9805	4.9805
19	4.9805	4.9805	4.9805	4.9805	4.9805	27.6828	4.9805
20	4.9805	4.9805	4.9805	4.9805	4.9805	4.9805	27.6828
21	4.9805	4.9805	4.9805	4.9805	4.9805	4.9805	4.9805
22	4.9805	4.9805	4.9805	4.9805	4.9805	4.9805	4.9805
23	4.9805	4.9805	4.9805	4.9805	4.9805	4.9805	4.9805
24	4.9805	4.9805	4.9805	4.9805	4.9805	4.9805	4.9805
25	4.9805	4.9805	4.9805	4.9805	4.9805	4.9805	4.9805
26	4.9805	4.9805	4.9805	4.9805	4.9805	4.9805	4.9805

Estimated R Matrix for id 1

Row	Col8	Col9	Col10	Col11	Col12	Col13	Col14
1	38.9304	38.9304	38.9304	38.9304	38.9304	38.9304	27.6828
2	38.9304	38.9304	38.9304	38.9304	38.9304	38.9304	4.9805
3	38.9304	38.9304	38.9304	38.9304	38.9304	38.9304	4.9805
4	38.9304	38.9304	38.9304	38.9304	38.9304	38.9304	4.9805
5	38.9304	38.9304	38.9304	38.9304	38.9304	38.9304	4.9805
6	38.9304	38.9304	38.9304	38.9304	38.9304	38.9304	4.9805
7	38.9304	38.9304	38.9304	38.9304	38.9304	38.9304	4.9805
8	216.38	38.9304	38.9304	38.9304	38.9304	38.9304	4.9805
9	38.9304	216.38	38.9304	38.9304	38.9304	38.9304	4.9805

10	38.9304	38.9304	216.38	38.9304	38.9304	38.9304	4.9805
11	38.9304	38.9304	38.9304	216.38	38.9304	38.9304	4.9805
12	38.9304	38.9304	38.9304	38.9304	216.38	38.9304	4.9805
13	38.9304	38.9304	38.9304	38.9304	38.9304	216.38	4.9805
14	4.9805	4.9805	4.9805	4.9805	4.9805	4.9805	199.55
15	4.9805	4.9805	4.9805	4.9805	4.9805	4.9805	35.9012
16	4.9805	4.9805	4.9805	4.9805	4.9805	4.9805	35.9012
17	4.9805	4.9805	4.9805	4.9805	4.9805	4.9805	35.9012
18	4.9805	4.9805	4.9805	4.9805	4.9805	4.9805	35.9012
19	4.9805	4.9805	4.9805	4.9805	4.9805	4.9805	35.9012
20	4.9805	4.9805	4.9805	4.9805	4.9805	4.9805	35.9012
21	27.6828	4.9805	4.9805	4.9805	4.9805	4.9805	35.9012
22	4.9805	27.6828	4.9805	4.9805	4.9805	4.9805	35.9012
23	4.9805	4.9805	27.6828	4.9805	4.9805	4.9805	35.9012
24	4.9805	4.9805	4.9805	27.6828	4.9805	4.9805	35.9012
25	4.9805	4.9805	4.9805	4.9805	27.6828	4.9805	35.9012
26	4.9805	4.9805	4.9805	4.9805	4.9805	27.6828	35.9012

Estimated R Matrix for id 1

Row	Col15	Col16	Col17	Col18	Col19	Col20	Col21
1	4.9805	4.9805	4.9805	4.9805	4.9805	4.9805	4.9805
2	27.6828	4.9805	4.9805	4.9805	4.9805	4.9805	4.9805
3	4.9805	27.6828	4.9805	4.9805	4.9805	4.9805	4.9805
4	4.9805	4.9805	27.6828	4.9805	4.9805	4.9805	4.9805
5	4.9805	4.9805	4.9805	27.6828	4.9805	4.9805	4.9805
6	4.9805	4.9805	4.9805	4.9805	27.6828	4.9805	4.9805
7	4.9805	4.9805	4.9805	4.9805	4.9805	27.6828	4.9805
8	4.9805	4.9805	4.9805	4.9805	4.9805	4.9805	27.6828
9	4.9805	4.9805	4.9805	4.9805	4.9805	4.9805	4.9805
10	4.9805	4.9805	4.9805	4.9805	4.9805	4.9805	4.9805
11	4.9805	4.9805	4.9805	4.9805	4.9805	4.9805	4.9805
12	4.9805	4.9805	4.9805	4.9805	4.9805	4.9805	4.9805
13	4.9805	4.9805	4.9805	4.9805	4.9805	4.9805	4.9805
14	35.9012	35.9012	35.9012	35.9012	35.9012	35.9012	35.9012
15	199.55	35.9012	35.9012	35.9012	35.9012	35.9012	35.9012
16	35.9012	199.55	35.9012	35.9012	35.9012	35.9012	35.9012
17	35.9012	35.9012	199.55	35.9012	35.9012	35.9012	35.9012
18	35.9012	35.9012	35.9012	199.55	35.9012	35.9012	35.9012
19	35.9012	35.9012	35.9012	35.9012	199.55	35.9012	35.9012
20	35.9012	35.9012	35.9012	35.9012	35.9012	199.55	35.9012
21	35.9012	35.9012	35.9012	35.9012	35.9012	35.9012	199.55
22	35.9012	35.9012	35.9012	35.9012	35.9012	35.9012	35.9012
23	35.9012	35.9012	35.9012	35.9012	35.9012	35.9012	35.9012
24	35.9012	35.9012	35.9012	35.9012	35.9012	35.9012	35.9012
25	35.9012	35.9012	35.9012	35.9012	35.9012	35.9012	35.9012
26	35.9012	35.9012	35.9012	35.9012	35.9012	35.9012	35.9012

Estimated R Matrix for id 1

Row	Col22	Col23	Col24	Col25	Col26
1	4.9805	4.9805	4.9805	4.9805	4.9805

2	4.9805	4.9805	4.9805	4.9805	4.9805
3	4.9805	4.9805	4.9805	4.9805	4.9805
4	4.9805	4.9805	4.9805	4.9805	4.9805
5	4.9805	4.9805	4.9805	4.9805	4.9805
6	4.9805	4.9805	4.9805	4.9805	4.9805
7	4.9805	4.9805	4.9805	4.9805	4.9805
8	4.9805	4.9805	4.9805	4.9805	4.9805
9	27.6828	4.9805	4.9805	4.9805	4.9805
10	4.9805	27.6828	4.9805	4.9805	4.9805
11	4.9805	4.9805	27.6828	4.9805	4.9805
12	4.9805	4.9805	4.9805	27.6828	4.9805
13	4.9805	4.9805	4.9805	4.9805	27.6828
14	35.9012	35.9012	35.9012	35.9012	35.9012
15	35.9012	35.9012	35.9012	35.9012	35.9012
16	35.9012	35.9012	35.9012	35.9012	35.9012
17	35.9012	35.9012	35.9012	35.9012	35.9012
18	35.9012	35.9012	35.9012	35.9012	35.9012
19	35.9012	35.9012	35.9012	35.9012	35.9012
20	35.9012	35.9012	35.9012	35.9012	35.9012
21	35.9012	35.9012	35.9012	35.9012	35.9012
22	199.55	35.9012	35.9012	35.9012	35.9012
23	35.9012	199.55	35.9012	35.9012	35.9012
24	35.9012	35.9012	199.55	35.9012	35.9012
25	35.9012	35.9012	35.9012	199.55	35.9012
26	35.9012	35.9012	35.9012	35.9012	199.55

Estimated R Correlation Matrix for id 1

Row	Col1	Col2	Col3	Col4	Col5	Col6	Col7
1	1.0000	0.1799	0.1799	0.1799	0.1799	0.1799	0.1799
2	0.1799	1.0000	0.1799	0.1799	0.1799	0.1799	0.1799
3	0.1799	0.1799	1.0000	0.1799	0.1799	0.1799	0.1799
4	0.1799	0.1799	0.1799	1.0000	0.1799	0.1799	0.1799
5	0.1799	0.1799	0.1799	0.1799	1.0000	0.1799	0.1799
6	0.1799	0.1799	0.1799	0.1799	0.1799	1.0000	0.1799
7	0.1799	0.1799	0.1799	0.1799	0.1799	0.1799	1.0000
8	0.1799	0.1799	0.1799	0.1799	0.1799	0.1799	0.1799
9	0.1799	0.1799	0.1799	0.1799	0.1799	0.1799	0.1799
10	0.1799	0.1799	0.1799	0.1799	0.1799	0.1799	0.1799
11	0.1799	0.1799	0.1799	0.1799	0.1799	0.1799	0.1799
12	0.1799	0.1799	0.1799	0.1799	0.1799	0.1799	0.1799
13	0.1799	0.1799	0.1799	0.1799	0.1799	0.1799	0.1799
14	0.1332	0.02397	0.02397	0.02397	0.02397	0.02397	0.02397
15	0.02397	0.1332	0.02397	0.02397	0.02397	0.02397	0.02397
16	0.02397	0.02397	0.1332	0.02397	0.02397	0.02397	0.02397
17	0.02397	0.02397	0.02397	0.1332	0.02397	0.02397	0.02397
18	0.02397	0.02397	0.02397	0.02397	0.1332	0.02397	0.02397
19	0.02397	0.02397	0.02397	0.02397	0.02397	0.1332	0.02397
20	0.02397	0.02397	0.02397	0.02397	0.02397	0.02397	0.1332
21	0.02397	0.02397	0.02397	0.02397	0.02397	0.02397	0.02397
22	0.02397	0.02397	0.02397	0.02397	0.02397	0.02397	0.02397
23	0.02397	0.02397	0.02397	0.02397	0.02397	0.02397	0.02397
24	0.02397	0.02397	0.02397	0.02397	0.02397	0.02397	0.02397

25	0.02397	0.02397	0.02397	0.02397	0.02397	0.02397	0.02397
26	0.02397	0.02397	0.02397	0.02397	0.02397	0.02397	0.02397

Estimated R Correlation Matrix for id 1

Row	Col8	Col9	Col10	Col11	Col12	Col13	Col14
1	0.1799	0.1799	0.1799	0.1799	0.1799	0.1799	0.1332
2	0.1799	0.1799	0.1799	0.1799	0.1799	0.1799	0.02397
3	0.1799	0.1799	0.1799	0.1799	0.1799	0.1799	0.02397
4	0.1799	0.1799	0.1799	0.1799	0.1799	0.1799	0.02397
5	0.1799	0.1799	0.1799	0.1799	0.1799	0.1799	0.02397
6	0.1799	0.1799	0.1799	0.1799	0.1799	0.1799	0.02397
7	0.1799	0.1799	0.1799	0.1799	0.1799	0.1799	0.02397
8	1.0000	0.1799	0.1799	0.1799	0.1799	0.1799	0.02397
9	0.1799	1.0000	0.1799	0.1799	0.1799	0.1799	0.02397
10	0.1799	0.1799	1.0000	0.1799	0.1799	0.1799	0.02397
11	0.1799	0.1799	0.1799	1.0000	0.1799	0.1799	0.02397
12	0.1799	0.1799	0.1799	0.1799	1.0000	0.1799	0.02397
13	0.1799	0.1799	0.1799	0.1799	0.1799	1.0000	0.02397
14	0.02397	0.02397	0.02397	0.02397	0.02397	0.02397	1.0000
15	0.02397	0.02397	0.02397	0.02397	0.02397	0.02397	0.1799
16	0.02397	0.02397	0.02397	0.02397	0.02397	0.02397	0.1799
17	0.02397	0.02397	0.02397	0.02397	0.02397	0.02397	0.1799
18	0.02397	0.02397	0.02397	0.02397	0.02397	0.02397	0.1799
19	0.02397	0.02397	0.02397	0.02397	0.02397	0.02397	0.1799
20	0.02397	0.02397	0.02397	0.02397	0.02397	0.02397	0.1799
21	0.1332	0.02397	0.02397	0.02397	0.02397	0.02397	0.1799
22	0.02397	0.1332	0.02397	0.02397	0.02397	0.02397	0.1799
23	0.02397	0.02397	0.1332	0.02397	0.02397	0.02397	0.1799
24	0.02397	0.02397	0.02397	0.1332	0.02397	0.02397	0.1799
25	0.02397	0.02397	0.02397	0.02397	0.1332	0.02397	0.1799
26	0.02397	0.02397	0.02397	0.02397	0.02397	0.1332	0.1799

Estimated R Correlation Matrix for id 1

Row	Col15	Col16	Col17	Col18	Col19	Col20	Col21
1	0.02397	0.02397	0.02397	0.02397	0.02397	0.02397	0.02397
2	0.1332	0.02397	0.02397	0.02397	0.02397	0.02397	0.02397
3	0.02397	0.1332	0.02397	0.02397	0.02397	0.02397	0.02397
4	0.02397	0.02397	0.1332	0.02397	0.02397	0.02397	0.02397
5	0.02397	0.02397	0.02397	0.1332	0.02397	0.02397	0.02397
6	0.02397	0.02397	0.02397	0.02397	0.1332	0.02397	0.02397
7	0.02397	0.02397	0.02397	0.02397	0.02397	0.1332	0.02397
8	0.02397	0.02397	0.02397	0.02397	0.02397	0.02397	0.1332
9	0.02397	0.02397	0.02397	0.02397	0.02397	0.02397	0.02397
10	0.02397	0.02397	0.02397	0.02397	0.02397	0.02397	0.02397
11	0.02397	0.02397	0.02397	0.02397	0.02397	0.02397	0.02397
12	0.02397	0.02397	0.02397	0.02397	0.02397	0.02397	0.02397
13	0.02397	0.02397	0.02397	0.02397	0.02397	0.02397	0.02397
14	0.1799	0.1799	0.1799	0.1799	0.1799	0.1799	0.1799
15	1.0000	0.1799	0.1799	0.1799	0.1799	0.1799	0.1799
16	0.1799	1.0000	0.1799	0.1799	0.1799	0.1799	0.1799

17	0.1799	0.1799	1.0000	0.1799	0.1799	0.1799	0.1799
18	0.1799	0.1799	0.1799	1.0000	0.1799	0.1799	0.1799
19	0.1799	0.1799	0.1799	0.1799	1.0000	0.1799	0.1799
20	0.1799	0.1799	0.1799	0.1799	0.1799	1.0000	0.1799
21	0.1799	0.1799	0.1799	0.1799	0.1799	0.1799	1.0000
22	0.1799	0.1799	0.1799	0.1799	0.1799	0.1799	0.1799
23	0.1799	0.1799	0.1799	0.1799	0.1799	0.1799	0.1799
24	0.1799	0.1799	0.1799	0.1799	0.1799	0.1799	0.1799
25	0.1799	0.1799	0.1799	0.1799	0.1799	0.1799	0.1799
26	0.1799	0.1799	0.1799	0.1799	0.1799	0.1799	0.1799

Estimated R Correlation Matrix for id 1

Row	Col22	Col23	Col24	Col25	Col26
1	0.02397	0.02397	0.02397	0.02397	0.02397
2	0.02397	0.02397	0.02397	0.02397	0.02397
3	0.02397	0.02397	0.02397	0.02397	0.02397
4	0.02397	0.02397	0.02397	0.02397	0.02397
5	0.02397	0.02397	0.02397	0.02397	0.02397
6	0.02397	0.02397	0.02397	0.02397	0.02397
7	0.02397	0.02397	0.02397	0.02397	0.02397
8	0.02397	0.02397	0.02397	0.02397	0.02397
9	0.1332	0.02397	0.02397	0.02397	0.02397
10	0.02397	0.1332	0.02397	0.02397	0.02397
11	0.02397	0.02397	0.1332	0.02397	0.02397
12	0.02397	0.02397	0.02397	0.1332	0.02397
13	0.02397	0.02397	0.02397	0.02397	0.1332
14	0.1799	0.1799	0.1799	0.1799	0.1799
15	0.1799	0.1799	0.1799	0.1799	0.1799
16	0.1799	0.1799	0.1799	0.1799	0.1799
17	0.1799	0.1799	0.1799	0.1799	0.1799
18	0.1799	0.1799	0.1799	0.1799	0.1799
19	0.1799	0.1799	0.1799	0.1799	0.1799
20	0.1799	0.1799	0.1799	0.1799	0.1799
21	0.1799	0.1799	0.1799	0.1799	0.1799
22	1.0000	0.1799	0.1799	0.1799	0.1799
23	0.1799	1.0000	0.1799	0.1799	0.1799
24	0.1799	0.1799	1.0000	0.1799	0.1799
25	0.1799	0.1799	0.1799	1.0000	0.1799
26	0.1799	0.1799	0.1799	0.1799	1.0000

Covariance Parameter Estimates

Cov Parm	Subject	Estimate
day UN(1,1)	id	199.55
UN(2,1)	id	27.6828
UN(2,2)	id	216.38
time Corr	id	0.1799

Fit Statistics

-2 Log Likelihood	6295.3
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AIC (Smaller is Better)	6355.3
AICC (Smaller is Better)	6357.8
BIC (Smaller is Better)	6397.4

Null Model Likelihood Ratio Test

DF	Chi-Square	Pr > ChiSq
3	95.11	<.0001

Solution for Fixed Effects

Effect	day	time	Estimate	Standard Error	DF	t Value
day	6		42.2900	2.5791	28	16.40
day	1		38.0867	2.6857	28	14.18
day*time	6	2	1.5567	3.3030	696	0.47
day*time	6	3	5.1367	3.3030	696	1.56
day*time	6	4	3.4267	3.3030	696	1.04
day*time	6	5	2.0700	3.3030	696	0.63
day*time	6	6	0.9300	3.3030	696	0.28
day*time	6	7	1.6633	3.3030	696	0.50
day*time	6	8	2.9500	3.3030	696	0.89
day*time	6	9	-3.6933	3.3030	696	-1.12
day*time	6	10	-4.8867	3.3030	696	-1.48
day*time	6	11	-10.2833	3.3030	696	-3.11
day*time	6	12	-14.6267	3.3030	696	-4.43
day*time	6	13	-19.0867	3.3030	696	-5.78
day*time	6	1	0	.	.	.
day*time	1	2	-0.8400	3.4395	696	-0.24
day*time	1	3	0.2067	3.4395	696	0.06
day*time	1	4	1.0167	3.4395	696	0.30
day*time	1	5	3.5233	3.4395	696	1.02
day*time	1	6	8.0800	3.4395	696	2.35
day*time	1	7	8.8467	3.4395	696	2.57
day*time	1	8	6.2367	3.4395	696	1.81
day*time	1	9	8.7600	3.4395	696	2.55
day*time	1	10	16.7133	3.4395	696	4.86
day*time	1	11	15.6033	3.4395	696	4.54
day*time	1	12	16.2300	3.4395	696	4.72
day*time	1	13	25.2067	3.4395	696	7.33
day*time	1	1	0	.	.	.

Solution for Fixed Effects

Effect	day	time	Pr > t
day	6		<.0001
day	1		<.0001
day*time	6	2	0.6376
day*time	6	3	0.1204
day*time	6	4	0.2999
day*time	6	5	0.5311

day*time	6	6	0.7784
day*time	6	7	0.6147
day*time	6	8	0.3721
day*time	6	9	0.2639
day*time	6	10	0.1395
day*time	6	11	0.0019
day*time	6	12	<.0001
day*time	6	13	<.0001
day*time	6	1	.
day*time	1	2	0.8071
day*time	1	3	0.9521
day*time	1	4	0.7676
day*time	1	5	0.3060
day*time	1	6	0.0191
day*time	1	7	0.0103
day*time	1	8	0.0702
day*time	1	9	0.0111
day*time	1	10	<.0001
day*time	1	11	<.0001
day*time	1	12	<.0001
day*time	1	13	<.0001
day*time	1	1	.

Type 3 Tests of Fixed Effects

Effect	Num DF	Den DF	F Value	Pr > F
day	2	28	974.06	<.0001
day*time	24	696	12.15	<.0001

Model 2 with random intercepts

The Mixed Procedure

Model Information

Data Set	WORK.DAT
Dependent Variable	p1np
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	30	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						
day	2	6	1											
time	13	2	3	4	5	6	7	8	9	10	11	12	13	1

Dimensions

Covariance Parameters	2
Columns in X	28
Columns in Z per Subject	1
Subjects	30
Max Obs per Subject	26

Number of Observations

Number of Observations Read	780
Number of Observations Used	780
Number of Observations Not Used	0

Iteration History

Iteration	Evaluations	-2 Log Like	Criterion
0	1	6390.44089023	
1	1	6275.53743129	0.00000000

Convergence criteria met.

Estimated G Matrix

Row	Effect	id	Col1
1	Intercept	1	42.6704

Estimated G Correlation Matrix

Row	Effect	id	Col1
1	Intercept	1	1.0000

Estimated V Matrix for id 1

Row	Col1	Col2	Col3	Col4	Col5	Col6	Col7
1	211.66	42.6704	42.6704	42.6704	42.6704	42.6704	42.6704
2	42.6704	211.66	42.6704	42.6704	42.6704	42.6704	42.6704
3	42.6704	42.6704	211.66	42.6704	42.6704	42.6704	42.6704
4	42.6704	42.6704	42.6704	211.66	42.6704	42.6704	42.6704
5	42.6704	42.6704	42.6704	42.6704	211.66	42.6704	42.6704
6	42.6704	42.6704	42.6704	42.6704	42.6704	211.66	42.6704
7	42.6704	42.6704	42.6704	42.6704	42.6704	42.6704	211.66
8	42.6704	42.6704	42.6704	42.6704	42.6704	42.6704	42.6704
9	42.6704	42.6704	42.6704	42.6704	42.6704	42.6704	42.6704
10	42.6704	42.6704	42.6704	42.6704	42.6704	42.6704	42.6704
11	42.6704	42.6704	42.6704	42.6704	42.6704	42.6704	42.6704

[illegible]

Estimated V Matrix for id 1

[illegible]

Estimated V Matrix for id 1

[illegible]

4	42.6704	42.6704	42.6704	42.6704	42.6704	42.6704	42.6704
5	42.6704	42.6704	42.6704	42.6704	42.6704	42.6704	42.6704
6	42.6704	42.6704	42.6704	42.6704	42.6704	42.6704	42.6704
7	42.6704	42.6704	42.6704	42.6704	42.6704	42.6704	42.6704
8	42.6704	42.6704	42.6704	42.6704	42.6704	42.6704	42.6704
9	42.6704	42.6704	42.6704	42.6704	42.6704	42.6704	42.6704
10	42.6704	42.6704	42.6704	42.6704	42.6704	42.6704	42.6704
11	42.6704	42.6704	42.6704	42.6704	42.6704	42.6704	42.6704
12	42.6704	42.6704	42.6704	42.6704	42.6704	42.6704	42.6704
13	42.6704	42.6704	42.6704	42.6704	42.6704	42.6704	42.6704
14	42.6704	42.6704	42.6704	42.6704	42.6704	42.6704	42.6704
15	211.66	42.6704	42.6704	42.6704	42.6704	42.6704	42.6704
16	42.6704	211.66	42.6704	42.6704	42.6704	42.6704	42.6704
17	42.6704	42.6704	211.66	42.6704	42.6704	42.6704	42.6704
18	42.6704	42.6704	42.6704	211.66	42.6704	42.6704	42.6704
19	42.6704	42.6704	42.6704	42.6704	211.66	42.6704	42.6704
20	42.6704	42.6704	42.6704	42.6704	42.6704	211.66	42.6704
21	42.6704	42.6704	42.6704	42.6704	42.6704	42.6704	211.66
22	42.6704	42.6704	42.6704	42.6704	42.6704	42.6704	42.6704
23	42.6704	42.6704	42.6704	42.6704	42.6704	42.6704	42.6704
24	42.6704	42.6704	42.6704	42.6704	42.6704	42.6704	42.6704
25	42.6704	42.6704	42.6704	42.6704	42.6704	42.6704	42.6704
26	42.6704	42.6704	42.6704	42.6704	42.6704	42.6704	42.6704

Estimated V Matrix for id 1

Row	Col22	Col23	Col24	Col25	Col26
1	42.6704	42.6704	42.6704	42.6704	42.6704
2	42.6704	42.6704	42.6704	42.6704	42.6704
3	42.6704	42.6704	42.6704	42.6704	42.6704
4	42.6704	42.6704	42.6704	42.6704	42.6704
5	42.6704	42.6704	42.6704	42.6704	42.6704
6	42.6704	42.6704	42.6704	42.6704	42.6704
7	42.6704	42.6704	42.6704	42.6704	42.6704
8	42.6704	42.6704	42.6704	42.6704	42.6704
9	42.6704	42.6704	42.6704	42.6704	42.6704
10	42.6704	42.6704	42.6704	42.6704	42.6704
11	42.6704	42.6704	42.6704	42.6704	42.6704
12	42.6704	42.6704	42.6704	42.6704	42.6704
13	42.6704	42.6704	42.6704	42.6704	42.6704
14	42.6704	42.6704	42.6704	42.6704	42.6704
15	42.6704	42.6704	42.6704	42.6704	42.6704
16	42.6704	42.6704	42.6704	42.6704	42.6704
17	42.6704	42.6704	42.6704	42.6704	42.6704
18	42.6704	42.6704	42.6704	42.6704	42.6704
19	42.6704	42.6704	42.6704	42.6704	42.6704
20	42.6704	42.6704	42.6704	42.6704	42.6704
21	42.6704	42.6704	42.6704	42.6704	42.6704
22	211.66	42.6704	42.6704	42.6704	42.6704
23	42.6704	211.66	42.6704	42.6704	42.6704
24	42.6704	42.6704	211.66	42.6704	42.6704
25	42.6704	42.6704	42.6704	211.66	42.6704
26	42.6704	42.6704	42.6704	42.6704	211.66

Estimated V Correlation Matrix for id 1

Row	Col1	Col2	Col3	Col4	Col5	Col6	Col7
1	1.0000	0.2016	0.2016	0.2016	0.2016	0.2016	0.2016
2	0.2016	1.0000	0.2016	0.2016	0.2016	0.2016	0.2016
3	0.2016	0.2016	1.0000	0.2016	0.2016	0.2016	0.2016
4	0.2016	0.2016	0.2016	1.0000	0.2016	0.2016	0.2016
5	0.2016	0.2016	0.2016	0.2016	1.0000	0.2016	0.2016
6	0.2016	0.2016	0.2016	0.2016	0.2016	1.0000	0.2016
7	0.2016	0.2016	0.2016	0.2016	0.2016	0.2016	1.0000
8	0.2016	0.2016	0.2016	0.2016	0.2016	0.2016	0.2016
9	0.2016	0.2016	0.2016	0.2016	0.2016	0.2016	0.2016
10	0.2016	0.2016	0.2016	0.2016	0.2016	0.2016	0.2016
11	0.2016	0.2016	0.2016	0.2016	0.2016	0.2016	0.2016
12	0.2016	0.2016	0.2016	0.2016	0.2016	0.2016	0.2016
13	0.2016	0.2016	0.2016	0.2016	0.2016	0.2016	0.2016
14	0.2016	0.2016	0.2016	0.2016	0.2016	0.2016	0.2016
15	0.2016	0.2016	0.2016	0.2016	0.2016	0.2016	0.2016
16	0.2016	0.2016	0.2016	0.2016	0.2016	0.2016	0.2016
17	0.2016	0.2016	0.2016	0.2016	0.2016	0.2016	0.2016
18	0.2016	0.2016	0.2016	0.2016	0.2016	0.2016	0.2016
19	0.2016	0.2016	0.2016	0.2016	0.2016	0.2016	0.2016
20	0.2016	0.2016	0.2016	0.2016	0.2016	0.2016	0.2016
21	0.2016	0.2016	0.2016	0.2016	0.2016	0.2016	0.2016
22	0.2016	0.2016	0.2016	0.2016	0.2016	0.2016	0.2016
23	0.2016	0.2016	0.2016	0.2016	0.2016	0.2016	0.2016
24	0.2016	0.2016	0.2016	0.2016	0.2016	0.2016	0.2016
25	0.2016	0.2016	0.2016	0.2016	0.2016	0.2016	0.2016
26	0.2016	0.2016	0.2016	0.2016	0.2016	0.2016	0.2016

Estimated V Correlation Matrix for id 1

Row	Col8	Col9	Col10	Col11	Col12	Col13	Col14
1	0.2016	0.2016	0.2016	0.2016	0.2016	0.2016	0.2016
2	0.2016	0.2016	0.2016	0.2016	0.2016	0.2016	0.2016
3	0.2016	0.2016	0.2016	0.2016	0.2016	0.2016	0.2016
4	0.2016	0.2016	0.2016	0.2016	0.2016	0.2016	0.2016
5	0.2016	0.2016	0.2016	0.2016	0.2016	0.2016	0.2016
6	0.2016	0.2016	0.2016	0.2016	0.2016	0.2016	0.2016
7	0.2016	0.2016	0.2016	0.2016	0.2016	0.2016	0.2016
8	1.0000	0.2016	0.2016	0.2016	0.2016	0.2016	0.2016
9	0.2016	1.0000	0.2016	0.2016	0.2016	0.2016	0.2016
10	0.2016	0.2016	1.0000	0.2016	0.2016	0.2016	0.2016
11	0.2016	0.2016	0.2016	1.0000	0.2016	0.2016	0.2016
12	0.2016	0.2016	0.2016	0.2016	1.0000	0.2016	0.2016
13	0.2016	0.2016	0.2016	0.2016	0.2016	1.0000	0.2016
14	0.2016	0.2016	0.2016	0.2016	0.2016	0.2016	1.0000
15	0.2016	0.2016	0.2016	0.2016	0.2016	0.2016	0.2016
16	0.2016	0.2016	0.2016	0.2016	0.2016	0.2016	0.2016
17	0.2016	0.2016	0.2016	0.2016	0.2016	0.2016	0.2016
18	0.2016	0.2016	0.2016	0.2016	0.2016	0.2016	0.2016

19	0.2016	0.2016	0.2016	0.2016	0.2016	0.2016	0.2016
20	0.2016	0.2016	0.2016	0.2016	0.2016	0.2016	0.2016
21	0.2016	0.2016	0.2016	0.2016	0.2016	0.2016	0.2016
22	0.2016	0.2016	0.2016	0.2016	0.2016	0.2016	0.2016
23	0.2016	0.2016	0.2016	0.2016	0.2016	0.2016	0.2016
24	0.2016	0.2016	0.2016	0.2016	0.2016	0.2016	0.2016
25	0.2016	0.2016	0.2016	0.2016	0.2016	0.2016	0.2016
26	0.2016	0.2016	0.2016	0.2016	0.2016	0.2016	0.2016

Estimated V Correlation Matrix for id 1

Row	Col15	Col16	Col17	Col18	Col19	Col20	Col21
1	0.2016	0.2016	0.2016	0.2016	0.2016	0.2016	0.2016
2	0.2016	0.2016	0.2016	0.2016	0.2016	0.2016	0.2016
3	0.2016	0.2016	0.2016	0.2016	0.2016	0.2016	0.2016
4	0.2016	0.2016	0.2016	0.2016	0.2016	0.2016	0.2016
5	0.2016	0.2016	0.2016	0.2016	0.2016	0.2016	0.2016
6	0.2016	0.2016	0.2016	0.2016	0.2016	0.2016	0.2016
7	0.2016	0.2016	0.2016	0.2016	0.2016	0.2016	0.2016
8	0.2016	0.2016	0.2016	0.2016	0.2016	0.2016	0.2016
9	0.2016	0.2016	0.2016	0.2016	0.2016	0.2016	0.2016
10	0.2016	0.2016	0.2016	0.2016	0.2016	0.2016	0.2016
11	0.2016	0.2016	0.2016	0.2016	0.2016	0.2016	0.2016
12	0.2016	0.2016	0.2016	0.2016	0.2016	0.2016	0.2016
13	0.2016	0.2016	0.2016	0.2016	0.2016	0.2016	0.2016
14	0.2016	0.2016	0.2016	0.2016	0.2016	0.2016	0.2016
15	1.0000	0.2016	0.2016	0.2016	0.2016	0.2016	0.2016
16	0.2016	1.0000	0.2016	0.2016	0.2016	0.2016	0.2016
17	0.2016	0.2016	1.0000	0.2016	0.2016	0.2016	0.2016
18	0.2016	0.2016	0.2016	1.0000	0.2016	0.2016	0.2016
19	0.2016	0.2016	0.2016	0.2016	1.0000	0.2016	0.2016
20	0.2016	0.2016	0.2016	0.2016	0.2016	1.0000	0.2016
21	0.2016	0.2016	0.2016	0.2016	0.2016	0.2016	1.0000
22	0.2016	0.2016	0.2016	0.2016	0.2016	0.2016	0.2016
23	0.2016	0.2016	0.2016	0.2016	0.2016	0.2016	0.2016
24	0.2016	0.2016	0.2016	0.2016	0.2016	0.2016	0.2016
25	0.2016	0.2016	0.2016	0.2016	0.2016	0.2016	0.2016
26	0.2016	0.2016	0.2016	0.2016	0.2016	0.2016	0.2016

Estimated V Correlation Matrix for id 1

Row	Col22	Col23	Col24	Col25	Col26
1	0.2016	0.2016	0.2016	0.2016	0.2016
2	0.2016	0.2016	0.2016	0.2016	0.2016
3	0.2016	0.2016	0.2016	0.2016	0.2016
4	0.2016	0.2016	0.2016	0.2016	0.2016
5	0.2016	0.2016	0.2016	0.2016	0.2016
6	0.2016	0.2016	0.2016	0.2016	0.2016
7	0.2016	0.2016	0.2016	0.2016	0.2016
8	0.2016	0.2016	0.2016	0.2016	0.2016
9	0.2016	0.2016	0.2016	0.2016	0.2016
10	0.2016	0.2016	0.2016	0.2016	0.2016

11	0.2016	0.2016	0.2016	0.2016	0.2016
12	0.2016	0.2016	0.2016	0.2016	0.2016
13	0.2016	0.2016	0.2016	0.2016	0.2016
14	0.2016	0.2016	0.2016	0.2016	0.2016
15	0.2016	0.2016	0.2016	0.2016	0.2016
16	0.2016	0.2016	0.2016	0.2016	0.2016
17	0.2016	0.2016	0.2016	0.2016	0.2016
18	0.2016	0.2016	0.2016	0.2016	0.2016
19	0.2016	0.2016	0.2016	0.2016	0.2016
20	0.2016	0.2016	0.2016	0.2016	0.2016
21	0.2016	0.2016	0.2016	0.2016	0.2016
22	1.0000	0.2016	0.2016	0.2016	0.2016
23	0.2016	1.0000	0.2016	0.2016	0.2016
24	0.2016	0.2016	1.0000	0.2016	0.2016
25	0.2016	0.2016	0.2016	1.0000	0.2016
26	0.2016	0.2016	0.2016	0.2016	1.0000

Covariance Parameter Estimates

Cov Parm	Subject	Estimate
UN(1,1)	id	42.6704
Residual		168.99

Fit Statistics

-2 Log Likelihood	6275.5
AIC (Smaller is Better)	6331.5
AICC (Smaller is Better)	6333.7
BIC (Smaller is Better)	6370.8

Null Model Likelihood Ratio Test

DF	Chi-Square	Pr > ChiSq
1	114.90	<.0001

Solution for Fixed Effects

Effect	day	time	Standard				
			Estimate	Error	DF	t Value	
day		6	42.2900	2.6562	725	15.92	
day		1	38.0867	2.6562	725	14.34	
day*time		6	2	1.5567	3.3565	725	0.46
day*time		6	3	5.1367	3.3565	725	1.53
day*time		6	4	3.4267	3.3565	725	1.02
day*time		6	5	2.0700	3.3565	725	0.62
day*time		6	6	0.9300	3.3565	725	0.28
day*time		6	7	1.6633	3.3565	725	0.50
day*time		6	8	2.9500	3.3565	725	0.88
day*time		6	9	-3.6933	3.3565	725	-1.10
day*time		6	10	-4.8867	3.3565	725	-1.46
day*time		6	11	-10.2833	3.3565	725	-3.06

day*time	6	12	-14.6267	3.3565	725	-4.36
day*time	6	13	-19.0867	3.3565	725	-5.69
day*time	6	1	0	.	.	.
day*time	1	2	-0.8400	3.3565	725	-0.25
day*time	1	3	0.2067	3.3565	725	0.06
day*time	1	4	1.0167	3.3565	725	0.30
day*time	1	5	3.5233	3.3565	725	1.05
day*time	1	6	8.0800	3.3565	725	2.41
day*time	1	7	8.8467	3.3565	725	2.64
day*time	1	8	6.2367	3.3565	725	1.86
day*time	1	9	8.7600	3.3565	725	2.61
day*time	1	10	16.7133	3.3565	725	4.98
day*time	1	11	15.6033	3.3565	725	4.65
day*time	1	12	16.2300	3.3565	725	4.84
day*time	1	13	25.2067	3.3565	725	7.51
day*time	1	1	0	.	.	.

Solution for Fixed Effects

Effect	day	time	Pr > t
day	6		<.0001
day	1		<.0001
day*time	6	2	0.6429
day*time	6	3	0.1264
day*time	6	4	0.3076
day*time	6	5	0.5376
day*time	6	6	0.7818
day*time	6	7	0.6204
day*time	6	8	0.3798
day*time	6	9	0.2715
day*time	6	10	0.1459
day*time	6	11	0.0023
day*time	6	12	<.0001
day*time	6	13	<.0001
day*time	6	1	.
day*time	1	2	0.8025
day*time	1	3	0.9509
day*time	1	4	0.7621
day*time	1	5	0.2942
day*time	1	6	0.0163
day*time	1	7	0.0086
day*time	1	8	0.0636
day*time	1	9	0.0092
day*time	1	10	<.0001
day*time	1	11	<.0001
day*time	1	12	<.0001
day*time	1	13	<.0001
day*time	1	1	.

Solution for Random Effects

Effect	id	Estimate	Std Err	Pred	DF	t Value	Pr > t
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Intercept	1	-2.2709	2.6220	725	-0.87	0.3867
Intercept	2	8.4666	2.6220	725	3.23	0.0013
Intercept	3	-3.0152	2.6220	725	-1.15	0.2505
Intercept	4	0.9600	2.6220	725	0.37	0.7144
Intercept	5	-6.8236	2.6220	725	-2.60	0.0094
Intercept	6	8.3298	2.6220	725	3.18	0.0016
Intercept	7	-1.3563	2.6220	725	-0.52	0.6051
Intercept	8	-4.2902	2.6220	725	-1.64	0.1022
Intercept	9	-2.6848	2.6220	725	-1.02	0.3062
Intercept	10	-0.09134	2.6220	725	-0.03	0.9722
Intercept	11	0.6229	2.6220	725	0.24	0.8123
Intercept	12	6.8645	2.6220	725	2.62	0.0090
Intercept	13	4.5848	2.6220	725	1.75	0.0808
Intercept	14	-4.9010	2.6220	725	-1.87	0.0620
Intercept	15	-2.7549	2.6220	725	-1.05	0.2938
Intercept	16	-7.0472	2.6220	725	-2.69	0.0074
Intercept	17	-9.0298	2.6220	725	-3.44	0.0006
Intercept	18	12.7423	2.6220	725	4.86	<.0001
Intercept	19	-0.2315	2.6220	725	-0.09	0.9297
Intercept	20	0.9167	2.6220	725	0.35	0.7267
Intercept	21	9.9352	2.6220	725	3.79	0.0002
Intercept	22	-5.7221	2.6220	725	-2.18	0.0294
Intercept	23	-7.4477	2.6220	725	-2.84	0.0046
Intercept	24	6.7110	2.6220	725	2.56	0.0107
Intercept	25	-9.5238	2.6220	725	-3.63	0.0003
Intercept	26	-2.2609	2.6220	725	-0.86	0.3888
Intercept	27	3.9840	2.6220	725	1.52	0.1291
Intercept	28	11.1702	2.6220	725	4.26	<.0001
Intercept	29	-2.3777	2.6220	725	-0.91	0.3648
Intercept	30	-3.4591	2.6220	725	-1.32	0.1875

Type 3 Tests of Fixed Effects

Effect	Num DF	Den DF	F Value	Pr > F
day	2	725	593.23	<.0001
day*time	24	725	10.77	<.0001

Model 3a - treating time as continuous, fitting time

The Mixed Procedure

Model Information

Data Set	WORK.DAT
Dependent Variable	p1np
Covariance Structure	Unstructured @ Compound Symmetry
Subject Effect	id
Estimation Method	ML

Residual Variance Method	None
Fixed Effects SE Method	Model-Based
Degrees of Freedom Method	Between-Within

Class Level Information

Class	Levels	Values
id	30	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
day	2	1 6
time	13	1 2 3 4 5 6 7 8 9 10 11 12 13

Dimensions

Covariance Parameters	4
Columns in X	4
Columns in Z	0
Subjects	30
Max Obs per Subject	26

Number of Observations

Number of Observations Read	780
Number of Observations Used	780
Number of Observations Not Used	0

Iteration History

Iteration	Evaluations	-2 Log Like	Criterion
0	1	6432.01662778	
1	2	6351.54733861	0.00022586
2	1	6350.95539276	0.00000300
3	1	6350.94793505	0.00000000

Convergence criteria met.

Covariance Parameter Estimates

Cov Parm	Subject	Estimate
day UN(1,1)	id	222.76
UN(2,1)	id	20.4460
UN(2,2)	id	218.49
time Corr	id	0.1716

Fit Statistics

-2 Log Likelihood	6350.9
AIC (Smaller is Better)	6366.9
AICC (Smaller is Better)	6367.1
BIC (Smaller is Better)	6378.2

Null Model Likelihood Ratio Test

DF	Chi-Square	Pr > ChiSq
3	81.07	<.0001

Solution for Fixed Effects

Effect	day	Estimate	Standard Error	DF	t Value	Pr > t
day	1	32.9047	1.8449	28	17.84	<.0001
day	6	50.8237	1.8271	28	27.82	<.0001
timec*day	1	1.9445	0.1838	746	10.58	<.0001
timec*day	6	-1.6020	0.1821	746	-8.80	<.0001

Type 3 Tests of Fixed Effects

Effect	Num DF	Den DF	F Value	Pr > F
day	2	28	504.29	<.0001
timec*day	2	746	104.17	<.0001

Model 3b - treating time as continuous, fitting time²

The Mixed Procedure

Model Information

Data Set	WORK.DAT
Dependent Variable	p1np
Covariance Structure	Unstructured @ Compound Symmetry
Subject Effect	id
Estimation Method	REML
Residual Variance Method	None
Fixed Effects SE Method	Model-Based
Degrees of Freedom Method	Between-Within

Class Level Information

Class	Levels	Values
id	30	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
day	2	1 6
time	13	1 2 3 4 5 6 7 8 9 10 11 12 13

Dimensions

Covariance Parameters	4
Columns in X	6
Columns in Z	0
Subjects	30
Max Obs per Subject	26

Number of Observations

Number of Observations Read	780
Number of Observations Used	780
Number of Observations Not Used	0

Iteration History

Iteration	Evaluations	-2 Res Log Like	Criterion
0	1	6409.48939917	
1	2	6316.75432825	0.00025609
2	1	6316.08122568	0.00000442
3	1	6316.07024609	0.00000000

Convergence criteria met.

Covariance Parameter Estimates

Cov Parm	Subject	Estimate
day UN(1,1)	id	223.80
UN(2,1)	id	27.0273
UN(2,2)	id	203.78
time Corr	id	0.1826

Fit Statistics

-2 Res Log Likelihood	6316.1
AIC (Smaller is Better)	6324.1
AICC (Smaller is Better)	6324.1
BIC (Smaller is Better)	6329.7

Null Model Likelihood Ratio Test

DF	Chi-Square	Pr > ChiSq
3	93.42	<.0001

Solution for Fixed Effects

Effect	day	Estimate	Standard Error	DF	t Value	Pr > t
day	1	36.9957	2.6841	28	13.78	<.0001
day	6	39.9118	2.5612	28	15.58	<.0001
timec*day	1	0.3081	0.7940	744	0.39	0.6981

timec*day	6	2.7628	0.7577	744	3.65	0.0003
timec*timec*day	1	0.1169	0.05519	744	2.12	0.0345
timec*timec*day	6	-0.3118	0.05266	744	-5.92	<.0001

Type 3 Tests of Fixed Effects

Effect	Num DF	Den DF	F Value	Pr > F
day	2	28	192.31	<.0001
timec*day	2	744	6.65	0.0014
timec*timec*day	2	744	21.70	<.0001

Contrasts

Label	Num DF	Den DF	F Value	Pr > F
no interaction between time and day	2	744	130.53	<.0001