\* Encoding: UTF-8.

TITLE "RDS01".

RDS01

GET DATA

/TYPE=XLSX

/FILE='.\rds01.xlsx'

/SHEET=name 'rds01'

/CELLRANGE=FULL

/READNAMES=ON

/LEADINGSPACES IGNORE=YES

/TRAILINGSPACES IGNORE=YES

/DATATYPEMIN PERCENTAGE=95.0

/HIDDEN IGNORE=YES.

EXECUTE.

DATASET NAME pkdataset WINDOW=FRONT.

COMPUTE lnpk=ln(PK).

EXECUTE.

UNIANOVA lnpk BY period sequence treatment subject

/RANDOM subject

/CONTRAST(treatment)=Simple(1)

/METHOD=SSTYPE(3)

/INTERCEPT=INCLUDE

/CRITERIA=ALPHA(0.05)

/DESIGN=period sequence treatment subject(sequence).

Univariate Analysis of Variance

|  |  |  |
| --- | --- | --- |
| **Notes** | | |
| Output Created | | 28-FEB-2021 17:54:28 |
| Comments | |  |
| Input | Active Dataset | pkdataset |
| Filter | <none> |
| Weight | <none> |
| Split File | <none> |
| N of Rows in Working Data File | 298 |
| Missing Value Handling | Definition of Missing | User-defined missing values are treated as missing. |
| Cases Used | Statistics are based on all cases with valid data for all variables in the model. |
| Syntax | | UNIANOVA lnpk BY period sequence treatment subject  /RANDOM subject  /CONTRAST(treatment)=Simple(1)  /METHOD=SSTYPE(3)  /INTERCEPT=INCLUDE  /CRITERIA=ALPHA(0.05)  /DESIGN=period sequence treatment subject(sequence). |
| Resources | Processor Time | 00:00:00.03 |
| Elapsed Time | 00:00:00.04 |

|  |  |  |
| --- | --- | --- |
| **Between-Subjects Factors** | | |
|  | | **N** |
| period | 1 | 77 |
| 2 | 76 |
| 3 | 70 |
| 4 | 75 |
| sequence | RTRT | 149 |
| TRTR | 149 |
| treatment | R | 150 |
| T | 148 |
| subject | 1 | 4 |
| 2 | 4 |
| 3 | 4 |
| 4 | 4 |
| 5 | 4 |
| 6 | 4 |
| 7 | 4 |
| 8 | 4 |
| 9 | 4 |
| 10 | 4 |
| 11 | 3 |
| 12 | 4 |
| 13 | 4 |
| 14 | 4 |
| 15 | 4 |
| 16 | 4 |
| 17 | 4 |
| 18 | 4 |
| 19 | 4 |
| 20 | 3 |
| 21 | 4 |
| 22 | 4 |
| 23 | 4 |
| 24 | 3 |
| 25 | 4 |
| 26 | 4 |
| 27 | 4 |
| 28 | 4 |
| 29 | 4 |
| 30 | 4 |
| 31 | 3 |
| 32 | 4 |
| 33 | 4 |
| 34 | 4 |
| 35 | 4 |
| 36 | 4 |
| 37 | 4 |
| 38 | 4 |
| 39 | 4 |
| 40 | 4 |
| 41 | 4 |
| 42 | 3 |
| 43 | 4 |
| 44 | 4 |
| 45 | 4 |
| 46 | 4 |
| 47 | 4 |
| 48 | 4 |
| 49 | 4 |
| 50 | 4 |
| 51 | 4 |
| 52 | 4 |
| 53 | 4 |
| 54 | 4 |
| 55 | 4 |
| 56 | 4 |
| 57 | 4 |
| 58 | 4 |
| 59 | 4 |
| 60 | 4 |
| 62 | 4 |
| 63 | 4 |
| 64 | 4 |
| 65 | 4 |
| 66 | 4 |
| 67 | 2 |
| 68 | 4 |
| 69 | 3 |
| 70 | 4 |
| 71 | 2 |
| 72 | 4 |
| 73 | 4 |
| 74 | 4 |
| 75 | 4 |
| 76 | 4 |
| 77 | 4 |
| 78 | 4 |

|  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- |
| **Tests of Between-Subjects Effects** | | | | | | |
| Dependent Variable: lnpk | | | | | | |
| Source | | **Type III Sum of Squares** | **df** | **Mean Square** | **F** | **Sig.** |
| Intercept | Hypothesis | 17499.273 | 1 | 17499.273 | 6243.584 | .000 |
| Error | 210.673 | 75.166 | 2.8031 |  |  |
| period | Hypothesis | .375 | 3 | .125 | .781 | .506 |
| Error | 34.719 | 217 | .1602 |  |  |
| sequence | Hypothesis | .039 | 1 | .039 | .014 | .907 |
| Error | 211.073 | 75.147 | 2.8093 |  |  |
| treatment | Hypothesis | 1.565 | 1 | 1.565 | 9.784 | .002 |
| Error | 34.719 | 217 | .1602 |  |  |
| subject(sequence) | Hypothesis | 214.130 | 75 | 2.855 | 17.845 | .000 |
| Error | 34.719 | 217 | .1602 |  |  |

|  |
| --- |
| 1. .981 MS(subject(sequence)) + .019 MS(Error) |
| 2. MS(Error) |
| 3. .983 MS(subject(sequence)) + .017 MS(Error) |

|  |  |  |  |
| --- | --- | --- | --- |
| **Expected Mean Squares1,2** | | | |
| Source | **Variance Component** | | |
| **Var(subject(sequence))** | **Var(Error)** | **Quadratic Term** |
| Intercept | 3.793 | 1.000 | Intercept, period, sequence, treatment |
| period | .000 | 1.000 | period |
| sequence | 3.801 | 1.000 | sequence |
| treatment | .000 | 1.000 | treatment |
| subject(sequence) | 3.868 | 1.000 |  |
| Error | .000 | 1.000 |  |

|  |
| --- |
| 1. For each source, the expected mean square equals the sum of the coefficients in the cells times the variance components, plus a quadratic term involving effects in the Quadratic Term cell. |
| 2. Expected Mean Squares are based on the Type III Sums of Squares. |

Custom Hypothesis Tests

|  |  |  |  |
| --- | --- | --- | --- |
| **Contrast Results (K Matrix)** | | | |
| treatment Simple Contrast1 | | | **Dependent Variable** |
| **lnpk** |
| Level 2 vs. Level 1 | Contrast Estimate | | .145 |
| Hypothesized Value | | 0 |
| Difference (Estimate - Hypothesized) | | .145 |
| Std. Error | | .047 |
| Sig. | | .002 |
| 95% Confidence Interval for Difference | Lower Bound | .054 |
| Upper Bound | .237 |

|  |
| --- |
| 1. Reference category = 1 |

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| **Test Results** | | | | | |
| Dependent Variable: lnpk | | | | | |
| Source | **Sum of Squares** | **df** | **Mean Square** | **F** | **Sig.** |
| Contrast | 1.565 | 1 | 1.565 | 9.784 | .002 |
| Error | 34.719 | 217 | .160 |  |  |

MIXED lnpk BY period sequence treatment subject

/CRITERIA=DFMETHOD(SATTERTHWAITE) CIN(95) MXITER(100) MXSTEP(10) SCORING(1)

SINGULAR(0.000000000001) HCONVERGE(0, ABSOLUTE) LCONVERGE(0, ABSOLUTE) PCONVERGE(0.000001, ABSOLUTE)

/FIXED=period sequence treatment | SSTYPE(3)

/METHOD=REML

/RANDOM= subject(sequence) | COVTYPE(ID)

/EMMEANS=TABLES(treatment) COMPARE REFCAT(FIRST) ADJ(LSD).

Mixed Model Analysis

|  |  |  |
| --- | --- | --- |
| **Notes** | | |
| Output Created | | 28-FEB-2021 17:54:28 |
| Comments | |  |
| Input | Active Dataset | pkdataset |
| Filter | <none> |
| Weight | <none> |
| Split File | <none> |
| N of Rows in Working Data File | 298 |
| Missing Value Handling | Definition of Missing | User-defined missing values are treated as missing. |
| Cases Used | Statistics are based on all cases with valid data for all variables in the model. |
| Syntax | | MIXED lnpk BY period sequence treatment subject  /CRITERIA=DFMETHOD(SATTERTHWAITE) CIN(95) MXITER(100) MXSTEP(10) SCORING(1)  SINGULAR(0.000000000001) HCONVERGE(0, ABSOLUTE) LCONVERGE(0, ABSOLUTE) PCONVERGE(0.000001, ABSOLUTE)  /FIXED=period sequence treatment | SSTYPE(3)  /METHOD=REML  /RANDOM= subject(sequence) | COVTYPE(ID)  /EMMEANS=TABLES(treatment) COMPARE REFCAT(FIRST) ADJ(LSD). |
| Resources | Processor Time | 00:00:00.16 |
| Elapsed Time | 00:00:00.32 |

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| **Model Dimension1** | | | | |
|  | | **Number of Levels** | **Covariance Structure** | **Number of Parameters** |
| Fixed Effects | Intercept | 1 |  | 1 |
| period | 4 |  | 3 |
| sequence | 2 |  | 1 |
| treatment | 2 |  | 1 |
| Random Effects | subject(sequence) | 77 | Identity | 1 |
| Residual | |  |  | 1 |
| Total | | 86 |  | 8 |

|  |
| --- |
| 1. Dependent Variable: lnpk. |

|  |  |
| --- | --- |
| **Information Criteria1** | |
| -2 Restricted Log Likelihood | 536.20114880 |
| Akaike's Information Criterion (AIC) | 540.20114880 |
| Hurvich and Tsai's Criterion (AICC) | 540.24267129 |
| Bozdogan's Criterion (CAIC) | 549.55465640 |
| Schwarz's Bayesian Criterion (BIC) | 547.55465640 |

|  |
| --- |
| The information criteria are displayed in smaller-is-better form.1 |
| 1. Dependent Variable: lnpk. |

Fixed Effects

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| **Type III Tests of Fixed Effects1** | | | | |
| Source | **Numerator df** | **Denominator df** | **F** | **Sig.** |
| Intercept | 1 | 74.738 | 6161.892 | .000 |
| period | 3 | 217.118 | .829 | .479 |
| sequence | 1 | 74.721 | .012 | .913 |
| treatment | 1 | 216.939 | 9.865 | .002 |

|  |
| --- |
| 1. Dependent Variable: lnpk. |

Covariance Parameters

|  |  |  |  |
| --- | --- | --- | --- |
| **Estimates of Covariance Parameters1** | | | |
| Parameter | | **Estimate** | **Std. Error** |
| Residual | | .160100 | .015379 |
| subject(sequence) | Variance | .706938 | .122602 |

|  |
| --- |
| 1. Dependent Variable: lnpk. |

Estimated Marginal Means

treatment

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| **Estimates1** | | | | | |
| treatment | **Mean** | **Std. Error** | **df** | **95% Confidence Interval** | |
| **Lower Bound** | **Upper Bound** |
| R | 7.670 | .101 | 83.037 | 7.469 | 7.871 |
| T | 7.816 | .101 | 83.355 | 7.614 | 8.018 |

|  |
| --- |
| 1. Dependent Variable: lnpk. |

|  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- |
| **Pairwise Comparisons1** | | | | | | |
| (I) treatment | (J) treatment | **Mean Difference (I-J)** | **Std. Error** | **df** | **Sig.3** | **95% Confidence Interval for Difference3** |
| **Lower Bound** |
| T | R | .14608818\* | .04651301 | 216.93862184 | .00191967 | .05441293 |

|  |  |  |
| --- | --- | --- |
| **Pairwise Comparisons1** | | |
| (I) treatment | (J) treatment | 95% Confidence Interval for Difference |
| **Upper Bound** |
| T | R | .23776343 |

|  |
| --- |
| Based on estimated marginal means1 |
| \*. The mean difference is significant at the .05 level. |
| 1. Dependent Variable: lnpk. |
| 3. Adjustment for multiple comparisons: Least Significant Difference (equivalent to no adjustments). |

|  |  |  |  |
| --- | --- | --- | --- |
| **Univariate Tests1** | | | |
| **Numerator df** | **Denominator df** | **F** | **Sig.** |
| 1 | 216.939 | 9.865 | .002 |

|  |
| --- |
| The F tests the effect of treatment. This test is based on the linearly independent pairwise comparisons among the estimated marginal means.1 |
| 1. Dependent Variable: lnpk. |

MIXED lnpk BY period treatment sequence subject

/CRITERIA=CIN(90) MXITER(200) MXSTEP(20) SCORING(2) SINGULAR(0.000000000001) HCONVERGE(0,

RELATIVE) LCONVERGE(0.0000000000001, RELATIVE) PCONVERGE(0, RELATIVE)

/FIXED=period treatment sequence | SSTYPE(3)

/METHOD=REML

/RANDOM=treatment | SUBJECT(subject) COVTYPE(CSH)

/REPEATED=treatment | SUBJECT(subject\*period) COVTYPE(DIAG)

/EMMEANS=TABLES(treatment) COMPARE REFCAT(FIRST) ADJ(LSD).

Mixed Model Analysis

|  |  |  |
| --- | --- | --- |
| **Notes** | | |
| Output Created | | 28-FEB-2021 17:54:28 |
| Comments | |  |
| Input | Active Dataset | pkdataset |
| Filter | <none> |
| Weight | <none> |
| Split File | <none> |
| N of Rows in Working Data File | 298 |
| Missing Value Handling | Definition of Missing | User-defined missing values are treated as missing. |
| Cases Used | Statistics are based on all cases with valid data for all variables in the model. |
| Syntax | | MIXED lnpk BY period treatment sequence subject  /CRITERIA=CIN(90) MXITER(200) MXSTEP(20) SCORING(2) SINGULAR(0.000000000001) HCONVERGE(0,  RELATIVE) LCONVERGE(0.0000000000001, RELATIVE) PCONVERGE(0, RELATIVE)  /FIXED=period treatment sequence | SSTYPE(3)  /METHOD=REML  /RANDOM=treatment | SUBJECT(subject) COVTYPE(CSH)  /REPEATED=treatment | SUBJECT(subject\*period) COVTYPE(DIAG)  /EMMEANS=TABLES(treatment) COMPARE REFCAT(FIRST) ADJ(LSD). |
| Resources | Processor Time | 00:00:00.13 |
| Elapsed Time | 00:00:00.15 |

|  |
| --- |
| **Warnings** |
| The final Hessian matrix is not positive definite although all convergence criteria are satisfied. The MIXED procedure continues despite this warning. Validity of subsequent results cannot be ascertained. |

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| **Model Dimension1** | | | | | |
|  | | **Number of Levels** | **Covariance Structure** | **Number of Parameters** | **Subject Variables** |
| Fixed Effects | Intercept | 1 |  | 1 |  |
| period | 4 |  | 3 |  |
| treatment | 2 |  | 1 |  |
| sequence | 2 |  | 1 |  |
| Random Effects | treatment | 2 | Heterogeneous Compound Symmetry | 3 | subject |
| Repeated Effects | treatment | 2 | Diagonal | 2 | subject \* period |
| Total | | 13 |  | 11 |  |

|  |  |  |
| --- | --- | --- |
| **Model Dimension1** | | |
|  | | **Number of Subjects** |
| Fixed Effects | Intercept |  |
| period |  |
| treatment |  |
| sequence |  |
| Random Effects | treatment |  |
| Repeated Effects | treatment | 298 |
| Total | |  |

|  |
| --- |
| 1. Dependent Variable: lnpk. |

|  |  |
| --- | --- |
| **Information Criteria1** | |
| -2 Restricted Log Likelihood | 530.14451859 |
| Akaike's Information Criterion (AIC) | 540.14451859 |
| Hurvich and Tsai's Criterion (AICC) | 540.35430880 |
| Bozdogan's Criterion (CAIC) | 563.52828760 |
| Schwarz's Bayesian Criterion (BIC) | 558.52828760 |

|  |
| --- |
| The information criteria are displayed in smaller-is-better form.1 |
| 1. Dependent Variable: lnpk. |

Fixed Effects

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| **Type III Tests of Fixed Effects1** | | | | |
| Source | **Numerator df** | **Denominator df** | **F** | **Sig.** |
| Intercept | 1 | 63.979 | 6165.029 | .000 |
| period | 3 | 208.598 | .545 | .652 |
| treatment | 1 | 209.534 | 9.786 | .002 |
| sequence | 1 | 63.967 | .011 | .918 |

|  |
| --- |
| 1. Dependent Variable: lnpk. |

Covariance Parameters

|  |  |  |  |
| --- | --- | --- | --- |
| **Estimates of Covariance Parameters1** | | | |
| Parameter | | **Estimate** | **Std. Error** |
| Repeated Measures | Var: [treatment=R] | .202 | .029 |
| Var: [treatment=T] | .117 | .019 |
| treatment [subject = subject] | Var: [treatment=R] | .728 | .136 |
| Var: [treatment=T] | .686 | .123 |
| CSH rho | 1.0002 | .000 |

|  |
| --- |
| 1. Dependent Variable: lnpk. |
| 2. This covariance parameter is redundant. |

Estimated Marginal Means

treatment

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| **Estimates1** | | | | | |
| treatment | **Mean** | **Std. Error** | **df** | **90% Confidence Interval** | |
| **Lower Bound** | **Upper Bound** |
| R | 7.670 | .104 | 74.785 | 7.497 | 7.844 |
| T | 7.816 | .099 | 66.870 | 7.651 | 7.980 |

|  |
| --- |
| 1. Dependent Variable: lnpk. |

|  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- |
| **Pairwise Comparisons1** | | | | | | |
| (I) treatment | (J) treatment | **Mean Difference (I-J)** | **Std. Error** | **df** | **Sig.3** | **90% Confidence Interval for Difference3** |
| **Lower Bound** |
| T | R | .14546428\* | .04650124 | 209.53423877 | .00200912 | .06863688 |

|  |  |  |
| --- | --- | --- |
| **Pairwise Comparisons1** | | |
| (I) treatment | (J) treatment | 90% Confidence Interval for Difference |
| **Upper Bound** |
| T | R | .22229168 |

|  |
| --- |
| Based on estimated marginal means1 |
| \*. The mean difference is significant at the .10 level. |
| 1. Dependent Variable: lnpk. |
| 3. Adjustment for multiple comparisons: Least Significant Difference (equivalent to no adjustments). |

|  |  |  |  |
| --- | --- | --- | --- |
| **Univariate Tests1** | | | |
| **Numerator df** | **Denominator df** | **F** | **Sig.** |
| 1 | 209.534 | 9.786 | .002 |

|  |
| --- |
| The F tests the effect of treatment. This test is based on the linearly independent pairwise comparisons among the estimated marginal means.1 |
| 1. Dependent Variable: lnpk. |

DATASET CLOSE pkdataset.

TITLE "RDS02".

RDS02

GET DATA

/TYPE=XLSX

/FILE='.\rds01.xlsx'

/SHEET=name 'rds02'

/CELLRANGE=FULL

/READNAMES=ON

/LEADINGSPACES IGNORE=YES

/TRAILINGSPACES IGNORE=YES

/DATATYPEMIN PERCENTAGE=95.0

/HIDDEN IGNORE=YES.

EXECUTE.

DATASET NAME pkdataset WINDOW=FRONT.

COMPUTE lnpk=ln(PK).

EXECUTE.

UNIANOVA lnpk BY period sequence treatment subject

/RANDOM subject

/CONTRAST(treatment)=Simple(1)

/METHOD=SSTYPE(3)

/INTERCEPT=INCLUDE

/CRITERIA=ALPHA(0.05)

/DESIGN=period sequence treatment subject(sequence).

Univariate Analysis of Variance

|  |  |  |
| --- | --- | --- |
| **Notes** | | |
| Output Created | | 28-FEB-2021 17:54:29 |
| Comments | |  |
| Input | Active Dataset | pkdataset |
| Filter | <none> |
| Weight | <none> |
| Split File | <none> |
| N of Rows in Working Data File | 72 |
| Missing Value Handling | Definition of Missing | User-defined missing values are treated as missing. |
| Cases Used | Statistics are based on all cases with valid data for all variables in the model. |
| Syntax | | UNIANOVA lnpk BY period sequence treatment subject  /RANDOM subject  /CONTRAST(treatment)=Simple(1)  /METHOD=SSTYPE(3)  /INTERCEPT=INCLUDE  /CRITERIA=ALPHA(0.05)  /DESIGN=period sequence treatment subject(sequence). |
| Resources | Processor Time | 00:00:00.00 |
| Elapsed Time | 00:00:00.04 |

|  |  |  |
| --- | --- | --- |
| **Between-Subjects Factors** | | |
|  | | **N** |
| period | 1 | 24 |
| 2 | 24 |
| 3 | 24 |
| sequence | RRT | 24 |
| RTR | 24 |
| TRR | 24 |
| treatment | R | 48 |
| T | 24 |
| subject | 1 | 3 |
| 2 | 3 |
| 3 | 3 |
| 4 | 3 |
| 5 | 3 |
| 6 | 3 |
| 7 | 3 |
| 8 | 3 |
| 9 | 3 |
| 10 | 3 |
| 11 | 3 |
| 12 | 3 |
| 13 | 3 |
| 14 | 3 |
| 15 | 3 |
| 16 | 3 |
| 17 | 3 |
| 18 | 3 |
| 19 | 3 |
| 20 | 3 |
| 21 | 3 |
| 22 | 3 |
| 23 | 3 |
| 24 | 3 |

|  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- |
| **Tests of Between-Subjects Effects** | | | | | | |
| Dependent Variable: lnpk | | | | | | |
| Source | | **Type III Sum of Squares** | **df** | **Mean Square** | **F** | **Sig.** |
| Intercept | Hypothesis | 4062.440 | 1 | 4062.440 | 32145.948 | .000 |
| Error | 2.720 | 21.524 | .1261 |  |  |
| period | Hypothesis | .040 | 2 | .020 | 1.420 | .252 |
| Error | .628 | 45 | .0142 |  |  |
| sequence | Hypothesis | .024 | 2 | .012 | .085 | .919 |
| Error | 2.949 | 21 | .1403 |  |  |
| treatment | Hypothesis | .008 | 1 | .008 | .575 | .452 |
| Error | .628 | 45 | .0142 |  |  |
| subject(sequence) | Hypothesis | 2.949 | 21 | .140 | 10.061 | .000 |
| Error | .628 | 45 | .0142 |  |  |

|  |
| --- |
| 1. .889 MS(subject(sequence)) + .111 MS(Error) |
| 2. MS(Error) |
| 3. MS(subject(sequence)) |

|  |  |  |  |
| --- | --- | --- | --- |
| **Expected Mean Squares1,2** | | | |
| Source | **Variance Component** | | |
| **Var(subject(sequence))** | **Var(Error)** | **Quadratic Term** |
| Intercept | 2.667 | 1.000 | Intercept, period, sequence, treatment |
| period | .000 | 1.000 | period |
| sequence | 3.000 | 1.000 | sequence |
| treatment | .000 | 1.000 | treatment |
| subject(sequence) | 3.000 | 1.000 |  |
| Error | .000 | 1.000 |  |

|  |
| --- |
| 1. For each source, the expected mean square equals the sum of the coefficients in the cells times the variance components, plus a quadratic term involving effects in the Quadratic Term cell. |
| 2. Expected Mean Squares are based on the Type III Sums of Squares. |

Custom Hypothesis Tests

|  |  |  |  |
| --- | --- | --- | --- |
| **Contrast Results (K Matrix)** | | | |
| treatment Simple Contrast1 | | | **Dependent Variable** |
| **lnpk** |
| Level 2 vs. Level 1 | Contrast Estimate | | .022 |
| Hypothesized Value | | 0 |
| Difference (Estimate - Hypothesized) | | .022 |
| Std. Error | | .030 |
| Sig. | | .452 |
| 95% Confidence Interval for Difference | Lower Bound | -.037 |
| Upper Bound | .082 |

|  |
| --- |
| 1. Reference category = 1 |

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| **Test Results** | | | | | |
| Dependent Variable: lnpk | | | | | |
| Source | **Sum of Squares** | **df** | **Mean Square** | **F** | **Sig.** |
| Contrast | .008 | 1 | .008 | .575 | .452 |
| Error | .628 | 45 | .014 |  |  |

MIXED lnpk BY period sequence treatment subject

/CRITERIA=DFMETHOD(SATTERTHWAITE) CIN(95) MXITER(100) MXSTEP(10) SCORING(1)

SINGULAR(0.000000000001) HCONVERGE(0, ABSOLUTE) LCONVERGE(0, ABSOLUTE) PCONVERGE(0.000001, ABSOLUTE)

/FIXED=period sequence treatment | SSTYPE(3)

/METHOD=REML

/RANDOM= subject(sequence) | COVTYPE(ID)

/EMMEANS=TABLES(treatment) COMPARE REFCAT(FIRST) ADJ(LSD).

Mixed Model Analysis

|  |  |  |
| --- | --- | --- |
| **Notes** | | |
| Output Created | | 28-FEB-2021 17:54:29 |
| Comments | |  |
| Input | Active Dataset | pkdataset |
| Filter | <none> |
| Weight | <none> |
| Split File | <none> |
| N of Rows in Working Data File | 72 |
| Missing Value Handling | Definition of Missing | User-defined missing values are treated as missing. |
| Cases Used | Statistics are based on all cases with valid data for all variables in the model. |
| Syntax | | MIXED lnpk BY period sequence treatment subject  /CRITERIA=DFMETHOD(SATTERTHWAITE) CIN(95) MXITER(100) MXSTEP(10) SCORING(1)  SINGULAR(0.000000000001) HCONVERGE(0, ABSOLUTE) LCONVERGE(0, ABSOLUTE) PCONVERGE(0.000001, ABSOLUTE)  /FIXED=period sequence treatment | SSTYPE(3)  /METHOD=REML  /RANDOM= subject(sequence) | COVTYPE(ID)  /EMMEANS=TABLES(treatment) COMPARE REFCAT(FIRST) ADJ(LSD). |
| Resources | Processor Time | 00:00:00.05 |
| Elapsed Time | 00:00:00.04 |

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| **Model Dimension1** | | | | |
|  | | **Number of Levels** | **Covariance Structure** | **Number of Parameters** |
| Fixed Effects | Intercept | 1 |  | 1 |
| period | 3 |  | 2 |
| sequence | 3 |  | 2 |
| treatment | 2 |  | 1 |
| Random Effects | subject(sequence) | 24 | Identity | 1 |
| Residual | |  |  | 1 |
| Total | | 33 |  | 8 |

|  |
| --- |
| 1. Dependent Variable: lnpk. |

|  |  |
| --- | --- |
| **Information Criteria1** | |
| -2 Restricted Log Likelihood | -28.58817102 |
| Akaike's Information Criterion (AIC) | -24.58817102 |
| Hurvich and Tsai's Criterion (AICC) | -24.39769483 |
| Bozdogan's Criterion (CAIC) | -18.20886154 |
| Schwarz's Bayesian Criterion (BIC) | -20.20886154 |

|  |
| --- |
| The information criteria are displayed in smaller-is-better form.1 |
| 1. Dependent Variable: lnpk. |

Fixed Effects

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| **Type III Tests of Fixed Effects1** | | | | |
| Source | **Numerator df** | **Denominator df** | **F** | **Sig.** |
| Intercept | 1 | 21.524 | 32145.948 | .000 |
| period | 2 | 45.000 | 1.420 | .252 |
| sequence | 2 | 21 | .085 | .919 |
| treatment | 1 | 45.000 | .575 | .452 |

|  |
| --- |
| 1. Dependent Variable: lnpk. |

Covariance Parameters

|  |  |  |  |
| --- | --- | --- | --- |
| **Estimates of Covariance Parameters1** | | | |
| Parameter | | **Estimate** | **Std. Error** |
| Residual | | .013958 | .002943 |
| subject(sequence) | Variance | .042156 | .014479 |

|  |
| --- |
| 1. Dependent Variable: lnpk. |

Estimated Marginal Means

treatment

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| **Estimates1** | | | | | |
| treatment | **Mean** | **Std. Error** | **df** | **95% Confidence Interval** | |
| **Lower Bound** | **Upper Bound** |
| R | 7.956 | .045 | 23.113 | 7.862 | 8.050 |
| T | 7.978 | .048 | 29.632 | 7.880 | 8.077 |

|  |
| --- |
| 1. Dependent Variable: lnpk. |

|  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- |
| **Pairwise Comparisons1** | | | | | | |
| (I) treatment | (J) treatment | **Mean Difference (I-J)** | **Std. Error** | **df** | **Sig.2** | **95% Confidence Interval for Difference2** |
| **Lower Bound** |
| T | R | .02239143 | .02953558 | 45.00000000 | .45233306 | -.03709627 |

|  |  |  |
| --- | --- | --- |
| **Pairwise Comparisons1** | | |
| (I) treatment | (J) treatment | 95% Confidence Interval for Difference |
| **Upper Bound** |
| T | R | .08187913 |

|  |
| --- |
| Based on estimated marginal means1 |
| 1. Dependent Variable: lnpk. |
| 2. Adjustment for multiple comparisons: Least Significant Difference (equivalent to no adjustments). |

|  |  |  |  |
| --- | --- | --- | --- |
| **Univariate Tests1** | | | |
| **Numerator df** | **Denominator df** | **F** | **Sig.** |
| 1 | 45.000 | .575 | .452 |

|  |
| --- |
| The F tests the effect of treatment. This test is based on the linearly independent pairwise comparisons among the estimated marginal means.1 |
| 1. Dependent Variable: lnpk. |

MIXED lnpk BY period treatment sequence subject

/CRITERIA=CIN(90) MXITER(200) MXSTEP(20) SCORING(2) SINGULAR(0.000000000001) HCONVERGE(0,

RELATIVE) LCONVERGE(0.0000000000001, RELATIVE) PCONVERGE(0, RELATIVE)

/FIXED=period treatment sequence | SSTYPE(3)

/METHOD=REML

/RANDOM=treatment | SUBJECT(subject) COVTYPE(CSH)

/REPEATED=treatment | SUBJECT(subject\*period) COVTYPE(DIAG)

/EMMEANS=TABLES(treatment) COMPARE REFCAT(FIRST) ADJ(LSD).

Mixed Model Analysis

|  |  |  |
| --- | --- | --- |
| **Notes** | | |
| Output Created | | 28-FEB-2021 17:54:29 |
| Comments | |  |
| Input | Active Dataset | pkdataset |
| Filter | <none> |
| Weight | <none> |
| Split File | <none> |
| N of Rows in Working Data File | 72 |
| Missing Value Handling | Definition of Missing | User-defined missing values are treated as missing. |
| Cases Used | Statistics are based on all cases with valid data for all variables in the model. |
| Syntax | | MIXED lnpk BY period treatment sequence subject  /CRITERIA=CIN(90) MXITER(200) MXSTEP(20) SCORING(2) SINGULAR(0.000000000001) HCONVERGE(0,  RELATIVE) LCONVERGE(0.0000000000001, RELATIVE) PCONVERGE(0, RELATIVE)  /FIXED=period treatment sequence | SSTYPE(3)  /METHOD=REML  /RANDOM=treatment | SUBJECT(subject) COVTYPE(CSH)  /REPEATED=treatment | SUBJECT(subject\*period) COVTYPE(DIAG)  /EMMEANS=TABLES(treatment) COMPARE REFCAT(FIRST) ADJ(LSD). |
| Resources | Processor Time | 00:00:00.05 |
| Elapsed Time | 00:00:00.07 |

|  |
| --- |
| **Warnings** |
| Iteration was terminated but convergence has not been achieved. The MIXED procedure continues despite this warning. Subsequent results produced are based on the last iteration. Validity of the model fit is uncertain. |

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| **Model Dimension1** | | | | | |
|  | | **Number of Levels** | **Covariance Structure** | **Number of Parameters** | **Subject Variables** |
| Fixed Effects | Intercept | 1 |  | 1 |  |
| period | 3 |  | 2 |  |
| treatment | 2 |  | 1 |  |
| sequence | 3 |  | 2 |  |
| Random Effects | treatment | 2 | Heterogeneous Compound Symmetry | 3 | subject |
| Repeated Effects | treatment | 2 | Diagonal | 2 | subject \* period |
| Total | | 13 |  | 11 |  |

|  |  |  |
| --- | --- | --- |
| **Model Dimension1** | | |
|  | | **Number of Subjects** |
| Fixed Effects | Intercept |  |
| period |  |
| treatment |  |
| sequence |  |
| Random Effects | treatment |  |
| Repeated Effects | treatment | 72 |
| Total | |  |

|  |
| --- |
| 1. Dependent Variable: lnpk. |

|  |  |
| --- | --- |
| **Information Criteria1** | |
| -2 Restricted Log Likelihood | -30.67456491 |
| Akaike's Information Criterion (AIC) | -20.67456491 |
| Hurvich and Tsai's Criterion (AICC) | -19.67456491 |
| Bozdogan's Criterion (CAIC) | -4.72629120 |
| Schwarz's Bayesian Criterion (BIC) | -9.72629120 |

|  |
| --- |
| The information criteria are displayed in smaller-is-better form.1 |
| 1. Dependent Variable: lnpk. |

Fixed Effects

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| **Type III Tests of Fixed Effects1** | | | | |
| Source | **Numerator df** | **Denominator df** | **F** | **Sig.** |
| Intercept | 1 | 20.505 | 29782.235 | .000 |
| period | 2 | 44.944 | 1.294 | .284 |
| treatment | 1 | 19.892 | .546 | .469 |
| sequence | 2 | 22.042 | .167 | .847 |

|  |
| --- |
| 1. Dependent Variable: lnpk. |

Covariance Parameters

|  |  |  |  |
| --- | --- | --- | --- |
| **Estimates of Covariance Parameters1** | | | |
| Parameter | | **Estimate** | **Std. Error** |
| Repeated Measures | Var: [treatment=R] | .013 | .004 |
| Var: [treatment=T] | 4.285E-8 | 6.536E-5 |
| treatment [subject = subject] | Var: [treatment=R] | .036 | .013 |
| Var: [treatment=T] | .070 | .022 |
| CSH rho | .903 | .071 |

|  |
| --- |
| 1. Dependent Variable: lnpk. |

Estimated Marginal Means

treatment

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| **Estimates1** | | | | | |
| treatment | **Mean** | **Std. Error** | **df** | **90% Confidence Interval** | |
| **Lower Bound** | **Upper Bound** |
| R | 7.956 | .042 | 20.973 | 7.883 | 8.029 |
| T | 7.978 | .054 | 20.054 | 7.885 | 8.072 |

|  |
| --- |
| 1. Dependent Variable: lnpk. |

|  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- |
| **Pairwise Comparisons1** | | | | | | |
| (I) treatment | (J) treatment | **Mean Difference (I-J)** | **Std. Error** | **df** | **Sig.2** | **90% Confidence Interval for Difference2** |
| **Lower Bound** |
| T | R | .02239143 | .03031665 | 19.89169732 | .46878461 | -.02991006 |

|  |  |  |
| --- | --- | --- |
| **Pairwise Comparisons1** | | |
| (I) treatment | (J) treatment | 90% Confidence Interval for Difference |
| **Upper Bound** |
| T | R | .07469292 |

|  |
| --- |
| Based on estimated marginal means1 |
| 1. Dependent Variable: lnpk. |
| 2. Adjustment for multiple comparisons: Least Significant Difference (equivalent to no adjustments). |

|  |  |  |  |
| --- | --- | --- | --- |
| **Univariate Tests1** | | | |
| **Numerator df** | **Denominator df** | **F** | **Sig.** |
| 1 | 19.892 | .546 | .469 |

|  |
| --- |
| The F tests the effect of treatment. This test is based on the linearly independent pairwise comparisons among the estimated marginal means.1 |
| 1. Dependent Variable: lnpk. |

DATASET CLOSE pkdataset.

TITLE "RDS03".

RDS03

GET DATA

/TYPE=XLSX

/FILE='.\rds01.xlsx'

/SHEET=name 'rds03'

/CELLRANGE=FULL

/READNAMES=ON

/LEADINGSPACES IGNORE=YES

/TRAILINGSPACES IGNORE=YES

/DATATYPEMIN PERCENTAGE=95.0

/HIDDEN IGNORE=YES.

EXECUTE.

DATASET NAME pkdataset WINDOW=FRONT.

COMPUTE lnpk=ln(PK).

EXECUTE.

UNIANOVA lnpk BY period sequence treatment subject

/RANDOM subject

/CONTRAST(treatment)=Simple(1)

/METHOD=SSTYPE(3)

/INTERCEPT=INCLUDE

/CRITERIA=ALPHA(0.05)

/DESIGN=period sequence treatment subject(sequence).

Univariate Analysis of Variance

|  |  |  |
| --- | --- | --- |
| **Notes** | | |
| Output Created | | 28-FEB-2021 17:54:30 |
| Comments | |  |
| Input | Active Dataset | pkdataset |
| Filter | <none> |
| Weight | <none> |
| Split File | <none> |
| N of Rows in Working Data File | 223 |
| Missing Value Handling | Definition of Missing | User-defined missing values are treated as missing. |
| Cases Used | Statistics are based on all cases with valid data for all variables in the model. |
| Syntax | | UNIANOVA lnpk BY period sequence treatment subject  /RANDOM subject  /CONTRAST(treatment)=Simple(1)  /METHOD=SSTYPE(3)  /INTERCEPT=INCLUDE  /CRITERIA=ALPHA(0.05)  /DESIGN=period sequence treatment subject(sequence). |
| Resources | Processor Time | 00:00:00.09 |
| Elapsed Time | 00:00:00.05 |

|  |  |  |
| --- | --- | --- |
| **Between-Subjects Factors** | | |
|  | | **N** |
| period | 1 | 77 |
| 2 | 76 |
| 3 | 70 |
| sequence | RTR | 112 |
| TRT | 111 |
| treatment | R | 112 |
| T | 111 |
| subject | 1 | 3 |
| 2 | 3 |
| 3 | 3 |
| 4 | 3 |
| 5 | 3 |
| 6 | 3 |
| 7 | 3 |
| 8 | 3 |
| 9 | 3 |
| 10 | 3 |
| 11 | 2 |
| 12 | 3 |
| 13 | 3 |
| 14 | 3 |
| 15 | 3 |
| 16 | 3 |
| 17 | 3 |
| 18 | 3 |
| 19 | 3 |
| 20 | 2 |
| 21 | 3 |
| 22 | 3 |
| 23 | 3 |
| 24 | 2 |
| 25 | 3 |
| 26 | 3 |
| 27 | 3 |
| 28 | 3 |
| 29 | 3 |
| 30 | 3 |
| 31 | 2 |
| 32 | 3 |
| 33 | 3 |
| 34 | 3 |
| 35 | 3 |
| 36 | 3 |
| 37 | 3 |
| 38 | 3 |
| 39 | 3 |
| 40 | 3 |
| 41 | 3 |
| 42 | 2 |
| 43 | 3 |
| 44 | 3 |
| 45 | 3 |
| 46 | 3 |
| 47 | 3 |
| 48 | 3 |
| 49 | 3 |
| 50 | 3 |
| 51 | 3 |
| 52 | 3 |
| 53 | 3 |
| 54 | 3 |
| 55 | 3 |
| 56 | 3 |
| 57 | 3 |
| 58 | 3 |
| 59 | 3 |
| 60 | 3 |
| 62 | 3 |
| 63 | 3 |
| 64 | 3 |
| 65 | 3 |
| 66 | 3 |
| 67 | 2 |
| 68 | 3 |
| 69 | 2 |
| 70 | 3 |
| 71 | 2 |
| 72 | 3 |
| 73 | 3 |
| 74 | 3 |
| 75 | 3 |
| 76 | 3 |
| 77 | 3 |
| 78 | 3 |

|  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- |
| **Tests of Between-Subjects Effects** | | | | | | |
| Dependent Variable: lnpk | | | | | | |
| Source | | **Type III Sum of Squares** | **df** | **Mean Square** | **F** | **Sig.** |
| Intercept | Hypothesis | 13054.259 | 1 | 13054.259 | 5994.993 | .000 |
| Error | 163.738 | 75.194 | 2.1781 |  |  |
| period | Hypothesis | .027 | 2 | .014 | .086 | .918 |
| Error | 22.798 | 143 | .1592 |  |  |
| sequence | Hypothesis | .429 | 1 | .429 | .216 | .644 |
| Error | 151.727 | 76.340 | 1.9883 |  |  |
| treatment | Hypothesis | 2.322 | 1 | 2.322 | 14.564 | .000 |
| Error | 22.798 | 143 | .1592 |  |  |
| subject(sequence) | Hypothesis | 166.038 | 75 | 2.214 | 13.886 | .000 |
| Error | 22.798 | 143 | .1592 |  |  |

|  |
| --- |
| 1. .982 MS(subject(sequence)) + .018 MS(Error) |
| 2. MS(Error) |
| 3. .890 MS(subject(sequence)) + .110 MS(Error) |

|  |  |  |  |
| --- | --- | --- | --- |
| **Expected Mean Squares1,2** | | | |
| Source | **Variance Component** | | |
| **Var(subject(sequence))** | **Var(Error)** | **Quadratic Term** |
| Intercept | 2.843 | 1.000 | Intercept, period, sequence, treatment |
| period | .000 | 1.000 | period |
| sequence | 2.575 | 1.000 | sequence |
| treatment | .000 | 1.000 | treatment |
| subject(sequence) | 2.894 | 1.000 |  |
| Error | .000 | 1.000 |  |

|  |
| --- |
| 1. For each source, the expected mean square equals the sum of the coefficients in the cells times the variance components, plus a quadratic term involving effects in the Quadratic Term cell. |
| 2. Expected Mean Squares are based on the Type III Sums of Squares. |

Custom Hypothesis Tests

|  |  |  |  |
| --- | --- | --- | --- |
| **Contrast Results (K Matrix)** | | | |
| treatment Simple Contrast1 | | | **Dependent Variable** |
| **lnpk** |
| Level 2 vs. Level 1 | Contrast Estimate | | .217 |
| Hypothesized Value | | 0 |
| Difference (Estimate - Hypothesized) | | .217 |
| Std. Error | | .057 |
| Sig. | | .000 |
| 95% Confidence Interval for Difference | Lower Bound | .104 |
| Upper Bound | .329 |

|  |
| --- |
| 1. Reference category = 1 |

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| **Test Results** | | | | | |
| Dependent Variable: lnpk | | | | | |
| Source | **Sum of Squares** | **df** | **Mean Square** | **F** | **Sig.** |
| Contrast | 2.322 | 1 | 2.322 | 14.564 | .000 |
| Error | 22.798 | 143 | .159 |  |  |

MIXED lnpk BY period sequence treatment subject

/CRITERIA=DFMETHOD(SATTERTHWAITE) CIN(95) MXITER(100) MXSTEP(10) SCORING(1)

SINGULAR(0.000000000001) HCONVERGE(0, ABSOLUTE) LCONVERGE(0, ABSOLUTE) PCONVERGE(0.000001, ABSOLUTE)

/FIXED=period sequence treatment | SSTYPE(3)

/METHOD=REML

/RANDOM= subject(sequence) | COVTYPE(ID)

/EMMEANS=TABLES(treatment) COMPARE REFCAT(FIRST) ADJ(LSD).

Mixed Model Analysis

|  |  |  |
| --- | --- | --- |
| **Notes** | | |
| Output Created | | 28-FEB-2021 17:54:30 |
| Comments | |  |
| Input | Active Dataset | pkdataset |
| Filter | <none> |
| Weight | <none> |
| Split File | <none> |
| N of Rows in Working Data File | 223 |
| Missing Value Handling | Definition of Missing | User-defined missing values are treated as missing. |
| Cases Used | Statistics are based on all cases with valid data for all variables in the model. |
| Syntax | | MIXED lnpk BY period sequence treatment subject  /CRITERIA=DFMETHOD(SATTERTHWAITE) CIN(95) MXITER(100) MXSTEP(10) SCORING(1)  SINGULAR(0.000000000001) HCONVERGE(0, ABSOLUTE) LCONVERGE(0, ABSOLUTE) PCONVERGE(0.000001, ABSOLUTE)  /FIXED=period sequence treatment | SSTYPE(3)  /METHOD=REML  /RANDOM= subject(sequence) | COVTYPE(ID)  /EMMEANS=TABLES(treatment) COMPARE REFCAT(FIRST) ADJ(LSD). |
| Resources | Processor Time | 00:00:00.28 |
| Elapsed Time | 00:00:00.54 |

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| **Model Dimension1** | | | | |
|  | | **Number of Levels** | **Covariance Structure** | **Number of Parameters** |
| Fixed Effects | Intercept | 1 |  | 1 |
| period | 3 |  | 2 |
| sequence | 2 |  | 1 |
| treatment | 2 |  | 1 |
| Random Effects | subject(sequence) | 77 | Identity | 1 |
| Residual | |  |  | 1 |
| Total | | 85 |  | 7 |

|  |
| --- |
| 1. Dependent Variable: lnpk. |

|  |  |
| --- | --- |
| **Information Criteria1** | |
| -2 Restricted Log Likelihood | 436.51167656 |
| Akaike's Information Criterion (AIC) | 440.51167656 |
| Hurvich and Tsai's Criterion (AICC) | 440.56749051 |
| Bozdogan's Criterion (CAIC) | 449.28066668 |
| Schwarz's Bayesian Criterion (BIC) | 447.28066668 |

|  |
| --- |
| The information criteria are displayed in smaller-is-better form.1 |
| 1. Dependent Variable: lnpk. |

Fixed Effects

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| **Type III Tests of Fixed Effects1** | | | | |
| Source | **Numerator df** | **Denominator df** | **F** | **Sig.** |
| Intercept | 1 | 74.928 | 5967.240 | .000 |
| period | 2 | 143.415 | .073 | .929 |
| sequence | 1 | 76.077 | .215 | .644 |
| treatment | 1 | 143.267 | 14.888 | .000 |

|  |
| --- |
| 1. Dependent Variable: lnpk. |

Covariance Parameters

|  |  |  |  |
| --- | --- | --- | --- |
| **Estimates of Covariance Parameters1** | | | |
| Parameter | | **Estimate** | **Std. Error** |
| Residual | | .159476 | .018865 |
| subject(sequence) | Variance | .713582 | .125897 |

|  |
| --- |
| 1. Dependent Variable: lnpk. |

Estimated Marginal Means

treatment

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| **Estimates1** | | | | | |
| treatment | **Mean** | **Std. Error** | **df** | **95% Confidence Interval** | |
| **Lower Bound** | **Upper Bound** |
| R | 7.614 | .104 | 87.051 | 7.407 | 7.820 |
| T | 7.833 | .104 | 87.294 | 7.626 | 8.039 |

|  |
| --- |
| 1. Dependent Variable: lnpk. |

|  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- |
| **Pairwise Comparisons1** | | | | | | |
| (I) treatment | (J) treatment | **Mean Difference (I-J)** | **Std. Error** | **df** | **Sig.3** | **95% Confidence Interval for Difference3** |
| **Lower Bound** |
| T | R | .21892221\* | .05673754 | 143.26681095 | .00017194 | .10677134 |

|  |  |  |
| --- | --- | --- |
| **Pairwise Comparisons1** | | |
| (I) treatment | (J) treatment | 95% Confidence Interval for Difference |
| **Upper Bound** |
| T | R | .33107308 |

|  |
| --- |
| Based on estimated marginal means1 |
| \*. The mean difference is significant at the .05 level. |
| 1. Dependent Variable: lnpk. |
| 3. Adjustment for multiple comparisons: Least Significant Difference (equivalent to no adjustments). |

|  |  |  |  |
| --- | --- | --- | --- |
| **Univariate Tests1** | | | |
| **Numerator df** | **Denominator df** | **F** | **Sig.** |
| 1 | 143.267 | 14.888 | .000 |

|  |
| --- |
| The F tests the effect of treatment. This test is based on the linearly independent pairwise comparisons among the estimated marginal means.1 |
| 1. Dependent Variable: lnpk. |

MIXED lnpk BY period treatment sequence subject

/CRITERIA=CIN(90) MXITER(200) MXSTEP(20) SCORING(2) SINGULAR(0.000000000001) HCONVERGE(0,

RELATIVE) LCONVERGE(0.0000000000001, RELATIVE) PCONVERGE(0, RELATIVE)

/FIXED=period treatment sequence | SSTYPE(3)

/METHOD=REML

/RANDOM=treatment | SUBJECT(subject) COVTYPE(CSH)

/REPEATED=treatment | SUBJECT(subject\*period) COVTYPE(DIAG)

/EMMEANS=TABLES(treatment) COMPARE REFCAT(FIRST) ADJ(LSD).

Mixed Model Analysis

|  |  |  |
| --- | --- | --- |
| **Notes** | | |
| Output Created | | 28-FEB-2021 17:54:31 |
| Comments | |  |
| Input | Active Dataset | pkdataset |
| Filter | <none> |
| Weight | <none> |
| Split File | <none> |
| N of Rows in Working Data File | 223 |
| Missing Value Handling | Definition of Missing | User-defined missing values are treated as missing. |
| Cases Used | Statistics are based on all cases with valid data for all variables in the model. |
| Syntax | | MIXED lnpk BY period treatment sequence subject  /CRITERIA=CIN(90) MXITER(200) MXSTEP(20) SCORING(2) SINGULAR(0.000000000001) HCONVERGE(0,  RELATIVE) LCONVERGE(0.0000000000001, RELATIVE) PCONVERGE(0, RELATIVE)  /FIXED=period treatment sequence | SSTYPE(3)  /METHOD=REML  /RANDOM=treatment | SUBJECT(subject) COVTYPE(CSH)  /REPEATED=treatment | SUBJECT(subject\*period) COVTYPE(DIAG)  /EMMEANS=TABLES(treatment) COMPARE REFCAT(FIRST) ADJ(LSD). |
| Resources | Processor Time | 00:00:00.08 |
| Elapsed Time | 00:00:00.28 |

|  |
| --- |
| **Warnings** |
| The final Hessian matrix is not positive definite although all convergence criteria are satisfied. The MIXED procedure continues despite this warning. Validity of subsequent results cannot be ascertained. |

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| **Model Dimension1** | | | | | |
|  | | **Number of Levels** | **Covariance Structure** | **Number of Parameters** | **Subject Variables** |
| Fixed Effects | Intercept | 1 |  | 1 |  |
| period | 3 |  | 2 |  |
| treatment | 2 |  | 1 |  |
| sequence | 2 |  | 1 |  |
| Random Effects | treatment | 2 | Heterogeneous Compound Symmetry | 3 | subject |
| Repeated Effects | treatment | 2 | Diagonal | 2 | subject \* period |
| Total | | 12 |  | 10 |  |

|  |  |  |
| --- | --- | --- |
| **Model Dimension1** | | |
|  | | **Number of Subjects** |
| Fixed Effects | Intercept |  |
| period |  |
| treatment |  |
| sequence |  |
| Random Effects | treatment |  |
| Repeated Effects | treatment | 223 |
| Total | |  |

|  |
| --- |
| 1. Dependent Variable: lnpk. |

|  |  |
| --- | --- |
| **Information Criteria1** | |
| -2 Restricted Log Likelihood | 425.44656047 |
| Akaike's Information Criterion (AIC) | 435.44656047 |
| Hurvich and Tsai's Criterion (AICC) | 435.72957934 |
| Bozdogan's Criterion (CAIC) | 457.36903578 |
| Schwarz's Bayesian Criterion (BIC) | 452.36903578 |

|  |
| --- |
| The information criteria are displayed in smaller-is-better form.1 |
| 1. Dependent Variable: lnpk. |

Fixed Effects

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| **Type III Tests of Fixed Effects1** | | | | |
| Source | **Numerator df** | **Denominator df** | **F** | **Sig.** |
| Intercept | 1 | 58.515 | 5928.941 | .000 |
| period | 2 | 135.615 | .092 | .912 |
| treatment | 1 | 136.743 | 14.767 | .000 |
| sequence | 1 | 59.429 | .209 | .649 |

|  |
| --- |
| 1. Dependent Variable: lnpk. |

Covariance Parameters

|  |  |  |  |
| --- | --- | --- | --- |
| **Estimates of Covariance Parameters1** | | | |
| Parameter | | **Estimate** | **Std. Error** |
| Repeated Measures | Var: [treatment=R] | .218 | .039 |
| Var: [treatment=T] | .095 | .021 |
| treatment [subject = subject] | Var: [treatment=R] | .777 | .155 |
| Var: [treatment=T] | .665 | .120 |
| CSH rho | 1.0002 | .000 |

|  |
| --- |
| 1. Dependent Variable: lnpk. |
| 2. This covariance parameter is redundant. |

Estimated Marginal Means

treatment

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| **Estimates1** | | | | | |
| treatment | **Mean** | **Std. Error** | **df** | **90% Confidence Interval** | |
| **Lower Bound** | **Upper Bound** |
| R | 7.615 | .110 | 73.592 | 7.432 | 7.799 |
| T | 7.832 | .098 | 60.234 | 7.669 | 7.996 |

|  |
| --- |
| 1. Dependent Variable: lnpk. |

|  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- |
| **Pairwise Comparisons1** | | | | | | |
| (I) treatment | (J) treatment | **Mean Difference (I-J)** | **Std. Error** | **df** | **Sig.3** | **90% Confidence Interval for Difference3** |
| **Lower Bound** |
| T | R | .21739364\* | .05657109 | 136.74265394 | .00018551 | .12370778 |

|  |  |  |
| --- | --- | --- |
| **Pairwise Comparisons1** | | |
| (I) treatment | (J) treatment | 90% Confidence Interval for Difference |
| **Upper Bound** |
| T | R | .31107951 |

|  |
| --- |
| Based on estimated marginal means1 |
| \*. The mean difference is significant at the .10 level. |
| 1. Dependent Variable: lnpk. |
| 3. Adjustment for multiple comparisons: Least Significant Difference (equivalent to no adjustments). |

|  |  |  |  |
| --- | --- | --- | --- |
| **Univariate Tests1** | | | |
| **Numerator df** | **Denominator df** | **F** | **Sig.** |
| 1 | 136.743 | 14.767 | .000 |

|  |
| --- |
| The F tests the effect of treatment. This test is based on the linearly independent pairwise comparisons among the estimated marginal means.1 |
| 1. Dependent Variable: lnpk. |

DATASET CLOSE pkdataset.

TITLE "RDS04".

RDS04

GET DATA

/TYPE=XLSX

/FILE='.\rds01.xlsx'

/SHEET=name 'rds04'

/CELLRANGE=FULL

/READNAMES=ON

/LEADINGSPACES IGNORE=YES

/TRAILINGSPACES IGNORE=YES

/DATATYPEMIN PERCENTAGE=95.0

/HIDDEN IGNORE=YES.

EXECUTE.

DATASET NAME pkdataset WINDOW=FRONT.

COMPUTE lnpk=ln(PK).

EXECUTE.

UNIANOVA lnpk BY period sequence treatment subject

/RANDOM subject

/CONTRAST(treatment)=Simple(1)

/METHOD=SSTYPE(3)

/INTERCEPT=INCLUDE

/CRITERIA=ALPHA(0.05)

/DESIGN=period sequence treatment subject(sequence).

Univariate Analysis of Variance

|  |  |  |
| --- | --- | --- |
| **Notes** | | |
| Output Created | | 28-FEB-2021 17:54:32 |
| Comments | |  |
| Input | Active Dataset | pkdataset |
| Filter | <none> |
| Weight | <none> |
| Split File | <none> |
| N of Rows in Working Data File | 153 |
| Missing Value Handling | Definition of Missing | User-defined missing values are treated as missing. |
| Cases Used | Statistics are based on all cases with valid data for all variables in the model. |
| Syntax | | UNIANOVA lnpk BY period sequence treatment subject  /RANDOM subject  /CONTRAST(treatment)=Simple(1)  /METHOD=SSTYPE(3)  /INTERCEPT=INCLUDE  /CRITERIA=ALPHA(0.05)  /DESIGN=period sequence treatment subject(sequence). |
| Resources | Processor Time | 00:00:00.02 |
| Elapsed Time | 00:00:00.02 |

|  |  |  |
| --- | --- | --- |
| **Between-Subjects Factors** | | |
|  | | **N** |
| period | 1 | 51 |
| 2 | 51 |
| 3 | 51 |
| sequence | RRT | 51 |
| RTR | 51 |
| TRR | 51 |
| treatment | R | 102 |
| T | 51 |
| subject | 1 | 3 |
| 2 | 3 |
| 4 | 3 |
| 5 | 3 |
| 6 | 3 |
| 7 | 3 |
| 8 | 3 |
| 9 | 3 |
| 10 | 3 |
| 11 | 3 |
| 12 | 3 |
| 13 | 3 |
| 15 | 3 |
| 16 | 3 |
| 17 | 3 |
| 18 | 3 |
| 19 | 3 |
| 20 | 3 |
| 22 | 3 |
| 23 | 3 |
| 24 | 3 |
| 25 | 3 |
| 26 | 3 |
| 28 | 3 |
| 29 | 3 |
| 30 | 3 |
| 31 | 3 |
| 32 | 3 |
| 33 | 3 |
| 34 | 3 |
| 35 | 3 |
| 36 | 3 |
| 37 | 3 |
| 38 | 3 |
| 39 | 3 |
| 40 | 3 |
| 42 | 3 |
| 43 | 3 |
| 44 | 3 |
| 45 | 3 |
| 46 | 3 |
| 47 | 3 |
| 48 | 3 |
| 49 | 3 |
| 50 | 3 |
| 52 | 3 |
| 53 | 3 |
| 54 | 3 |
| 55 | 3 |
| 56 | 3 |
| 57 | 3 |

|  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- |
| **Tests of Between-Subjects Effects** | | | | | | |
| Dependent Variable: lnpk | | | | | | |
| Source | | **Type III Sum of Squares** | **df** | **Mean Square** | **F** | **Sig.** |
| Intercept | Hypothesis | 2053.561 | 1 | 2053.561 | 2164.993 | .000 |
| Error | 48.686 | 51.328 | .9491 |  |  |
| period | Hypothesis | .066 | 2 | .033 | .116 | .891 |
| Error | 28.093 | 99 | .2842 |  |  |
| sequence | Hypothesis | 4.262 | 2 | 2.131 | 2.066 | .138 |
| Error | 49.518 | 48 | 1.0323 |  |  |
| treatment | Hypothesis | 3.403 | 1 | 3.403 | 11.992 | .001 |
| Error | 28.093 | 99 | .2842 |  |  |
| subject(sequence) | Hypothesis | 49.518 | 48 | 1.032 | 3.635 | .000 |
| Error | 28.093 | 99 | .2842 |  |  |

|  |
| --- |
| 1. .889 MS(subject(sequence)) + .111 MS(Error) |
| 2. MS(Error) |
| 3. MS(subject(sequence)) |

|  |  |  |  |
| --- | --- | --- | --- |
| **Expected Mean Squares1,2** | | | |
| Source | **Variance Component** | | |
| **Var(subject(sequence))** | **Var(Error)** | **Quadratic Term** |
| Intercept | 2.667 | 1.000 | Intercept, period, sequence, treatment |
| period | .000 | 1.000 | period |
| sequence | 3.000 | 1.000 | sequence |
| treatment | .000 | 1.000 | treatment |
| subject(sequence) | 3.000 | 1.000 |  |
| Error | .000 | 1.000 |  |

|  |
| --- |
| 1. For each source, the expected mean square equals the sum of the coefficients in the cells times the variance components, plus a quadratic term involving effects in the Quadratic Term cell. |
| 2. Expected Mean Squares are based on the Type III Sums of Squares. |

Custom Hypothesis Tests

|  |  |  |  |
| --- | --- | --- | --- |
| **Contrast Results (K Matrix)** | | | |
| treatment Simple Contrast1 | | | **Dependent Variable** |
| **lnpk** |
| Level 2 vs. Level 1 | Contrast Estimate | | .316 |
| Hypothesized Value | | 0 |
| Difference (Estimate - Hypothesized) | | .316 |
| Std. Error | | .091 |
| Sig. | | .001 |
| 95% Confidence Interval for Difference | Lower Bound | .135 |
| Upper Bound | .498 |

|  |
| --- |
| 1. Reference category = 1 |

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| **Test Results** | | | | | |
| Dependent Variable: lnpk | | | | | |
| Source | **Sum of Squares** | **df** | **Mean Square** | **F** | **Sig.** |
| Contrast | 3.403 | 1 | 3.403 | 11.992 | .001 |
| Error | 28.093 | 99 | .284 |  |  |

MIXED lnpk BY period sequence treatment subject

/CRITERIA=DFMETHOD(SATTERTHWAITE) CIN(95) MXITER(100) MXSTEP(10) SCORING(1)

SINGULAR(0.000000000001) HCONVERGE(0, ABSOLUTE) LCONVERGE(0, ABSOLUTE) PCONVERGE(0.000001, ABSOLUTE)

/FIXED=period sequence treatment | SSTYPE(3)

/METHOD=REML

/RANDOM= subject(sequence) | COVTYPE(ID)

/EMMEANS=TABLES(treatment) COMPARE REFCAT(FIRST) ADJ(LSD).

Mixed Model Analysis

|  |  |  |
| --- | --- | --- |
| **Notes** | | |
| Output Created | | 28-FEB-2021 17:54:32 |
| Comments | |  |
| Input | Active Dataset | pkdataset |
| Filter | <none> |
| Weight | <none> |
| Split File | <none> |
| N of Rows in Working Data File | 153 |
| Missing Value Handling | Definition of Missing | User-defined missing values are treated as missing. |
| Cases Used | Statistics are based on all cases with valid data for all variables in the model. |
| Syntax | | MIXED lnpk BY period sequence treatment subject  /CRITERIA=DFMETHOD(SATTERTHWAITE) CIN(95) MXITER(100) MXSTEP(10) SCORING(1)  SINGULAR(0.000000000001) HCONVERGE(0, ABSOLUTE) LCONVERGE(0, ABSOLUTE) PCONVERGE(0.000001, ABSOLUTE)  /FIXED=period sequence treatment | SSTYPE(3)  /METHOD=REML  /RANDOM= subject(sequence) | COVTYPE(ID)  /EMMEANS=TABLES(treatment) COMPARE REFCAT(FIRST) ADJ(LSD). |
| Resources | Processor Time | 00:00:00.03 |
| Elapsed Time | 00:00:00.04 |

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| **Model Dimension1** | | | | |
|  | | **Number of Levels** | **Covariance Structure** | **Number of Parameters** |
| Fixed Effects | Intercept | 1 |  | 1 |
| period | 3 |  | 2 |
| sequence | 3 |  | 2 |
| treatment | 2 |  | 1 |
| Random Effects | subject(sequence) | 51 | Identity | 1 |
| Residual | |  |  | 1 |
| Total | | 60 |  | 8 |

|  |
| --- |
| 1. Dependent Variable: lnpk. |

|  |  |
| --- | --- |
| **Information Criteria1** | |
| -2 Restricted Log Likelihood | 316.05056716 |
| Akaike's Information Criterion (AIC) | 320.05056716 |
| Hurvich and Tsai's Criterion (AICC) | 320.13390049 |
| Bozdogan's Criterion (CAIC) | 328.03143233 |
| Schwarz's Bayesian Criterion (BIC) | 326.03143233 |

|  |
| --- |
| The information criteria are displayed in smaller-is-better form.1 |
| 1. Dependent Variable: lnpk. |

Fixed Effects

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| **Type III Tests of Fixed Effects1** | | | | |
| Source | **Numerator df** | **Denominator df** | **F** | **Sig.** |
| Intercept | 1 | 51.328 | 2164.993 | .000 |
| period | 2 | 99.000 | .116 | .891 |
| sequence | 2 | 48.000 | 2.066 | .138 |
| treatment | 1 | 99.000 | 11.992 | .001 |

|  |
| --- |
| 1. Dependent Variable: lnpk. |

Covariance Parameters

|  |  |  |  |
| --- | --- | --- | --- |
| **Estimates of Covariance Parameters1** | | | |
| Parameter | | **Estimate** | **Std. Error** |
| Residual | | .283772 | .040334 |
| subject(sequence) | Variance | .249284 | .071469 |

|  |
| --- |
| 1. Dependent Variable: lnpk. |

Estimated Marginal Means

treatment

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| **Estimates1** | | | | | |
| treatment | **Mean** | **Std. Error** | **df** | **95% Confidence Interval** | |
| **Lower Bound** | **Upper Bound** |
| R | 3.728 | .088 | 61.547 | 3.553 | 3.903 |
| T | 4.044 | .102 | 100.582 | 3.841 | 4.247 |

|  |
| --- |
| 1. Dependent Variable: lnpk. |

|  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- |
| **Pairwise Comparisons1** | | | | | | |
| (I) treatment | (J) treatment | **Mean Difference (I-J)** | **Std. Error** | **df** | **Sig.3** | **95% Confidence Interval for Difference3** |
| **Lower Bound** |
| T | R | .31637019\* | .09135779 | 99.00000000 | .00079058 | .13509652 |

|  |  |  |
| --- | --- | --- |
| **Pairwise Comparisons1** | | |
| (I) treatment | (J) treatment | 95% Confidence Interval for Difference |
| **Upper Bound** |
| T | R | .49764386 |

|  |
| --- |
| Based on estimated marginal means1 |
| \*. The mean difference is significant at the .05 level. |
| 1. Dependent Variable: lnpk. |
| 3. Adjustment for multiple comparisons: Least Significant Difference (equivalent to no adjustments). |

|  |  |  |  |
| --- | --- | --- | --- |
| **Univariate Tests1** | | | |
| **Numerator df** | **Denominator df** | **F** | **Sig.** |
| 1 | 99.000 | 11.992 | .001 |

|  |
| --- |
| The F tests the effect of treatment. This test is based on the linearly independent pairwise comparisons among the estimated marginal means.1 |
| 1. Dependent Variable: lnpk. |

MIXED lnpk BY period treatment sequence subject

/CRITERIA=CIN(90) MXITER(200) MXSTEP(20) SCORING(2) SINGULAR(0.000000000001) HCONVERGE(0,

RELATIVE) LCONVERGE(0.0000000000001, RELATIVE) PCONVERGE(0, RELATIVE)

/FIXED=period treatment sequence | SSTYPE(3)

/METHOD=REML

/RANDOM=treatment | SUBJECT(subject) COVTYPE(CSH)

/REPEATED=treatment | SUBJECT(subject\*period) COVTYPE(DIAG)

/EMMEANS=TABLES(treatment) COMPARE REFCAT(FIRST) ADJ(LSD).

Mixed Model Analysis

|  |  |  |
| --- | --- | --- |
| **Notes** | | |
| Output Created | | 28-FEB-2021 17:54:32 |
| Comments | |  |
| Input | Active Dataset | pkdataset |
| Filter | <none> |
| Weight | <none> |
| Split File | <none> |
| N of Rows in Working Data File | 153 |
| Missing Value Handling | Definition of Missing | User-defined missing values are treated as missing. |
| Cases Used | Statistics are based on all cases with valid data for all variables in the model. |
| Syntax | | MIXED lnpk BY period treatment sequence subject  /CRITERIA=CIN(90) MXITER(200) MXSTEP(20) SCORING(2) SINGULAR(0.000000000001) HCONVERGE(0,  RELATIVE) LCONVERGE(0.0000000000001, RELATIVE) PCONVERGE(0, RELATIVE)  /FIXED=period treatment sequence | SSTYPE(3)  /METHOD=REML  /RANDOM=treatment | SUBJECT(subject) COVTYPE(CSH)  /REPEATED=treatment | SUBJECT(subject\*period) COVTYPE(DIAG)  /EMMEANS=TABLES(treatment) COMPARE REFCAT(FIRST) ADJ(LSD). |
| Resources | Processor Time | 00:00:00.20 |
| Elapsed Time | 00:00:00.33 |

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| **Model Dimension1** | | | | | |
|  | | **Number of Levels** | **Covariance Structure** | **Number of Parameters** | **Subject Variables** |
| Fixed Effects | Intercept | 1 |  | 1 |  |
| period | 3 |  | 2 |  |
| treatment | 2 |  | 1 |  |
| sequence | 3 |  | 2 |  |
| Random Effects | treatment | 2 | Heterogeneous Compound Symmetry | 3 | subject |
| Repeated Effects | treatment | 2 | Diagonal | 2 | subject \* period |
| Total | | 13 |  | 11 |  |

|  |  |  |
| --- | --- | --- |
| **Model Dimension1** | | |
|  | | **Number of Subjects** |
| Fixed Effects | Intercept |  |
| period |  |
| treatment |  |
| sequence |  |
| Random Effects | treatment |  |
| Repeated Effects | treatment | 153 |
| Total | |  |

|  |
| --- |
| 1. Dependent Variable: lnpk. |

|  |  |
| --- | --- |
| **Information Criteria1** | |
| -2 Restricted Log Likelihood | 314.22176883 |
| Akaike's Information Criterion (AIC) | 324.22176883 |
| Hurvich and Tsai's Criterion (AICC) | 324.64730075 |
| Bozdogan's Criterion (CAIC) | 344.17393177 |
| Schwarz's Bayesian Criterion (BIC) | 339.17393177 |

|  |
| --- |
| The information criteria are displayed in smaller-is-better form.1 |
| 1. Dependent Variable: lnpk. |

Fixed Effects

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| **Type III Tests of Fixed Effects1** | | | | |
| Source | **Numerator df** | **Denominator df** | **F** | **Sig.** |
| Intercept | 1 | 48.101 | 2062.319 | .000 |
| period | 2 | 95.501 | .149 | .862 |
| treatment | 1 | 47.280 | 13.473 | .001 |
| sequence | 2 | 48.607 | 1.942 | .154 |

|  |
| --- |
| 1. Dependent Variable: lnpk. |

Covariance Parameters

|  |  |  |  |
| --- | --- | --- | --- |
| **Estimates of Covariance Parameters1** | | | |
| Parameter | | **Estimate** | **Std. Error** |
| Repeated Measures | Var: [treatment=R] | .314 | .063 |
| Var: [treatment=T] | .060 | 870.862 |
| treatment [subject = subject] | Var: [treatment=R] | .191 | .078 |
| Var: [treatment=T] | .529 | 870.855 |
| CSH rho | .878 | 723.249 |

|  |
| --- |
| 1. Dependent Variable: lnpk. |

Estimated Marginal Means

treatment

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| **Estimates1** | | | | | |
| treatment | **Mean** | **Std. Error** | **df** | **90% Confidence Interval** | |
| **Lower Bound** | **Upper Bound** |
| R | 3.728 | .083 | 48.036 | 3.589 | 3.866 |
| T | 4.044 | .107 | 48.255 | 3.864 | 4.224 |

|  |
| --- |
| 1. Dependent Variable: lnpk. |

|  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- |
| **Pairwise Comparisons1** | | | | | | |
| (I) treatment | (J) treatment | **Mean Difference (I-J)** | **Std. Error** | **df** | **Sig.3** | **90% Confidence Interval for Difference3** |
| **Lower Bound** |
| T | R | .31637019\* | .08618981 | 47.28013629 | .00061410 | .17176722 |

|  |  |  |
| --- | --- | --- |
| **Pairwise Comparisons1** | | |
| (I) treatment | (J) treatment | 90% Confidence Interval for Difference |
| **Upper Bound** |
| T | R | .46097316 |

|  |
| --- |
| Based on estimated marginal means1 |
| \*. The mean difference is significant at the .10 level. |
| 1. Dependent Variable: lnpk. |
| 3. Adjustment for multiple comparisons: Least Significant Difference (equivalent to no adjustments). |

|  |  |  |  |
| --- | --- | --- | --- |
| **Univariate Tests1** | | | |
| **Numerator df** | **Denominator df** | **F** | **Sig.** |
| 1 | 47.280 | 13.473 | .001 |

|  |
| --- |
| The F tests the effect of treatment. This test is based on the linearly independent pairwise comparisons among the estimated marginal means.1 |
| 1. Dependent Variable: lnpk. |

DATASET CLOSE pkdataset.

TITLE "RDS05".

RDS05

GET DATA

/TYPE=XLSX

/FILE='.\rds01.xlsx'

/SHEET=name 'rds05'

/CELLRANGE=FULL

/READNAMES=ON

/LEADINGSPACES IGNORE=YES

/TRAILINGSPACES IGNORE=YES

/DATATYPEMIN PERCENTAGE=95.0

/HIDDEN IGNORE=YES.

EXECUTE.

DATASET NAME pkdataset WINDOW=FRONT.

COMPUTE lnpk=ln(PK).

EXECUTE.

UNIANOVA lnpk BY period sequence treatment subject

/RANDOM subject

/CONTRAST(treatment)=Simple(1)

/METHOD=SSTYPE(3)

/INTERCEPT=INCLUDE

/CRITERIA=ALPHA(0.05)

/DESIGN=period sequence treatment subject(sequence).

Univariate Analysis of Variance

|  |  |  |
| --- | --- | --- |
| **Notes** | | |
| Output Created | | 28-FEB-2021 17:54:33 |
| Comments | |  |
| Input | Active Dataset | pkdataset |
| Filter | <none> |
| Weight | <none> |
| Split File | <none> |
| N of Rows in Working Data File | 104 |
| Missing Value Handling | Definition of Missing | User-defined missing values are treated as missing. |
| Cases Used | Statistics are based on all cases with valid data for all variables in the model. |
| Syntax | | UNIANOVA lnpk BY period sequence treatment subject  /RANDOM subject  /CONTRAST(treatment)=Simple(1)  /METHOD=SSTYPE(3)  /INTERCEPT=INCLUDE  /CRITERIA=ALPHA(0.05)  /DESIGN=period sequence treatment subject(sequence). |
| Resources | Processor Time | 00:00:00.06 |
| Elapsed Time | 00:00:00.02 |

|  |  |  |
| --- | --- | --- |
| **Between-Subjects Factors** | | |
|  | | **N** |
| period | 1 | 26 |
| 2 | 26 |
| 3 | 26 |
| 4 | 26 |
| sequence | RTTR | 52 |
| TRRT | 52 |
| treatment | R | 52 |
| T | 52 |
| subject | 1 | 4 |
| 2 | 4 |
| 3 | 4 |
| 4 | 4 |
| 5 | 4 |
| 6 | 4 |
| 7 | 4 |
| 8 | 4 |
| 9 | 4 |
| 10 | 4 |
| 11 | 4 |
| 12 | 4 |
| 13 | 4 |
| 14 | 4 |
| 15 | 4 |
| 16 | 4 |
| 17 | 4 |
| 18 | 4 |
| 19 | 4 |
| 20 | 4 |
| 21 | 4 |
| 22 | 4 |
| 23 | 4 |
| 24 | 4 |
| 25 | 4 |
| 26 | 4 |

|  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- |
| **Tests of Between-Subjects Effects** | | | | | | |
| Dependent Variable: lnpk | | | | | | |
| Source | | **Type III Sum of Squares** | **df** | **Mean Square** | **F** | **Sig.** |
| Intercept | Hypothesis | 50.871 | 1 | 50.871 | 483.228 | .000 |
| Error | 2.527 | 24 | .1051 |  |  |
| period | Hypothesis | .069 | 3 | .023 | 1.699 | .175 |
| Error | 1.004 | 74 | .0142 |  |  |
| sequence | Hypothesis | .092 | 1 | .092 | .878 | .358 |
| Error | 2.527 | 24 | .1051 |  |  |
| treatment | Hypothesis | .149 | 1 | .149 | 10.944 | .001 |
| Error | 1.004 | 74 | .0142 |  |  |
| subject(sequence) | Hypothesis | 2.527 | 24 | .105 | 7.756 | .000 |
| Error | 1.004 | 74 | .0142 |  |  |

|  |
| --- |
| 1. MS(subject(sequence)) |
| 2. MS(Error) |

|  |  |  |  |
| --- | --- | --- | --- |
| **Expected Mean Squares1,2** | | | |
| Source | **Variance Component** | | |
| **Var(subject(sequence))** | **Var(Error)** | **Quadratic Term** |
| Intercept | 4.000 | 1.000 | Intercept, period, sequence, treatment |
| period | .000 | 1.000 | period |
| sequence | 4.000 | 1.000 | sequence |
| treatment | .000 | 1.000 | treatment |
| subject(sequence) | 4.000 | 1.000 |  |
| Error | .000 | 1.000 |  |

|  |
| --- |
| 1. For each source, the expected mean square equals the sum of the coefficients in the cells times the variance components, plus a quadratic term involving effects in the Quadratic Term cell. |
| 2. Expected Mean Squares are based on the Type III Sums of Squares. |

Custom Hypothesis Tests

|  |  |  |  |
| --- | --- | --- | --- |
| **Contrast Results (K Matrix)** | | | |
| treatment Simple Contrast1 | | | **Dependent Variable** |
| **lnpk** |
| Level 2 vs. Level 1 | Contrast Estimate | | .076 |
| Hypothesized Value | | 0 |
| Difference (Estimate - Hypothesized) | | .076 |
| Std. Error | | .023 |
| Sig. | | .001 |
| 95% Confidence Interval for Difference | Lower Bound | .030 |
| Upper Bound | .121 |

|  |
| --- |
| 1. Reference category = 1 |

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| **Test Results** | | | | | |
| Dependent Variable: lnpk | | | | | |
| Source | **Sum of Squares** | **df** | **Mean Square** | **F** | **Sig.** |
| Contrast | .149 | 1 | .149 | 10.944 | .001 |
| Error | 1.004 | 74 | .014 |  |  |

MIXED lnpk BY period sequence treatment subject

/CRITERIA=DFMETHOD(SATTERTHWAITE) CIN(95) MXITER(100) MXSTEP(10) SCORING(1)

SINGULAR(0.000000000001) HCONVERGE(0, ABSOLUTE) LCONVERGE(0, ABSOLUTE) PCONVERGE(0.000001, ABSOLUTE)

/FIXED=period sequence treatment | SSTYPE(3)

/METHOD=REML

/RANDOM= subject(sequence) | COVTYPE(ID)

/EMMEANS=TABLES(treatment) COMPARE REFCAT(FIRST) ADJ(LSD).

Mixed Model Analysis

|  |  |  |
| --- | --- | --- |
| **Notes** | | |
| Output Created | | 28-FEB-2021 17:54:33 |
| Comments | |  |
| Input | Active Dataset | pkdataset |
| Filter | <none> |
| Weight | <none> |
| Split File | <none> |
| N of Rows in Working Data File | 104 |
| Missing Value Handling | Definition of Missing | User-defined missing values are treated as missing. |
| Cases Used | Statistics are based on all cases with valid data for all variables in the model. |
| Syntax | | MIXED lnpk BY period sequence treatment subject  /CRITERIA=DFMETHOD(SATTERTHWAITE) CIN(95) MXITER(100) MXSTEP(10) SCORING(1)  SINGULAR(0.000000000001) HCONVERGE(0, ABSOLUTE) LCONVERGE(0, ABSOLUTE) PCONVERGE(0.000001, ABSOLUTE)  /FIXED=period sequence treatment | SSTYPE(3)  /METHOD=REML  /RANDOM= subject(sequence) | COVTYPE(ID)  /EMMEANS=TABLES(treatment) COMPARE REFCAT(FIRST) ADJ(LSD). |
| Resources | Processor Time | 00:00:00.13 |
| Elapsed Time | 00:00:00.08 |

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| **Model Dimension1** | | | | |
|  | | **Number of Levels** | **Covariance Structure** | **Number of Parameters** |
| Fixed Effects | Intercept | 1 |  | 1 |
| period | 4 |  | 3 |
| sequence | 2 |  | 1 |
| treatment | 2 |  | 1 |
| Random Effects | subject(sequence) | 26 | Identity | 1 |
| Residual | |  |  | 1 |
| Total | | 35 |  | 8 |

|  |
| --- |
| 1. Dependent Variable: lnpk. |

|  |  |
| --- | --- |
| **Information Criteria1** | |
| -2 Restricted Log Likelihood | -74.54174147 |
| Akaike's Information Criterion (AIC) | -70.54174147 |
| Hurvich and Tsai's Criterion (AICC) | -70.41542568 |
| Bozdogan's Criterion (CAIC) | -63.37180651 |
| Schwarz's Bayesian Criterion (BIC) | -65.37180651 |

|  |
| --- |
| The information criteria are displayed in smaller-is-better form.1 |
| 1. Dependent Variable: lnpk. |

Fixed Effects

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| **Type III Tests of Fixed Effects1** | | | | |
| Source | **Numerator df** | **Denominator df** | **F** | **Sig.** |
| Intercept | 1 | 24 | 483.228 | .000 |
| period | 3 | 74 | 1.699 | .175 |
| sequence | 1 | 24 | .878 | .358 |
| treatment | 1 | 74 | 10.944 | .001 |

|  |
| --- |
| 1. Dependent Variable: lnpk. |

Covariance Parameters

|  |  |  |  |
| --- | --- | --- | --- |
| **Estimates of Covariance Parameters1** | | | |
| Parameter | | **Estimate** | **Std. Error** |
| Residual | | .013573 | .002231 |
| subject(sequence) | Variance | .022925 | .007618 |

|  |
| --- |
| 1. Dependent Variable: lnpk. |

Estimated Marginal Means

treatment

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| **Estimates1** | | | | | |
| treatment | **Mean** | **Std. Error** | **df** | **95% Confidence Interval** | |
| **Lower Bound** | **Upper Bound** |
| R | .662 | .034 | 30.424 | .593 | .731 |
| T | .737 | .034 | 30.424 | .668 | .806 |

|  |
| --- |
| 1. Dependent Variable: lnpk. |

|  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- |
| **Pairwise Comparisons1** | | | | | | |
| (I) treatment | (J) treatment | **Mean Difference (I-J)** | **Std. Error** | **df** | **Sig.3** | **95% Confidence Interval for Difference3** |
| **Lower Bound** |
| T | R | .07558802\* | .02284851 | 74.00000000 | .00145167 | .03006137 |

|  |  |  |
| --- | --- | --- |
| **Pairwise Comparisons1** | | |
| (I) treatment | (J) treatment | 95% Confidence Interval for Difference |
| **Upper Bound** |
| T | R | .12111468 |

|  |
| --- |
| Based on estimated marginal means1 |
| \*. The mean difference is significant at the .05 level. |
| 1. Dependent Variable: lnpk. |
| 3. Adjustment for multiple comparisons: Least Significant Difference (equivalent to no adjustments). |

|  |  |  |  |
| --- | --- | --- | --- |
| **Univariate Tests1** | | | |
| **Numerator df** | **Denominator df** | **F** | **Sig.** |
| 1 | 74 | 10.944 | .001 |

|  |
| --- |
| The F tests the effect of treatment. This test is based on the linearly independent pairwise comparisons among the estimated marginal means.1 |
| 1. Dependent Variable: lnpk. |

MIXED lnpk BY period treatment sequence subject

/CRITERIA=CIN(90) MXITER(200) MXSTEP(20) SCORING(2) SINGULAR(0.000000000001) HCONVERGE(0,

RELATIVE) LCONVERGE(0.0000000000001, RELATIVE) PCONVERGE(0, RELATIVE)

/FIXED=period treatment sequence | SSTYPE(3)

/METHOD=REML

/RANDOM=treatment | SUBJECT(subject) COVTYPE(CSH)

/REPEATED=treatment | SUBJECT(subject\*period) COVTYPE(DIAG)

/EMMEANS=TABLES(treatment) COMPARE REFCAT(FIRST) ADJ(LSD).

Mixed Model Analysis

|  |  |  |
| --- | --- | --- |
| **Notes** | | |
| Output Created | | 28-FEB-2021 17:54:33 |
| Comments | |  |
| Input | Active Dataset | pkdataset |
| Filter | <none> |
| Weight | <none> |
| Split File | <none> |
| N of Rows in Working Data File | 104 |
| Missing Value Handling | Definition of Missing | User-defined missing values are treated as missing. |
| Cases Used | Statistics are based on all cases with valid data for all variables in the model. |
| Syntax | | MIXED lnpk BY period treatment sequence subject  /CRITERIA=CIN(90) MXITER(200) MXSTEP(20) SCORING(2) SINGULAR(0.000000000001) HCONVERGE(0,  RELATIVE) LCONVERGE(0.0000000000001, RELATIVE) PCONVERGE(0, RELATIVE)  /FIXED=period treatment sequence | SSTYPE(3)  /METHOD=REML  /RANDOM=treatment | SUBJECT(subject) COVTYPE(CSH)  /REPEATED=treatment | SUBJECT(subject\*period) COVTYPE(DIAG)  /EMMEANS=TABLES(treatment) COMPARE REFCAT(FIRST) ADJ(LSD). |
| Resources | Processor Time | 00:00:00.27 |
| Elapsed Time | 00:00:00.26 |

|  |
| --- |
| **Warnings** |
| Iteration was terminated but convergence has not been achieved. The MIXED procedure continues despite this warning. Subsequent results produced are based on the last iteration. Validity of the model fit is uncertain. |

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| **Model Dimension1** | | | | | |
|  | | **Number of Levels** | **Covariance Structure** | **Number of Parameters** | **Subject Variables** |
| Fixed Effects | Intercept | 1 |  | 1 |  |
| period | 4 |  | 3 |  |
| treatment | 2 |  | 1 |  |
| sequence | 2 |  | 1 |  |
| Random Effects | treatment | 2 | Heterogeneous Compound Symmetry | 3 | subject |
| Repeated Effects | treatment | 2 | Diagonal | 2 | subject \* period |
| Total | | 13 |  | 11 |  |

|  |  |  |
| --- | --- | --- |
| **Model Dimension1** | | |
|  | | **Number of Subjects** |
| Fixed Effects | Intercept |  |
| period |  |
| treatment |  |
| sequence |  |
| Random Effects | treatment |  |
| Repeated Effects | treatment | 104 |
| Total | |  |

|  |
| --- |
| 1. Dependent Variable: lnpk. |

|  |  |
| --- | --- |
| **Information Criteria1** | |
| -2 Restricted Log Likelihood | -74.87997833 |
| Akaike's Information Criterion (AIC) | -64.87997833 |
| Hurvich and Tsai's Criterion (AICC) | -64.22780442 |
| Bozdogan's Criterion (CAIC) | -46.95514094 |
| Schwarz's Bayesian Criterion (BIC) | -51.95514094 |

|  |
| --- |
| The information criteria are displayed in smaller-is-better form.1 |
| 1. Dependent Variable: lnpk. |

Fixed Effects

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| **Type III Tests of Fixed Effects1** | | | | |
| Source | **Numerator df** | **Denominator df** | **F** | **Sig.** |
| Intercept | 1 | 18.372 | 483.224 | .000 |
| period | 3 | 74.700 | 1.678 | .179 |
| treatment | 1 | 75.988 | 10.847 | .002 |
| sequence | 1 | 18.372 | .878 | .361 |

|  |
| --- |
| 1. Dependent Variable: lnpk. |

Covariance Parameters

|  |  |  |  |
| --- | --- | --- | --- |
| **Estimates of Covariance Parameters1** | | | |
| Parameter | | **Estimate** | **Std. Error** |
| Repeated Measures | Var: [treatment=R] | .013 | .003 |
| Var: [treatment=T] | .014 | .004 |
| treatment [subject = subject] | Var: [treatment=R] | .021 | .008 |
| Var: [treatment=T] | .025 | .009 |
| CSH rho | 1.0002 | .000 |

|  |
| --- |
| 1. Dependent Variable: lnpk. |
| 2. This covariance parameter is redundant. |

Estimated Marginal Means

treatment

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| **Estimates1** | | | | | |
| treatment | **Mean** | **Std. Error** | **df** | **90% Confidence Interval** | |
| **Lower Bound** | **Upper Bound** |
| R | .662 | .033 | 24.368 | .606 | .717 |
| T | .737 | .035 | 21.507 | .677 | .797 |

|  |
| --- |
| 1. Dependent Variable: lnpk. |

|  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- |
| **Pairwise Comparisons1** | | | | | | |
| (I) treatment | (J) treatment | **Mean Difference (I-J)** | **Std. Error** | **df** | **Sig.3** | **90% Confidence Interval for Difference3** |
| **Lower Bound** |
| T | R | .07558802\* | .02295067 | 75.98775307 | .00150395 | .03737161 |

|  |  |  |
| --- | --- | --- |
| **Pairwise Comparisons1** | | |
| (I) treatment | (J) treatment | 90% Confidence Interval for Difference |
| **Upper Bound** |
| T | R | .11380443 |

|  |
| --- |
| Based on estimated marginal means1 |
| \*. The mean difference is significant at the .10 level. |
| 1. Dependent Variable: lnpk. |
| 3. Adjustment for multiple comparisons: Least Significant Difference (equivalent to no adjustments). |

|  |  |  |  |
| --- | --- | --- | --- |
| **Univariate Tests1** | | | |
| **Numerator df** | **Denominator df** | **F** | **Sig.** |
| 1 | 75.988 | 10.847 | .002 |

|  |
| --- |
| The F tests the effect of treatment. This test is based on the linearly independent pairwise comparisons among the estimated marginal means.1 |
| 1. Dependent Variable: lnpk. |

DATASET CLOSE pkdataset.

TITLE "RDS06".

RDS06

GET DATA

/TYPE=XLSX

/FILE='.\rds01.xlsx'

/SHEET=name 'rds06'

/CELLRANGE=FULL

/READNAMES=ON

/LEADINGSPACES IGNORE=YES

/TRAILINGSPACES IGNORE=YES

/DATATYPEMIN PERCENTAGE=95.0

/HIDDEN IGNORE=YES.

EXECUTE.

DATASET NAME pkdataset WINDOW=FRONT.

COMPUTE lnpk=ln(PK).

EXECUTE.

UNIANOVA lnpk BY period sequence treatment subject

/RANDOM subject

/CONTRAST(treatment)=Simple(1)

/METHOD=SSTYPE(3)

/INTERCEPT=INCLUDE

/CRITERIA=ALPHA(0.05)

/DESIGN=period sequence treatment subject(sequence).

Univariate Analysis of Variance

|  |  |  |
| --- | --- | --- |
| **Notes** | | |
| Output Created | | 28-FEB-2021 17:54:34 |
| Comments | |  |
| Input | Active Dataset | pkdataset |
| Filter | <none> |
| Weight | <none> |
| Split File | <none> |
| N of Rows in Working Data File | 298 |
| Missing Value Handling | Definition of Missing | User-defined missing values are treated as missing. |
| Cases Used | Statistics are based on all cases with valid data for all variables in the model. |
| Syntax | | UNIANOVA lnpk BY period sequence treatment subject  /RANDOM subject  /CONTRAST(treatment)=Simple(1)  /METHOD=SSTYPE(3)  /INTERCEPT=INCLUDE  /CRITERIA=ALPHA(0.05)  /DESIGN=period sequence treatment subject(sequence). |
| Resources | Processor Time | 00:00:00.02 |
| Elapsed Time | 00:00:00.04 |

|  |  |  |
| --- | --- | --- |
| **Between-Subjects Factors** | | |
|  | | **N** |
| period | 1 | 77 |
| 2 | 76 |
| 3 | 70 |
| 4 | 75 |
| sequence | RTRT | 149 |
| TRTR | 149 |
| treatment | R | 148 |
| T | 150 |
| subject | 1 | 4 |
| 2 | 4 |
| 3 | 4 |
| 4 | 4 |
| 5 | 4 |
| 6 | 4 |
| 7 | 4 |
| 8 | 4 |
| 9 | 4 |
| 10 | 4 |
| 11 | 3 |
| 12 | 4 |
| 13 | 4 |
| 14 | 4 |
| 15 | 4 |
| 16 | 4 |
| 17 | 4 |
| 18 | 4 |
| 19 | 4 |
| 20 | 3 |
| 21 | 4 |
| 22 | 4 |
| 23 | 4 |
| 24 | 3 |
| 25 | 4 |
| 26 | 4 |
| 27 | 4 |
| 28 | 4 |
| 29 | 4 |
| 30 | 4 |
| 31 | 3 |
| 32 | 4 |
| 33 | 4 |
| 34 | 4 |
| 35 | 4 |
| 36 | 4 |
| 37 | 4 |
| 38 | 4 |
| 39 | 4 |
| 40 | 4 |
| 41 | 4 |
| 42 | 3 |
| 43 | 4 |
| 44 | 4 |
| 45 | 4 |
| 46 | 4 |
| 47 | 4 |
| 48 | 4 |
| 49 | 4 |
| 50 | 4 |
| 51 | 4 |
| 52 | 4 |
| 53 | 4 |
| 54 | 4 |
| 55 | 4 |
| 56 | 4 |
| 57 | 4 |
| 58 | 4 |
| 59 | 4 |
| 60 | 4 |
| 62 | 4 |
| 63 | 4 |
| 64 | 4 |
| 65 | 4 |
| 66 | 4 |
| 67 | 2 |
| 68 | 4 |
| 69 | 3 |
| 70 | 4 |
| 71 | 2 |
| 72 | 4 |
| 73 | 4 |
| 74 | 4 |
| 75 | 4 |
| 76 | 4 |
| 77 | 4 |
| 78 | 4 |

|  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- |
| **Tests of Between-Subjects Effects** | | | | | | |
| Dependent Variable: lnpk | | | | | | |
| Source | | **Type III Sum of Squares** | **df** | **Mean Square** | **F** | **Sig.** |
| Intercept | Hypothesis | 17499.273 | 1 | 17499.273 | 6243.584 | .000 |
| Error | 210.673 | 75.166 | 2.8031 |  |  |
| period | Hypothesis | .375 | 3 | .125 | .781 | .506 |
| Error | 34.719 | 217 | .1602 |  |  |
| sequence | Hypothesis | .039 | 1 | .039 | .014 | .907 |
| Error | 211.073 | 75.147 | 2.8093 |  |  |
| treatment | Hypothesis | 1.565 | 1 | 1.565 | 9.784 | .002 |
| Error | 34.719 | 217 | .1602 |  |  |
| subject(sequence) | Hypothesis | 214.130 | 75 | 2.855 | 17.845 | .000 |
| Error | 34.719 | 217 | .1602 |  |  |

|  |
| --- |
| 1. .981 MS(subject(sequence)) + .019 MS(Error) |
| 2. MS(Error) |
| 3. .983 MS(subject(sequence)) + .017 MS(Error) |

|  |  |  |  |
| --- | --- | --- | --- |
| **Expected Mean Squares1,2** | | | |
| Source | **Variance Component** | | |
| **Var(subject(sequence))** | **Var(Error)** | **Quadratic Term** |
| Intercept | 3.793 | 1.000 | Intercept, period, sequence, treatment |
| period | .000 | 1.000 | period |
| sequence | 3.801 | 1.000 | sequence |
| treatment | .000 | 1.000 | treatment |
| subject(sequence) | 3.868 | 1.000 |  |
| Error | .000 | 1.000 |  |

|  |
| --- |
| 1. For each source, the expected mean square equals the sum of the coefficients in the cells times the variance components, plus a quadratic term involving effects in the Quadratic Term cell. |
| 2. Expected Mean Squares are based on the Type III Sums of Squares. |

Custom Hypothesis Tests

|  |  |  |  |
| --- | --- | --- | --- |
| **Contrast Results (K Matrix)** | | | |
| treatment Simple Contrast1 | | | **Dependent Variable** |
| **lnpk** |
| Level 2 vs. Level 1 | Contrast Estimate | | -.145 |
| Hypothesized Value | | 0 |
| Difference (Estimate - Hypothesized) | | -.145 |
| Std. Error | | .047 |
| Sig. | | .002 |
| 95% Confidence Interval for Difference | Lower Bound | -.237 |
| Upper Bound | -.054 |

|  |
| --- |
| 1. Reference category = 1 |

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| **Test Results** | | | | | |
| Dependent Variable: lnpk | | | | | |
| Source | **Sum of Squares** | **df** | **Mean Square** | **F** | **Sig.** |
| Contrast | 1.565 | 1 | 1.565 | 9.784 | .002 |
| Error | 34.719 | 217 | .160 |  |  |

MIXED lnpk BY period sequence treatment subject

/CRITERIA=DFMETHOD(SATTERTHWAITE) CIN(95) MXITER(100) MXSTEP(10) SCORING(1)

SINGULAR(0.000000000001) HCONVERGE(0, ABSOLUTE) LCONVERGE(0, ABSOLUTE) PCONVERGE(0.000001, ABSOLUTE)

/FIXED=period sequence treatment | SSTYPE(3)

/METHOD=REML

/RANDOM= subject(sequence) | COVTYPE(ID)

/EMMEANS=TABLES(treatment) COMPARE REFCAT(FIRST) ADJ(LSD).

Mixed Model Analysis

|  |  |  |
| --- | --- | --- |
| **Notes** | | |
| Output Created | | 28-FEB-2021 17:54:34 |
| Comments | |  |
| Input | Active Dataset | pkdataset |
| Filter | <none> |
| Weight | <none> |
| Split File | <none> |
| N of Rows in Working Data File | 298 |
| Missing Value Handling | Definition of Missing | User-defined missing values are treated as missing. |
| Cases Used | Statistics are based on all cases with valid data for all variables in the model. |
| Syntax | | MIXED lnpk BY period sequence treatment subject  /CRITERIA=DFMETHOD(SATTERTHWAITE) CIN(95) MXITER(100) MXSTEP(10) SCORING(1)  SINGULAR(0.000000000001) HCONVERGE(0, ABSOLUTE) LCONVERGE(0, ABSOLUTE) PCONVERGE(0.000001, ABSOLUTE)  /FIXED=period sequence treatment | SSTYPE(3)  /METHOD=REML  /RANDOM= subject(sequence) | COVTYPE(ID)  /EMMEANS=TABLES(treatment) COMPARE REFCAT(FIRST) ADJ(LSD). |
| Resources | Processor Time | 00:00:00.17 |
| Elapsed Time | 00:00:00.21 |

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| **Model Dimension1** | | | | |
|  | | **Number of Levels** | **Covariance Structure** | **Number of Parameters** |
| Fixed Effects | Intercept | 1 |  | 1 |
| period | 4 |  | 3 |
| sequence | 2 |  | 1 |
| treatment | 2 |  | 1 |
| Random Effects | subject(sequence) | 77 | Identity | 1 |
| Residual | |  |  | 1 |
| Total | | 86 |  | 8 |

|  |
| --- |
| 1. Dependent Variable: lnpk. |

|  |  |
| --- | --- |
| **Information Criteria1** | |
| -2 Restricted Log Likelihood | 536.20114880 |
| Akaike's Information Criterion (AIC) | 540.20114880 |
| Hurvich and Tsai's Criterion (AICC) | 540.24267129 |
| Bozdogan's Criterion (CAIC) | 549.55465640 |
| Schwarz's Bayesian Criterion (BIC) | 547.55465640 |

|  |
| --- |
| The information criteria are displayed in smaller-is-better form.1 |
| 1. Dependent Variable: lnpk. |

Fixed Effects

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| **Type III Tests of Fixed Effects1** | | | | |
| Source | **Numerator df** | **Denominator df** | **F** | **Sig.** |
| Intercept | 1 | 74.738 | 6161.892 | .000 |
| period | 3 | 217.118 | .829 | .479 |
| sequence | 1 | 74.721 | .012 | .913 |
| treatment | 1 | 216.939 | 9.865 | .002 |

|  |
| --- |
| 1. Dependent Variable: lnpk. |

Covariance Parameters

|  |  |  |  |
| --- | --- | --- | --- |
| **Estimates of Covariance Parameters1** | | | |
| Parameter | | **Estimate** | **Std. Error** |
| Residual | | .160100 | .015379 |
| subject(sequence) | Variance | .706938 | .122602 |

|  |
| --- |
| 1. Dependent Variable: lnpk. |

Estimated Marginal Means

treatment

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| **Estimates1** | | | | | |
| treatment | **Mean** | **Std. Error** | **df** | **95% Confidence Interval** | |
| **Lower Bound** | **Upper Bound** |
| R | 7.816 | .101 | 83.355 | 7.614 | 8.018 |
| T | 7.670 | .101 | 83.037 | 7.469 | 7.871 |

|  |
| --- |
| 1. Dependent Variable: lnpk. |

|  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- |
| **Pairwise Comparisons1** | | | | | | |
| (I) treatment | (J) treatment | **Mean Difference (I-J)** | **Std. Error** | **df** | **Sig.3** | **95% Confidence Interval for Difference3** |
| **Lower Bound** |
| T | R | -.14608818\* | .04651301 | 216.93862184 | .00191967 | -.23776343 |

|  |  |  |
| --- | --- | --- |
| **Pairwise Comparisons1** | | |
| (I) treatment | (J) treatment | 95% Confidence Interval for Difference |
| **Upper Bound** |
| T | R | -.05441293 |

|  |
| --- |
| Based on estimated marginal means1 |
| \*. The mean difference is significant at the .05 level. |
| 1. Dependent Variable: lnpk. |
| 3. Adjustment for multiple comparisons: Least Significant Difference (equivalent to no adjustments). |

|  |  |  |  |
| --- | --- | --- | --- |
| **Univariate Tests1** | | | |
| **Numerator df** | **Denominator df** | **F** | **Sig.** |
| 1 | 216.939 | 9.865 | .002 |

|  |
| --- |
| The F tests the effect of treatment. This test is based on the linearly independent pairwise comparisons among the estimated marginal means.1 |
| 1. Dependent Variable: lnpk. |

MIXED lnpk BY period treatment sequence subject

/CRITERIA=CIN(90) MXITER(200) MXSTEP(20) SCORING(2) SINGULAR(0.000000000001) HCONVERGE(0,

RELATIVE) LCONVERGE(0.0000000000001, RELATIVE) PCONVERGE(0, RELATIVE)

/FIXED=period treatment sequence | SSTYPE(3)

/METHOD=REML

/RANDOM=treatment | SUBJECT(subject) COVTYPE(CSH)

/REPEATED=treatment | SUBJECT(subject\*period) COVTYPE(DIAG)

/EMMEANS=TABLES(treatment) COMPARE REFCAT(FIRST) ADJ(LSD).

Mixed Model Analysis

|  |  |  |
| --- | --- | --- |
| **Notes** | | |
| Output Created | | 28-FEB-2021 17:54:34 |
| Comments | |  |
| Input | Active Dataset | pkdataset |
| Filter | <none> |
| Weight | <none> |
| Split File | <none> |
| N of Rows in Working Data File | 298 |
| Missing Value Handling | Definition of Missing | User-defined missing values are treated as missing. |
| Cases Used | Statistics are based on all cases with valid data for all variables in the model. |
| Syntax | | MIXED lnpk BY period treatment sequence subject  /CRITERIA=CIN(90) MXITER(200) MXSTEP(20) SCORING(2) SINGULAR(0.000000000001) HCONVERGE(0,  RELATIVE) LCONVERGE(0.0000000000001, RELATIVE) PCONVERGE(0, RELATIVE)  /FIXED=period treatment sequence | SSTYPE(3)  /METHOD=REML  /RANDOM=treatment | SUBJECT(subject) COVTYPE(CSH)  /REPEATED=treatment | SUBJECT(subject\*period) COVTYPE(DIAG)  /EMMEANS=TABLES(treatment) COMPARE REFCAT(FIRST) ADJ(LSD). |
| Resources | Processor Time | 00:00:00.14 |
| Elapsed Time | 00:00:00.18 |

|  |
| --- |
| **Warnings** |
| The final Hessian matrix is not positive definite although all convergence criteria are satisfied. The MIXED procedure continues despite this warning. Validity of subsequent results cannot be ascertained. |

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| **Model Dimension1** | | | | | |
|  | | **Number of Levels** | **Covariance Structure** | **Number of Parameters** | **Subject Variables** |
| Fixed Effects | Intercept | 1 |  | 1 |  |
| period | 4 |  | 3 |  |
| treatment | 2 |  | 1 |  |
| sequence | 2 |  | 1 |  |
| Random Effects | treatment | 2 | Heterogeneous Compound Symmetry | 3 | subject |
| Repeated Effects | treatment | 2 | Diagonal | 2 | subject \* period |
| Total | | 13 |  | 11 |  |

|  |  |  |
| --- | --- | --- |
| **Model Dimension1** | | |
|  | | **Number of Subjects** |
| Fixed Effects | Intercept |  |
| period |  |
| treatment |  |
| sequence |  |
| Random Effects | treatment |  |
| Repeated Effects | treatment | 298 |
| Total | |  |

|  |
| --- |
| 1. Dependent Variable: lnpk. |

|  |  |
| --- | --- |
| **Information Criteria1** | |
| -2 Restricted Log Likelihood | 530.14451859 |
| Akaike's Information Criterion (AIC) | 540.14451859 |
| Hurvich and Tsai's Criterion (AICC) | 540.35430880 |
| Bozdogan's Criterion (CAIC) | 563.52828760 |
| Schwarz's Bayesian Criterion (BIC) | 558.52828760 |

|  |
| --- |
| The information criteria are displayed in smaller-is-better form.1 |
| 1. Dependent Variable: lnpk. |

Fixed Effects

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| **Type III Tests of Fixed Effects1** | | | | |
| Source | **Numerator df** | **Denominator df** | **F** | **Sig.** |
| Intercept | 1 | 70.348 | 6165.029 | .000 |
| period | 3 | 208.643 | .545 | .652 |
| treatment | 1 | 209.440 | 9.786 | .002 |
| sequence | 1 | 70.334 | .011 | .918 |

|  |
| --- |
| 1. Dependent Variable: lnpk. |

Covariance Parameters

|  |  |  |  |
| --- | --- | --- | --- |
| **Estimates of Covariance Parameters1** | | | |
| Parameter | | **Estimate** | **Std. Error** |
| Repeated Measures | Var: [treatment=R] | .117 | .019 |
| Var: [treatment=T] | .202 | .029 |
| treatment [subject = subject] | Var: [treatment=R] | .686 | .123 |
| Var: [treatment=T] | .728 | .136 |
| CSH rho | 1.0002 | .000 |

|  |
| --- |
| 1. Dependent Variable: lnpk. |
| 2. This covariance parameter is redundant. |

Estimated Marginal Means

treatment

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| **Estimates1** | | | | | |
| treatment | **Mean** | **Std. Error** | **df** | **90% Confidence Interval** | |
| **Lower Bound** | **Upper Bound** |
| R | 7.816 | .099 | 74.943 | 7.652 | 7.980 |
| T | 7.670 | .104 | 80.374 | 7.497 | 7.843 |

|  |
| --- |
| 1. Dependent Variable: lnpk. |

|  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- |
| **Pairwise Comparisons1** | | | | | | |
| (I) treatment | (J) treatment | **Mean Difference (I-J)** | **Std. Error** | **df** | **Sig.3** | **90% Confidence Interval for Difference3** |
| **Lower Bound** |
| T | R | -.14546428\* | .04650124 | 209.43956694 | .00200924 | -.22229183 |

|  |  |  |
| --- | --- | --- |
| **Pairwise Comparisons1** | | |
| (I) treatment | (J) treatment | 90% Confidence Interval for Difference |
| **Upper Bound** |
| T | R | -.06863672 |

|  |
| --- |
| Based on estimated marginal means1 |
| \*. The mean difference is significant at the .10 level. |
| 1. Dependent Variable: lnpk. |
| 3. Adjustment for multiple comparisons: Least Significant Difference (equivalent to no adjustments). |

|  |  |  |  |
| --- | --- | --- | --- |
| **Univariate Tests1** | | | |
| **Numerator df** | **Denominator df** | **F** | **Sig.** |
| 1 | 209.440 | 9.786 | .002 |

|  |
| --- |
| The F tests the effect of treatment. This test is based on the linearly independent pairwise comparisons among the estimated marginal means.1 |
| 1. Dependent Variable: lnpk. |

DATASET CLOSE pkdataset.

TITLE "RDS07".

RDS07

GET DATA

/TYPE=XLSX

/FILE='.\rds01.xlsx'

/SHEET=name 'rds07'

/CELLRANGE=FULL

/READNAMES=ON

/LEADINGSPACES IGNORE=YES

/TRAILINGSPACES IGNORE=YES

/DATATYPEMIN PERCENTAGE=95.0

/HIDDEN IGNORE=YES.

EXECUTE.

DATASET NAME pkdataset WINDOW=FRONT.

COMPUTE lnpk=ln(PK).

EXECUTE.

UNIANOVA lnpk BY period sequence treatment subject

/RANDOM subject

/CONTRAST(treatment)=Simple(1)

/METHOD=SSTYPE(3)

/INTERCEPT=INCLUDE

/CRITERIA=ALPHA(0.05)

/DESIGN=period sequence treatment subject(sequence).

Univariate Analysis of Variance

|  |  |  |
| --- | --- | --- |
| **Notes** | | |
| Output Created | | 28-FEB-2021 17:54:35 |
| Comments | |  |
| Input | Active Dataset | pkdataset |
| Filter | <none> |
| Weight | <none> |
| Split File | <none> |
| N of Rows in Working Data File | 1080 |
| Missing Value Handling | Definition of Missing | User-defined missing values are treated as missing. |
| Cases Used | Statistics are based on all cases with valid data for all variables in the model. |
| Syntax | | UNIANOVA lnpk BY period sequence treatment subject  /RANDOM subject  /CONTRAST(treatment)=Simple(1)  /METHOD=SSTYPE(3)  /INTERCEPT=INCLUDE  /CRITERIA=ALPHA(0.05)  /DESIGN=period sequence treatment subject(sequence). |
| Resources | Processor Time | 00:00:01.02 |
| Elapsed Time | 00:00:01.29 |

|  |  |  |
| --- | --- | --- |
| **Between-Subjects Factors** | | |
|  | | **N** |
| period | 1 | 360 |
| 2 | 360 |
| 3 | 360 |
| sequence | RRT | 360 |
| RTR | 360 |
| TRR | 360 |
| treatment | R | 720 |
| T | 360 |
| subject | 1 | 3 |
| 2 | 3 |
| 3 | 3 |
| 4 | 3 |
| 5 | 3 |
| 6 | 3 |
| 7 | 3 |
| 8 | 3 |
| 9 | 3 |
| 10 | 3 |
| 11 | 3 |
| 12 | 3 |
| 13 | 3 |
| 14 | 3 |
| 15 | 3 |
| 16 | 3 |
| 17 | 3 |
| 18 | 3 |
| 19 | 3 |
| 20 | 3 |
| 21 | 3 |
| 22 | 3 |
| 23 | 3 |
| 24 | 3 |
| 25 | 3 |
| 26 | 3 |
| 27 | 3 |
| 28 | 3 |
| 29 | 3 |
| 30 | 3 |
| 31 | 3 |
| 32 | 3 |
| 33 | 3 |
| 34 | 3 |
| 35 | 3 |
| 36 | 3 |
| 37 | 3 |
| 38 | 3 |
| 39 | 3 |
| 40 | 3 |
| 41 | 3 |
| 42 | 3 |
| 43 | 3 |
| 44 | 3 |
| 45 | 3 |
| 46 | 3 |
| 47 | 3 |
| 48 | 3 |
| 49 | 3 |
| 50 | 3 |
| 51 | 3 |
| 52 | 3 |
| 53 | 3 |
| 54 | 3 |
| 55 | 3 |
| 56 | 3 |
| 57 | 3 |
| 58 | 3 |
| 59 | 3 |
| 60 | 3 |
| 61 | 3 |
| 62 | 3 |
| 63 | 3 |
| 64 | 3 |
| 65 | 3 |
| 66 | 3 |
| 67 | 3 |
| 68 | 3 |
| 69 | 3 |
| 70 | 3 |
| 71 | 3 |
| 72 | 3 |
| 73 | 3 |
| 74 | 3 |
| 75 | 3 |
| 76 | 3 |
| 77 | 3 |
| 78 | 3 |
| 79 | 3 |
| 80 | 3 |
| 81 | 3 |
| 82 | 3 |
| 83 | 3 |
| 84 | 3 |
| 85 | 3 |
| 86 | 3 |
| 87 | 3 |
| 88 | 3 |
| 89 | 3 |
| 90 | 3 |
| 91 | 3 |
| 92 | 3 |
| 93 | 3 |
| 94 | 3 |
| 95 | 3 |
| 96 | 3 |
| 97 | 3 |
| 98 | 3 |
| 99 | 3 |
| 100 | 3 |
| 101 | 3 |
| 102 | 3 |
| 103 | 3 |
| 104 | 3 |
| 105 | 3 |
| 106 | 3 |
| 107 | 3 |
| 108 | 3 |
| 109 | 3 |
| 110 | 3 |
| 111 | 3 |
| 112 | 3 |
| 113 | 3 |
| 114 | 3 |
| 115 | 3 |
| 116 | 3 |
| 117 | 3 |
| 118 | 3 |
| 119 | 3 |
| 120 | 3 |
| 121 | 3 |
| 122 | 3 |
| 123 | 3 |
| 124 | 3 |
| 125 | 3 |
| 126 | 3 |
| 127 | 3 |
| 128 | 3 |
| 129 | 3 |
| 130 | 3 |
| 131 | 3 |
| 132 | 3 |
| 133 | 3 |
| 134 | 3 |
| 135 | 3 |
| 136 | 3 |
| 137 | 3 |
| 138 | 3 |
| 139 | 3 |
| 140 | 3 |
| 141 | 3 |
| 142 | 3 |
| 143 | 3 |
| 144 | 3 |
| 145 | 3 |
| 146 | 3 |
| 147 | 3 |
| 148 | 3 |
| 149 | 3 |
| 150 | 3 |
| 151 | 3 |
| 152 | 3 |
| 153 | 3 |
| 154 | 3 |
| 155 | 3 |
| 156 | 3 |
| 157 | 3 |
| 158 | 3 |
| 159 | 3 |
| 160 | 3 |
| 161 | 3 |
| 162 | 3 |
| 163 | 3 |
| 164 | 3 |
| 165 | 3 |
| 166 | 3 |
| 167 | 3 |
| 168 | 3 |
| 169 | 3 |
| 170 | 3 |
| 171 | 3 |
| 172 | 3 |
| 173 | 3 |
| 174 | 3 |
| 175 | 3 |
| 176 | 3 |
| 177 | 3 |
| 178 | 3 |
| 179 | 3 |
| 180 | 3 |
| 181 | 3 |
| 182 | 3 |
| 183 | 3 |
| 184 | 3 |
| 185 | 3 |
| 186 | 3 |
| 187 | 3 |
| 188 | 3 |
| 189 | 3 |
| 190 | 3 |
| 191 | 3 |
| 192 | 3 |
| 193 | 3 |
| 194 | 3 |
| 195 | 3 |
| 196 | 3 |
| 197 | 3 |
| 198 | 3 |
| 199 | 3 |
| 200 | 3 |
| 201 | 3 |
| 202 | 3 |
| 203 | 3 |
| 204 | 3 |
| 205 | 3 |
| 206 | 3 |
| 207 | 3 |
| 208 | 3 |
| 209 | 3 |
| 210 | 3 |
| 211 | 3 |
| 212 | 3 |
| 213 | 3 |
| 214 | 3 |
| 215 | 3 |
| 216 | 3 |
| 217 | 3 |
| 218 | 3 |
| 219 | 3 |
| 220 | 3 |
| 221 | 3 |
| 222 | 3 |
| 223 | 3 |
| 224 | 3 |
| 225 | 3 |
| 226 | 3 |
| 227 | 3 |
| 228 | 3 |
| 229 | 3 |
| 230 | 3 |
| 231 | 3 |
| 232 | 3 |
| 233 | 3 |
| 234 | 3 |
| 235 | 3 |
| 236 | 3 |
| 237 | 3 |
| 238 | 3 |
| 239 | 3 |
| 240 | 3 |
| 241 | 3 |
| 242 | 3 |
| 243 | 3 |
| 244 | 3 |
| 245 | 3 |
| 246 | 3 |
| 247 | 3 |
| 248 | 3 |
| 249 | 3 |
| 250 | 3 |
| 251 | 3 |
| 252 | 3 |
| 253 | 3 |
| 254 | 3 |
| 255 | 3 |
| 256 | 3 |
| 257 | 3 |
| 258 | 3 |
| 259 | 3 |
| 260 | 3 |
| 261 | 3 |
| 262 | 3 |
| 263 | 3 |
| 264 | 3 |
| 265 | 3 |
| 266 | 3 |
| 267 | 3 |
| 268 | 3 |
| 269 | 3 |
| 270 | 3 |
| 271 | 3 |
| 272 | 3 |
| 273 | 3 |
| 274 | 3 |
| 275 | 3 |
| 276 | 3 |
| 277 | 3 |
| 278 | 3 |
| 279 | 3 |
| 280 | 3 |
| 281 | 3 |
| 282 | 3 |
| 283 | 3 |
| 284 | 3 |
| 285 | 3 |
| 286 | 3 |
| 287 | 3 |
| 288 | 3 |
| 289 | 3 |
| 290 | 3 |
| 291 | 3 |
| 292 | 3 |
| 293 | 3 |
| 294 | 3 |
| 295 | 3 |
| 296 | 3 |
| 297 | 3 |
| 298 | 3 |
| 299 | 3 |
| 300 | 3 |
| 301 | 3 |
| 302 | 3 |
| 303 | 3 |
| 304 | 3 |
| 305 | 3 |
| 306 | 3 |
| 307 | 3 |
| 308 | 3 |
| 309 | 3 |
| 310 | 3 |
| 311 | 3 |
| 312 | 3 |
| 313 | 3 |
| 314 | 3 |
| 315 | 3 |
| 316 | 3 |
| 317 | 3 |
| 318 | 3 |
| 319 | 3 |
| 320 | 3 |
| 321 | 3 |
| 322 | 3 |
| 323 | 3 |
| 324 | 3 |
| 325 | 3 |
| 326 | 3 |
| 327 | 3 |
| 328 | 3 |
| 329 | 3 |
| 330 | 3 |
| 331 | 3 |
| 332 | 3 |
| 333 | 3 |
| 334 | 3 |
| 335 | 3 |
| 336 | 3 |
| 337 | 3 |
| 338 | 3 |
| 339 | 3 |
| 340 | 3 |
| 341 | 3 |
| 342 | 3 |
| 343 | 3 |
| 344 | 3 |
| 345 | 3 |
| 346 | 3 |
| 347 | 3 |
| 348 | 3 |
| 349 | 3 |
| 350 | 3 |
| 351 | 3 |
| 352 | 3 |
| 353 | 3 |
| 354 | 3 |
| 355 | 3 |
| 356 | 3 |
| 357 | 3 |
| 358 | 3 |
| 359 | 3 |
| 360 | 3 |

|  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- |
| **Tests of Between-Subjects Effects** | | | | | | |
| Dependent Variable: lnpk | | | | | | |
| Source | | **Type III Sum of Squares** | **df** | **Mean Square** | **F** | **Sig.** |
| Intercept | Hypothesis | 19823.869 | 1 | 19823.869 | 30507.297 | .000 |
| Error | 241.021 | 370.912 | .6501 |  |  |
| period | Hypothesis | .069 | 2 | .034 | .309 | .734 |
| Error | 79.773 | 717 | .1112 |  |  |
| sequence | Hypothesis | 3.494 | 2 | 1.747 | 2.436 | .089 |
| Error | 256.014 | 357 | .7173 |  |  |
| treatment | Hypothesis | 2.908 | 1 | 2.908 | 26.136 | .000 |
| Error | 79.773 | 717 | .1112 |  |  |
| subject(sequence) | Hypothesis | 256.014 | 357 | .717 | 6.446 | .000 |
| Error | 79.773 | 717 | .1112 |  |  |

|  |
| --- |
| 1. .889 MS(subject(sequence)) + .111 MS(Error) |
| 2. MS(Error) |
| 3. MS(subject(sequence)) |

|  |  |  |  |
| --- | --- | --- | --- |
| **Expected Mean Squares1,2** | | | |
| Source | **Variance Component** | | |
| **Var(subject(sequence))** | **Var(Error)** | **Quadratic Term** |
| Intercept | 2.667 | 1.000 | Intercept, period, sequence, treatment |
| period | .000 | 1.000 | period |
| sequence | 3.000 | 1.000 | sequence |
| treatment | .000 | 1.000 | treatment |
| subject(sequence) | 3.000 | 1.000 |  |
| Error | .000 | 1.000 |  |

|  |
| --- |
| 1. For each source, the expected mean square equals the sum of the coefficients in the cells times the variance components, plus a quadratic term involving effects in the Quadratic Term cell. |
| 2. Expected Mean Squares are based on the Type III Sums of Squares. |

Custom Hypothesis Tests

|  |  |  |  |
| --- | --- | --- | --- |
| **Contrast Results (K Matrix)** | | | |
| treatment Simple Contrast1 | | | **Dependent Variable** |
| **lnpk** |
| Level 2 vs. Level 1 | Contrast Estimate | | -.110 |
| Hypothesized Value | | 0 |
| Difference (Estimate - Hypothesized) | | -.110 |
| Std. Error | | .022 |
| Sig. | | .000 |
| 95% Confidence Interval for Difference | Lower Bound | -.152 |
| Upper Bound | -.068 |

|  |
| --- |
| 1. Reference category = 1 |

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| **Test Results** | | | | | |
| Dependent Variable: lnpk | | | | | |
| Source | **Sum of Squares** | **df** | **Mean Square** | **F** | **Sig.** |
| Contrast | 2.908 | 1 | 2.908 | 26.136 | .000 |
| Error | 79.773 | 717 | .111 |  |  |

MIXED lnpk BY period sequence treatment subject

/CRITERIA=DFMETHOD(SATTERTHWAITE) CIN(95) MXITER(100) MXSTEP(10) SCORING(1)

SINGULAR(0.000000000001) HCONVERGE(0, ABSOLUTE) LCONVERGE(0, ABSOLUTE) PCONVERGE(0.000001, ABSOLUTE)

/FIXED=period sequence treatment | SSTYPE(3)

/METHOD=REML

/RANDOM= subject(sequence) | COVTYPE(ID)

/EMMEANS=TABLES(treatment) COMPARE REFCAT(FIRST) ADJ(LSD).

Mixed Model Analysis

|  |  |  |
| --- | --- | --- |
| **Notes** | | |
| Output Created | | 28-FEB-2021 17:54:37 |
| Comments | |  |
| Input | Active Dataset | pkdataset |
| Filter | <none> |
| Weight | <none> |
| Split File | <none> |
| N of Rows in Working Data File | 1080 |
| Missing Value Handling | Definition of Missing | User-defined missing values are treated as missing. |
| Cases Used | Statistics are based on all cases with valid data for all variables in the model. |
| Syntax | | MIXED lnpk BY period sequence treatment subject  /CRITERIA=DFMETHOD(SATTERTHWAITE) CIN(95) MXITER(100) MXSTEP(10) SCORING(1)  SINGULAR(0.000000000001) HCONVERGE(0, ABSOLUTE) LCONVERGE(0, ABSOLUTE) PCONVERGE(0.000001, ABSOLUTE)  /FIXED=period sequence treatment | SSTYPE(3)  /METHOD=REML  /RANDOM= subject(sequence) | COVTYPE(ID)  /EMMEANS=TABLES(treatment) COMPARE REFCAT(FIRST) ADJ(LSD). |
| Resources | Processor Time | 00:00:04.88 |
| Elapsed Time | 00:00:05.15 |

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| **Model Dimension1** | | | | |
|  | | **Number of Levels** | **Covariance Structure** | **Number of Parameters** |
| Fixed Effects | Intercept | 1 |  | 1 |
| period | 3 |  | 2 |
| sequence | 3 |  | 2 |
| treatment | 2 |  | 1 |
| Random Effects | subject(sequence) | 360 | Identity | 1 |
| Residual | |  |  | 1 |
| Total | | 369 |  | 8 |

|  |
| --- |
| 1. Dependent Variable: lnpk. |

|  |  |
| --- | --- |
| **Information Criteria1** | |
| -2 Restricted Log Likelihood | 1388.53679067 |
| Akaike's Information Criterion (AIC) | 1392.53679067 |
| Hurvich and Tsai's Criterion (AICC) | 1392.54799515 |
| Bozdogan's Criterion (CAIC) | 1404.49508122 |
| Schwarz's Bayesian Criterion (BIC) | 1402.49508122 |

|  |
| --- |
| The information criteria are displayed in smaller-is-better form.1 |
| 1. Dependent Variable: lnpk. |

Fixed Effects

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| **Type III Tests of Fixed Effects1** | | | | |
| Source | **Numerator df** | **Denominator df** | **F** | **Sig.** |
| Intercept | 1 | 370.912 | 30507.297 | .000 |
| period | 2 | 717 | .309 | .734 |
| sequence | 2 | 357.000 | 2.436 | .089 |
| treatment | 1 | 717 | 26.136 | .000 |

|  |
| --- |
| 1. Dependent Variable: lnpk. |

Covariance Parameters

|  |  |  |  |
| --- | --- | --- | --- |
| **Estimates of Covariance Parameters1** | | | |
| Parameter | | **Estimate** | **Std. Error** |
| Residual | | .111260 | .005876 |
| subject(sequence) | Variance | .201955 | .017999 |

|  |
| --- |
| 1. Dependent Variable: lnpk. |

Estimated Marginal Means

treatment

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| **Estimates1** | | | | | |
| treatment | **Mean** | **Std. Error** | **df** | **95% Confidence Interval** | |
| **Lower Bound** | **Upper Bound** |
| R | 4.599 | .027 | 413.297 | 4.547 | 4.652 |
| T | 4.489 | .029 | 584.883 | 4.431 | 4.547 |

|  |
| --- |
| 1. Dependent Variable: lnpk. |

|  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- |
| **Pairwise Comparisons1** | | | | | | |
| (I) treatment | (J) treatment | **Mean Difference (I-J)** | **Std. Error** | **df** | **Sig.3** | **95% Confidence Interval for Difference3** |
| **Lower Bound** |
| T | R | -.11007371\* | .02153096 | 717.00000000 | .00000041 | -.15234496 |

|  |  |  |
| --- | --- | --- |
| **Pairwise Comparisons1** | | |
| (I) treatment | (J) treatment | 95% Confidence Interval for Difference |
| **Upper Bound** |
| T | R | -.06780245 |

|  |
| --- |
| Based on estimated marginal means1 |
| \*. The mean difference is significant at the .05 level. |
| 1. Dependent Variable: lnpk. |
| 3. Adjustment for multiple comparisons: Least Significant Difference (equivalent to no adjustments). |

|  |  |  |  |
| --- | --- | --- | --- |
| **Univariate Tests1** | | | |
| **Numerator df** | **Denominator df** | **F** | **Sig.** |
| 1 | 717 | 26.136 | .000 |

|  |
| --- |
| The F tests the effect of treatment. This test is based on the linearly independent pairwise comparisons among the estimated marginal means.1 |
| 1. Dependent Variable: lnpk. |

MIXED lnpk BY period treatment sequence subject

/CRITERIA=CIN(90) MXITER(200) MXSTEP(20) SCORING(2) SINGULAR(0.000000000001) HCONVERGE(0,

RELATIVE) LCONVERGE(0.0000000000001, RELATIVE) PCONVERGE(0, RELATIVE)

/FIXED=period treatment sequence | SSTYPE(3)

/METHOD=REML

/RANDOM=treatment | SUBJECT(subject) COVTYPE(CSH)

/REPEATED=treatment | SUBJECT(subject\*period) COVTYPE(DIAG)

/EMMEANS=TABLES(treatment) COMPARE REFCAT(FIRST) ADJ(LSD).

Mixed Model Analysis

|  |  |  |
| --- | --- | --- |
| **Notes** | | |
| Output Created | | 28-FEB-2021 17:54:42 |
| Comments | |  |
| Input | Active Dataset | pkdataset |
| Filter | <none> |
| Weight | <none> |
| Split File | <none> |
| N of Rows in Working Data File | 1080 |
| Missing Value Handling | Definition of Missing | User-defined missing values are treated as missing. |
| Cases Used | Statistics are based on all cases with valid data for all variables in the model. |
| Syntax | | MIXED lnpk BY period treatment sequence subject  /CRITERIA=CIN(90) MXITER(200) MXSTEP(20) SCORING(2) SINGULAR(0.000000000001) HCONVERGE(0,  RELATIVE) LCONVERGE(0.0000000000001, RELATIVE) PCONVERGE(0, RELATIVE)  /FIXED=period treatment sequence | SSTYPE(3)  /METHOD=REML  /RANDOM=treatment | SUBJECT(subject) COVTYPE(CSH)  /REPEATED=treatment | SUBJECT(subject\*period) COVTYPE(DIAG)  /EMMEANS=TABLES(treatment) COMPARE REFCAT(FIRST) ADJ(LSD). |
| Resources | Processor Time | 00:00:00.73 |
| Elapsed Time | 00:00:00.81 |

|  |
| --- |
| **Warnings** |
| Iteration was terminated but convergence has not been achieved. The MIXED procedure continues despite this warning. Subsequent results produced are based on the last iteration. Validity of the model fit is uncertain. |

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| **Model Dimension1** | | | | | |
|  | | **Number of Levels** | **Covariance Structure** | **Number of Parameters** | **Subject Variables** |
| Fixed Effects | Intercept | 1 |  | 1 |  |
| period | 3 |  | 2 |  |
| treatment | 2 |  | 1 |  |
| sequence | 3 |  | 2 |  |
| Random Effects | treatment | 2 | Heterogeneous Compound Symmetry | 3 | subject |
| Repeated Effects | treatment | 2 | Diagonal | 2 | subject \* period |
| Total | | 13 |  | 11 |  |

|  |  |  |
| --- | --- | --- |
| **Model Dimension1** | | |
|  | | **Number of Subjects** |
| Fixed Effects | Intercept |  |
| period |  |
| treatment |  |
| sequence |  |
| Random Effects | treatment |  |
| Repeated Effects | treatment | 1080 |
| Total | |  |

|  |
| --- |
| 1. Dependent Variable: lnpk. |

|  |  |
| --- | --- |
| **Information Criteria1** | |
| -2 Restricted Log Likelihood | 1387.09282701 |
| Akaike's Information Criterion (AIC) | 1397.09282701 |
| Hurvich and Tsai's Criterion (AICC) | 1397.14900678 |
| Bozdogan's Criterion (CAIC) | 1426.98855338 |
| Schwarz's Bayesian Criterion (BIC) | 1421.98855338 |

|  |
| --- |
| The information criteria are displayed in smaller-is-better form.1 |
| 1. Dependent Variable: lnpk. |

Fixed Effects

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| **Type III Tests of Fixed Effects1** | | | | |
| Source | **Numerator df** | **Denominator df** | **F** | **Sig.** |
| Intercept | 1 | 357.003 | 31040.108 | .000 |
| period | 2 | 716.975 | .315 | .730 |
| treatment | 1 | 357.798 | 25.947 | .000 |
| sequence | 2 | 357.713 | 2.491 | .084 |

|  |
| --- |
| 1. Dependent Variable: lnpk. |

Covariance Parameters

|  |  |  |  |
| --- | --- | --- | --- |
| **Estimates of Covariance Parameters1** | | | |
| Parameter | | **Estimate** | **Std. Error** |
| Repeated Measures | Var: [treatment=R] | .110 | .008 |
| Var: [treatment=T] | 5.665E-6 | .026 |
| treatment [subject = subject] | Var: [treatment=R] | .211 | .020 |
| Var: [treatment=T] | .297 | .034 |
| CSH rho | .789 | .045 |

|  |
| --- |
| 1. Dependent Variable: lnpk. |

Estimated Marginal Means

treatment

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| **Estimates1** | | | | | |
| treatment | **Mean** | **Std. Error** | **df** | **90% Confidence Interval** | |
| **Lower Bound** | **Upper Bound** |
| R | 4.599 | .027 | 357.064 | 4.554 | 4.644 |
| T | 4.489 | .029 | 357.124 | 4.442 | 4.537 |

|  |
| --- |
| 1. Dependent Variable: lnpk. |

|  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- |
| **Pairwise Comparisons1** | | | | | | |
| (I) treatment | (J) treatment | **Mean Difference (I-J)** | **Std. Error** | **df** | **Sig.3** | **90% Confidence Interval for Difference3** |
| **Lower Bound** |
| T | R | -.11007371\* | .02160912 | 357.79843342 | .00000057 | -.14570982 |

|  |  |  |
| --- | --- | --- |
| **Pairwise Comparisons1** | | |
| (I) treatment | (J) treatment | 90% Confidence Interval for Difference |
| **Upper Bound** |
| T | R | -.07443759 |

|  |
| --- |
| Based on estimated marginal means1 |
| \*. The mean difference is significant at the .10 level. |
| 1. Dependent Variable: lnpk. |
| 3. Adjustment for multiple comparisons: Least Significant Difference (equivalent to no adjustments). |

|  |  |  |  |
| --- | --- | --- | --- |
| **Univariate Tests1** | | | |
| **Numerator df** | **Denominator df** | **F** | **Sig.** |
| 1 | 357.798 | 25.947 | .000 |

|  |
| --- |
| The F tests the effect of treatment. This test is based on the linearly independent pairwise comparisons among the estimated marginal means.1 |
| 1. Dependent Variable: lnpk. |

DATASET CLOSE pkdataset.

TITLE "RDS08".

RDS08

GET DATA

/TYPE=XLSX

/FILE='.\rds01.xlsx'

/SHEET=name 'rds08'

/CELLRANGE=FULL

/READNAMES=ON

/LEADINGSPACES IGNORE=YES

/TRAILINGSPACES IGNORE=YES

/DATATYPEMIN PERCENTAGE=95.0

/HIDDEN IGNORE=YES.

EXECUTE.

DATASET NAME pkdataset WINDOW=FRONT.

COMPUTE lnpk=ln(PK).

EXECUTE.

UNIANOVA lnpk BY period sequence treatment subject

/RANDOM subject

/CONTRAST(treatment)=Simple(1)

/METHOD=SSTYPE(3)

/INTERCEPT=INCLUDE

/CRITERIA=ALPHA(0.05)

/DESIGN=period sequence treatment subject(sequence).

Univariate Analysis of Variance

|  |  |  |
| --- | --- | --- |
| **Notes** | | |
| Output Created | | 28-FEB-2021 17:54:43 |
| Comments | |  |
| Input | Active Dataset | pkdataset |
| Filter | <none> |
| Weight | <none> |
| Split File | <none> |
| N of Rows in Working Data File | 888 |
| Missing Value Handling | Definition of Missing | User-defined missing values are treated as missing. |
| Cases Used | Statistics are based on all cases with valid data for all variables in the model. |
| Syntax | | UNIANOVA lnpk BY period sequence treatment subject  /RANDOM subject  /CONTRAST(treatment)=Simple(1)  /METHOD=SSTYPE(3)  /INTERCEPT=INCLUDE  /CRITERIA=ALPHA(0.05)  /DESIGN=period sequence treatment subject(sequence). |
| Resources | Processor Time | 00:00:00.31 |
| Elapsed Time | 00:00:00.55 |

|  |  |  |
| --- | --- | --- |
| **Between-Subjects Factors** | | |
|  | | **N** |
| period | 1 | 222 |
| 2 | 222 |
| 3 | 222 |
| 4 | 222 |
| sequence | RTRT | 444 |
| TRTR | 444 |
| treatment | R | 444 |
| T | 444 |
| subject | 1 | 4 |
| 2 | 4 |
| 3 | 4 |
| 4 | 4 |
| 5 | 4 |
| 6 | 4 |
| 7 | 4 |
| 8 | 4 |
| 9 | 4 |
| 10 | 4 |
| 11 | 4 |
| 12 | 4 |
| 13 | 4 |
| 14 | 4 |
| 15 | 4 |
| 16 | 4 |
| 17 | 4 |
| 18 | 4 |
| 19 | 4 |
| 20 | 4 |
| 21 | 4 |
| 22 | 4 |
| 23 | 4 |
| 24 | 4 |
| 25 | 4 |
| 26 | 4 |
| 27 | 4 |
| 28 | 4 |
| 29 | 4 |
| 30 | 4 |
| 31 | 4 |
| 32 | 4 |
| 33 | 4 |
| 34 | 4 |
| 35 | 4 |
| 36 | 4 |
| 37 | 4 |
| 38 | 4 |
| 39 | 4 |
| 40 | 4 |
| 41 | 4 |
| 42 | 4 |
| 43 | 4 |
| 44 | 4 |
| 45 | 4 |
| 46 | 4 |
| 47 | 4 |
| 48 | 4 |
| 49 | 4 |
| 50 | 4 |
| 51 | 4 |
| 52 | 4 |
| 53 | 4 |
| 54 | 4 |
| 55 | 4 |
| 56 | 4 |
| 57 | 4 |
| 58 | 4 |
| 59 | 4 |
| 60 | 4 |
| 61 | 4 |
| 62 | 4 |
| 63 | 4 |
| 64 | 4 |
| 65 | 4 |
| 66 | 4 |
| 67 | 4 |
| 68 | 4 |
| 69 | 4 |
| 70 | 4 |
| 71 | 4 |
| 72 | 4 |
| 73 | 4 |
| 74 | 4 |
| 75 | 4 |
| 76 | 4 |
| 77 | 4 |
| 78 | 4 |
| 79 | 4 |
| 80 | 4 |
| 81 | 4 |
| 82 | 4 |
| 83 | 4 |
| 84 | 4 |
| 85 | 4 |
| 86 | 4 |
| 87 | 4 |
| 88 | 4 |
| 89 | 4 |
| 90 | 4 |
| 91 | 4 |
| 92 | 4 |
| 93 | 4 |
| 94 | 4 |
| 95 | 4 |
| 96 | 4 |
| 97 | 4 |
| 98 | 4 |
| 99 | 4 |
| 100 | 4 |
| 101 | 4 |
| 102 | 4 |
| 103 | 4 |
| 104 | 4 |
| 105 | 4 |
| 106 | 4 |
| 107 | 4 |
| 108 | 4 |
| 109 | 4 |
| 110 | 4 |
| 111 | 4 |
| 112 | 4 |
| 113 | 4 |
| 114 | 4 |
| 115 | 4 |
| 116 | 4 |
| 117 | 4 |
| 118 | 4 |
| 119 | 4 |
| 120 | 4 |
| 121 | 4 |
| 122 | 4 |
| 123 | 4 |
| 124 | 4 |
| 125 | 4 |
| 126 | 4 |
| 127 | 4 |
| 128 | 4 |
| 129 | 4 |
| 130 | 4 |
| 131 | 4 |
| 132 | 4 |
| 133 | 4 |
| 134 | 4 |
| 135 | 4 |
| 136 | 4 |
| 137 | 4 |
| 138 | 4 |
| 139 | 4 |
| 140 | 4 |
| 141 | 4 |
| 142 | 4 |
| 143 | 4 |
| 144 | 4 |
| 145 | 4 |
| 146 | 4 |
| 147 | 4 |
| 148 | 4 |
| 149 | 4 |
| 150 | 4 |
| 151 | 4 |
| 152 | 4 |
| 153 | 4 |
| 154 | 4 |
| 155 | 4 |
| 156 | 4 |
| 157 | 4 |
| 158 | 4 |
| 159 | 4 |
| 160 | 4 |
| 161 | 4 |
| 162 | 4 |
| 163 | 4 |
| 164 | 4 |
| 165 | 4 |
| 166 | 4 |
| 167 | 4 |
| 168 | 4 |
| 169 | 4 |
| 170 | 4 |
| 171 | 4 |
| 172 | 4 |
| 173 | 4 |
| 174 | 4 |
| 175 | 4 |
| 176 | 4 |
| 177 | 4 |
| 178 | 4 |
| 179 | 4 |
| 180 | 4 |
| 181 | 4 |
| 182 | 4 |
| 183 | 4 |
| 184 | 4 |
| 185 | 4 |
| 186 | 4 |
| 187 | 4 |
| 188 | 4 |
| 189 | 4 |
| 190 | 4 |
| 191 | 4 |
| 192 | 4 |
| 193 | 4 |
| 194 | 4 |
| 195 | 4 |
| 196 | 4 |
| 197 | 4 |
| 198 | 4 |
| 199 | 4 |
| 200 | 4 |
| 201 | 4 |
| 202 | 4 |
| 203 | 4 |
| 204 | 4 |
| 205 | 4 |
| 206 | 4 |
| 207 | 4 |
| 208 | 4 |
| 209 | 4 |
| 210 | 4 |
| 211 | 4 |
| 212 | 4 |
| 213 | 4 |
| 214 | 4 |
| 215 | 4 |
| 216 | 4 |
| 217 | 4 |
| 218 | 4 |
| 219 | 4 |
| 220 | 4 |
| 221 | 4 |
| 222 | 4 |

|  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- |
| **Tests of Between-Subjects Effects** | | | | | | |
| Dependent Variable: lnpk | | | | | | |
| Source | | **Type III Sum of Squares** | **df** | **Mean Square** | **F** | **Sig.** |
| Intercept | Hypothesis | 17463.793 | 1 | 17463.793 | 3415.435 | .000 |
| Error | 1124.903 | 220 | 5.1131 |  |  |
| period | Hypothesis | 1.429 | 3 | .476 | 1.091 | .352 |
| Error | 289.100 | 662 | .4372 |  |  |
| sequence | Hypothesis | 5.278 | 1 | 5.278 | 1.032 | .311 |
| Error | 1124.903 | 220 | 5.1131 |  |  |
| treatment | Hypothesis | 9.370 | 1 | 9.370 | 21.457 | .000 |
| Error | 289.100 | 662 | .4372 |  |  |
| subject(sequence) | Hypothesis | 1124.903 | 220 | 5.113 | 11.709 | .000 |
| Error | 289.100 | 662 | .4372 |  |  |

|  |
| --- |
| 1. MS(subject(sequence)) |
| 2. MS(Error) |

|  |  |  |  |
| --- | --- | --- | --- |
| **Expected Mean Squares1,2** | | | |
| Source | **Variance Component** | | |
| **Var(subject(sequence))** | **Var(Error)** | **Quadratic Term** |
| Intercept | 4.000 | 1.000 | Intercept, period, sequence, treatment |
| period | .000 | 1.000 | period |
| sequence | 4.000 | 1.000 | sequence |
| treatment | .000 | 1.000 | treatment |
| subject(sequence) | 4.000 | 1.000 |  |
| Error | .000 | 1.000 |  |

|  |
| --- |
| 1. For each source, the expected mean square equals the sum of the coefficients in the cells times the variance components, plus a quadratic term involving effects in the Quadratic Term cell. |
| 2. Expected Mean Squares are based on the Type III Sums of Squares. |

Custom Hypothesis Tests

|  |  |  |  |
| --- | --- | --- | --- |
| **Contrast Results (K Matrix)** | | | |
| treatment Simple Contrast1 | | | **Dependent Variable** |
| **lnpk** |
| Level 2 vs. Level 1 | Contrast Estimate | | -.205 |
| Hypothesized Value | | 0 |
| Difference (Estimate - Hypothesized) | | -.205 |
| Std. Error | | .044 |
| Sig. | | .000 |
| 95% Confidence Interval for Difference | Lower Bound | -.293 |
| Upper Bound | -.118 |

|  |
| --- |
| 1. Reference category = 1 |

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| **Test Results** | | | | | |
| Dependent Variable: lnpk | | | | | |
| Source | **Sum of Squares** | **df** | **Mean Square** | **F** | **Sig.** |
| Contrast | 9.370 | 1 | 9.370 | 21.457 | .000 |
| Error | 289.100 | 662 | .437 |  |  |

MIXED lnpk BY period sequence treatment subject

/CRITERIA=DFMETHOD(SATTERTHWAITE) CIN(95) MXITER(100) MXSTEP(10) SCORING(1)

SINGULAR(0.000000000001) HCONVERGE(0, ABSOLUTE) LCONVERGE(0, ABSOLUTE) PCONVERGE(0.000001, ABSOLUTE)

/FIXED=period sequence treatment | SSTYPE(3)

/METHOD=REML

/RANDOM= subject(sequence) | COVTYPE(ID)

/EMMEANS=TABLES(treatment) COMPARE REFCAT(FIRST) ADJ(LSD).

Mixed Model Analysis

|  |  |  |
| --- | --- | --- |
| **Notes** | | |
| Output Created | | 28-FEB-2021 17:54:44 |
| Comments | |  |
| Input | Active Dataset | pkdataset |
| Filter | <none> |
| Weight | <none> |
| Split File | <none> |
| N of Rows in Working Data File | 888 |
| Missing Value Handling | Definition of Missing | User-defined missing values are treated as missing. |
| Cases Used | Statistics are based on all cases with valid data for all variables in the model. |
| Syntax | | MIXED lnpk BY period sequence treatment subject  /CRITERIA=DFMETHOD(SATTERTHWAITE) CIN(95) MXITER(100) MXSTEP(10) SCORING(1)  SINGULAR(0.000000000001) HCONVERGE(0, ABSOLUTE) LCONVERGE(0, ABSOLUTE) PCONVERGE(0.000001, ABSOLUTE)  /FIXED=period sequence treatment | SSTYPE(3)  /METHOD=REML  /RANDOM= subject(sequence) | COVTYPE(ID)  /EMMEANS=TABLES(treatment) COMPARE REFCAT(FIRST) ADJ(LSD). |
| Resources | Processor Time | 00:00:01.25 |
| Elapsed Time | 00:00:01.40 |

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| **Model Dimension1** | | | | |
|  | | **Number of Levels** | **Covariance Structure** | **Number of Parameters** |
| Fixed Effects | Intercept | 1 |  | 1 |
| period | 4 |  | 3 |
| sequence | 2 |  | 1 |
| treatment | 2 |  | 1 |
| Random Effects | subject(sequence) | 222 | Identity | 1 |
| Residual | |  |  | 1 |
| Total | | 231 |  | 8 |

|  |
| --- |
| 1. Dependent Variable: lnpk. |

|  |  |
| --- | --- |
| **Information Criteria1** | |
| -2 Restricted Log Likelihood | 2345.96274074 |
| Akaike's Information Criterion (AIC) | 2349.96274074 |
| Hurvich and Tsai's Criterion (AICC) | 2349.97639262 |
| Bozdogan's Criterion (CAIC) | 2361.52712485 |
| Schwarz's Bayesian Criterion (BIC) | 2359.52712485 |

|  |
| --- |
| The information criteria are displayed in smaller-is-better form.1 |
| 1. Dependent Variable: lnpk. |

Fixed Effects

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| **Type III Tests of Fixed Effects1** | | | | |
| Source | **Numerator df** | **Denominator df** | **F** | **Sig.** |
| Intercept | 1 | 220 | 3415.435 | .000 |
| period | 3 | 662 | 1.091 | .352 |
| sequence | 1 | 220 | 1.032 | .311 |
| treatment | 1 | 662 | 21.457 | .000 |

|  |
| --- |
| 1. Dependent Variable: lnpk. |

Covariance Parameters

|  |  |  |  |
| --- | --- | --- | --- |
| **Estimates of Covariance Parameters1** | | | |
| Parameter | | **Estimate** | **Std. Error** |
| Residual | | .436707 | .024004 |
| subject(sequence) | Variance | 1.169123 | .122029 |

|  |
| --- |
| 1. Dependent Variable: lnpk. |

Estimated Marginal Means

treatment

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| **Estimates1** | | | | | |
| treatment | **Mean** | **Std. Error** | **df** | **95% Confidence Interval** | |
| **Lower Bound** | **Upper Bound** |
| R | 4.537 | .079 | 258.557 | 4.382 | 4.693 |
| T | 4.332 | .079 | 258.557 | 4.176 | 4.488 |

|  |
| --- |
| 1. Dependent Variable: lnpk. |

|  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- |
| **Pairwise Comparisons1** | | | | | | |
| (I) treatment | (J) treatment | **Mean Difference (I-J)** | **Std. Error** | **df** | **Sig.3** | **95% Confidence Interval for Difference3** |
| **Lower Bound** |
| T | R | -.20544820\* | .04435254 | 662.00000000 | .00000436 | -.29253682 |

|  |  |  |
| --- | --- | --- |
| **Pairwise Comparisons1** | | |
| (I) treatment | (J) treatment | 95% Confidence Interval for Difference |
| **Upper Bound** |
| T | R | -.11835959 |

|  |
| --- |
| Based on estimated marginal means1 |
| \*. The mean difference is significant at the .05 level. |
| 1. Dependent Variable: lnpk. |
| 3. Adjustment for multiple comparisons: Least Significant Difference (equivalent to no adjustments). |

|  |  |  |  |
| --- | --- | --- | --- |
| **Univariate Tests1** | | | |
| **Numerator df** | **Denominator df** | **F** | **Sig.** |
| 1 | 662 | 21.457 | .000 |

|  |
| --- |
| The F tests the effect of treatment. This test is based on the linearly independent pairwise comparisons among the estimated marginal means.1 |
| 1. Dependent Variable: lnpk. |

MIXED lnpk BY period treatment sequence subject

/CRITERIA=CIN(90) MXITER(200) MXSTEP(20) SCORING(2) SINGULAR(0.000000000001) HCONVERGE(0,

RELATIVE) LCONVERGE(0.0000000000001, RELATIVE) PCONVERGE(0, RELATIVE)

/FIXED=period treatment sequence | SSTYPE(3)

/METHOD=REML

/RANDOM=treatment | SUBJECT(subject) COVTYPE(CSH)

/REPEATED=treatment | SUBJECT(subject\*period) COVTYPE(DIAG)

/EMMEANS=TABLES(treatment) COMPARE REFCAT(FIRST) ADJ(LSD).

Mixed Model Analysis

|  |  |  |
| --- | --- | --- |
| **Notes** | | |
| Output Created | | 28-FEB-2021 17:54:45 |
| Comments | |  |
| Input | Active Dataset | pkdataset |
| Filter | <none> |
| Weight | <none> |
| Split File | <none> |
| N of Rows in Working Data File | 888 |
| Missing Value Handling | Definition of Missing | User-defined missing values are treated as missing. |
| Cases Used | Statistics are based on all cases with valid data for all variables in the model. |
| Syntax | | MIXED lnpk BY period treatment sequence subject  /CRITERIA=CIN(90) MXITER(200) MXSTEP(20) SCORING(2) SINGULAR(0.000000000001) HCONVERGE(0,  RELATIVE) LCONVERGE(0.0000000000001, RELATIVE) PCONVERGE(0, RELATIVE)  /FIXED=period treatment sequence | SSTYPE(3)  /METHOD=REML  /RANDOM=treatment | SUBJECT(subject) COVTYPE(CSH)  /REPEATED=treatment | SUBJECT(subject\*period) COVTYPE(DIAG)  /EMMEANS=TABLES(treatment) COMPARE REFCAT(FIRST) ADJ(LSD). |
| Resources | Processor Time | 00:00:00.22 |
| Elapsed Time | 00:00:00.27 |

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| **Model Dimension1** | | | | | |
|  | | **Number of Levels** | **Covariance Structure** | **Number of Parameters** | **Subject Variables** |
| Fixed Effects | Intercept | 1 |  | 1 |  |
| period | 4 |  | 3 |  |
| treatment | 2 |  | 1 |  |
| sequence | 2 |  | 1 |  |
| Random Effects | treatment | 2 | Heterogeneous Compound Symmetry | 3 | subject |
| Repeated Effects | treatment | 2 | Diagonal | 2 | subject \* period |
| Total | | 13 |  | 11 |  |

|  |  |  |
| --- | --- | --- |
| **Model Dimension1** | | |
|  | | **Number of Subjects** |
| Fixed Effects | Intercept |  |
| period |  |
| treatment |  |
| sequence |  |
| Random Effects | treatment |  |
| Repeated Effects | treatment | 888 |
| Total | |  |

|  |
| --- |
| 1. Dependent Variable: lnpk. |

|  |  |
| --- | --- |
| **Information Criteria1** | |
| -2 Restricted Log Likelihood | 2342.59939800 |
| Akaike's Information Criterion (AIC) | 2352.59939800 |
| Hurvich and Tsai's Criterion (AICC) | 2352.66789115 |
| Bozdogan's Criterion (CAIC) | 2381.51035828 |
| Schwarz's Bayesian Criterion (BIC) | 2376.51035828 |

|  |
| --- |
| The information criteria are displayed in smaller-is-better form.1 |
| 1. Dependent Variable: lnpk. |

Fixed Effects

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| **Type III Tests of Fixed Effects1** | | | | |
| Source | **Numerator df** | **Denominator df** | **F** | **Sig.** |
| Intercept | 1 | 220.000 | 3415.435 | .000 |
| period | 3 | 502.468 | 1.048 | .371 |
| treatment | 1 | 220.000 | 20.641 | .000 |
| sequence | 1 | 220.000 | 1.032 | .311 |

|  |
| --- |
| 1. Dependent Variable: lnpk. |

Covariance Parameters

|  |  |  |  |
| --- | --- | --- | --- |
| **Estimates of Covariance Parameters1** | | | |
| Parameter | | **Estimate** | **Std. Error** |
| Repeated Measures | Var: [treatment=R] | .470 | .045 |
| Var: [treatment=T] | .386 | .037 |
| treatment [subject = subject] | Var: [treatment=R] | 1.207 | .139 |
| Var: [treatment=T] | 1.148 | .129 |
| CSH rho | .989 | .022 |

|  |
| --- |
| 1. Dependent Variable: lnpk. |

Estimated Marginal Means

treatment

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| **Estimates1** | | | | | |
| treatment | **Mean** | **Std. Error** | **df** | **90% Confidence Interval** | |
| **Lower Bound** | **Upper Bound** |
| R | 4.537 | .081 | 220.000 | 4.404 | 4.671 |
| T | 4.332 | .078 | 220.000 | 4.204 | 4.460 |

|  |
| --- |
| 1. Dependent Variable: lnpk. |

|  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- |
| **Pairwise Comparisons1** | | | | | | |
| (I) treatment | (J) treatment | **Mean Difference (I-J)** | **Std. Error** | **df** | **Sig.3** | **90% Confidence Interval for Difference3** |
| **Lower Bound** |
| T | R | -.20544820\* | .04522037 | 220.00000135 | .00000913 | -.28014363 |

|  |  |  |
| --- | --- | --- |
| **Pairwise Comparisons1** | | |
| (I) treatment | (J) treatment | 90% Confidence Interval for Difference |
| **Upper Bound** |
| T | R | -.13075278 |

|  |
| --- |
| Based on estimated marginal means1 |
| \*. The mean difference is significant at the .10 level. |
| 1. Dependent Variable: lnpk. |
| 3. Adjustment for multiple comparisons: Least Significant Difference (equivalent to no adjustments). |

|  |  |  |  |
| --- | --- | --- | --- |
| **Univariate Tests1** | | | |
| **Numerator df** | **Denominator df** | **F** | **Sig.** |
| 1 | 220.000 | 20.641 | .000 |

|  |
| --- |
| The F tests the effect of treatment. This test is based on the linearly independent pairwise comparisons among the estimated marginal means.1 |
| 1. Dependent Variable: lnpk. |

DATASET CLOSE pkdataset.

TITLE "RDS09".

RDS09

GET DATA

/TYPE=XLSX

/FILE='.\rds01.xlsx'

/SHEET=name 'rds09'

/CELLRANGE=FULL

/READNAMES=ON

/LEADINGSPACES IGNORE=YES

/TRAILINGSPACES IGNORE=YES

/DATATYPEMIN PERCENTAGE=95.0

/HIDDEN IGNORE=YES.

EXECUTE.

DATASET NAME pkdataset WINDOW=FRONT.

COMPUTE lnpk=ln(PK).

EXECUTE.

UNIANOVA lnpk BY period sequence treatment subject

/RANDOM subject

/CONTRAST(treatment)=Simple(1)

/METHOD=SSTYPE(3)

/INTERCEPT=INCLUDE

/CRITERIA=ALPHA(0.05)

/DESIGN=period sequence treatment subject(sequence).

Univariate Analysis of Variance

|  |  |  |
| --- | --- | --- |
| **Notes** | | |
| Output Created | | 28-FEB-2021 17:54:46 |
| Comments | |  |
| Input | Active Dataset | pkdataset |
| Filter | <none> |
| Weight | <none> |
| Split File | <none> |
| N of Rows in Working Data File | 888 |
| Missing Value Handling | Definition of Missing | User-defined missing values are treated as missing. |
| Cases Used | Statistics are based on all cases with valid data for all variables in the model. |
| Syntax | | UNIANOVA lnpk BY period sequence treatment subject  /RANDOM subject  /CONTRAST(treatment)=Simple(1)  /METHOD=SSTYPE(3)  /INTERCEPT=INCLUDE  /CRITERIA=ALPHA(0.05)  /DESIGN=period sequence treatment subject(sequence). |
| Resources | Processor Time | 00:00:00.41 |
| Elapsed Time | 00:00:00.63 |

|  |  |  |
| --- | --- | --- |
| **Between-Subjects Factors** | | |
|  | | **N** |
| period | 1 | 222 |
| 2 | 222 |
| 3 | 222 |
| 4 | 222 |
| sequence | RTRT | 444 |
| TRTR | 444 |
| treatment | R | 444 |
| T | 444 |
| subject | 1 | 4 |
| 2 | 4 |
| 3 | 4 |
| 4 | 4 |
| 5 | 4 |
| 6 | 4 |
| 7 | 4 |
| 8 | 4 |
| 9 | 4 |
| 10 | 4 |
| 11 | 4 |
| 12 | 4 |
| 13 | 4 |
| 14 | 4 |
| 15 | 4 |
| 16 | 4 |
| 17 | 4 |
| 18 | 4 |
| 19 | 4 |
| 20 | 4 |
| 21 | 4 |
| 22 | 4 |
| 23 | 4 |
| 24 | 4 |
| 25 | 4 |
| 26 | 4 |
| 27 | 4 |
| 28 | 4 |
| 29 | 4 |
| 30 | 4 |
| 31 | 4 |
| 32 | 4 |
| 33 | 4 |
| 34 | 4 |
| 35 | 4 |
| 36 | 4 |
| 37 | 4 |
| 38 | 4 |
| 39 | 4 |
| 40 | 4 |
| 41 | 4 |
| 42 | 4 |
| 43 | 4 |
| 44 | 4 |
| 45 | 4 |
| 46 | 4 |
| 47 | 4 |
| 48 | 4 |
| 49 | 4 |
| 50 | 4 |
| 51 | 4 |
| 52 | 4 |
| 53 | 4 |
| 54 | 4 |
| 55 | 4 |
| 56 | 4 |
| 57 | 4 |
| 58 | 4 |
| 59 | 4 |
| 60 | 4 |
| 61 | 4 |
| 62 | 4 |
| 63 | 4 |
| 64 | 4 |
| 65 | 4 |
| 66 | 4 |
| 67 | 4 |
| 68 | 4 |
| 69 | 4 |
| 70 | 4 |
| 71 | 4 |
| 72 | 4 |
| 73 | 4 |
| 74 | 4 |
| 75 | 4 |
| 76 | 4 |
| 77 | 4 |
| 78 | 4 |
| 79 | 4 |
| 80 | 4 |
| 81 | 4 |
| 82 | 4 |
| 83 | 4 |
| 84 | 4 |
| 85 | 4 |
| 86 | 4 |
| 87 | 4 |
| 88 | 4 |
| 89 | 4 |
| 90 | 4 |
| 91 | 4 |
| 92 | 4 |
| 93 | 4 |
| 94 | 4 |
| 95 | 4 |
| 96 | 4 |
| 97 | 4 |
| 98 | 4 |
| 99 | 4 |
| 100 | 4 |
| 101 | 4 |
| 102 | 4 |
| 103 | 4 |
| 104 | 4 |
| 105 | 4 |
| 106 | 4 |
| 107 | 4 |
| 108 | 4 |
| 109 | 4 |
| 110 | 4 |
| 111 | 4 |
| 112 | 4 |
| 113 | 4 |
| 114 | 4 |
| 115 | 4 |
| 116 | 4 |
| 117 | 4 |
| 118 | 4 |
| 119 | 4 |
| 120 | 4 |
| 121 | 4 |
| 122 | 4 |
| 123 | 4 |
| 124 | 4 |
| 125 | 4 |
| 126 | 4 |
| 127 | 4 |
| 128 | 4 |
| 129 | 4 |
| 130 | 4 |
| 131 | 4 |
| 132 | 4 |
| 133 | 4 |
| 134 | 4 |
| 135 | 4 |
| 136 | 4 |
| 137 | 4 |
| 138 | 4 |
| 139 | 4 |
| 140 | 4 |
| 141 | 4 |
| 142 | 4 |
| 143 | 4 |
| 144 | 4 |
| 145 | 4 |
| 146 | 4 |
| 147 | 4 |
| 148 | 4 |
| 149 | 4 |
| 150 | 4 |
| 151 | 4 |
| 152 | 4 |
| 153 | 4 |
| 154 | 4 |
| 155 | 4 |
| 156 | 4 |
| 157 | 4 |
| 158 | 4 |
| 159 | 4 |
| 160 | 4 |
| 161 | 4 |
| 162 | 4 |
| 163 | 4 |
| 164 | 4 |
| 165 | 4 |
| 166 | 4 |
| 167 | 4 |
| 168 | 4 |
| 169 | 4 |
| 170 | 4 |
| 171 | 4 |
| 172 | 4 |
| 173 | 4 |
| 174 | 4 |
| 175 | 4 |
| 176 | 4 |
| 177 | 4 |
| 178 | 4 |
| 179 | 4 |
| 180 | 4 |
| 181 | 4 |
| 182 | 4 |
| 183 | 4 |
| 184 | 4 |
| 185 | 4 |
| 186 | 4 |
| 187 | 4 |
| 188 | 4 |
| 189 | 4 |
| 190 | 4 |
| 191 | 4 |
| 192 | 4 |
| 193 | 4 |
| 194 | 4 |
| 195 | 4 |
| 196 | 4 |
| 197 | 4 |
| 198 | 4 |
| 199 | 4 |
| 200 | 4 |
| 201 | 4 |
| 202 | 4 |
| 203 | 4 |
| 204 | 4 |
| 205 | 4 |
| 206 | 4 |
| 207 | 4 |
| 208 | 4 |
| 209 | 4 |
| 210 | 4 |
| 211 | 4 |
| 212 | 4 |
| 213 | 4 |
| 214 | 4 |
| 215 | 4 |
| 216 | 4 |
| 217 | 4 |
| 218 | 4 |
| 219 | 4 |
| 220 | 4 |
| 221 | 4 |
| 222 | 4 |

|  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- |
| **Tests of Between-Subjects Effects** | | | | | | |
| Dependent Variable: lnpk | | | | | | |
| Source | | **Type III Sum of Squares** | **df** | **Mean Square** | **F** | **Sig.** |
| Intercept | Hypothesis | 40307.042 | 1 | 40307.042 | 430.286 | .000 |
| Error | 20608.502 | 220 | 93.6751 |  |  |
| period | Hypothesis | 1.429 | 3 | .476 | 1.091 | .352 |
| Error | 289.100 | 662 | .4372 |  |  |
| sequence | Hypothesis | 4398.079 | 1 | 4398.079 | 46.950 | .000 |
| Error | 20608.502 | 220 | 93.6751 |  |  |
| treatment | Hypothesis | 9.370 | 1 | 9.370 | 21.457 | .000 |
| Error | 289.100 | 662 | .4372 |  |  |
| subject(sequence) | Hypothesis | 20608.502 | 220 | 93.675 | 214.503 | .000 |
| Error | 289.100 | 662 | .4372 |  |  |

|  |
| --- |
| 1. MS(subject(sequence)) |
| 2. MS(Error) |

|  |  |  |  |
| --- | --- | --- | --- |
| **Expected Mean Squares1,2** | | | |
| Source | **Variance Component** | | |
| **Var(subject(sequence))** | **Var(Error)** | **Quadratic Term** |
| Intercept | 4.000 | 1.000 | Intercept, period, sequence, treatment |
| period | .000 | 1.000 | period |
| sequence | 4.000 | 1.000 | sequence |
| treatment | .000 | 1.000 | treatment |
| subject(sequence) | 4.000 | 1.000 |  |
| Error | .000 | 1.000 |  |

|  |
| --- |
| 1. For each source, the expected mean square equals the sum of the coefficients in the cells times the variance components, plus a quadratic term involving effects in the Quadratic Term cell. |
| 2. Expected Mean Squares are based on the Type III Sums of Squares. |

Custom Hypothesis Tests

|  |  |  |  |
| --- | --- | --- | --- |
| **Contrast Results (K Matrix)** | | | |
| treatment Simple Contrast1 | | | **Dependent Variable** |
| **lnpk** |
| Level 2 vs. Level 1 | Contrast Estimate | | -.205 |
| Hypothesized Value | | 0 |
| Difference (Estimate - Hypothesized) | | -.205 |
| Std. Error | | .044 |
| Sig. | | .000 |
| 95% Confidence Interval for Difference | Lower Bound | -.293 |
| Upper Bound | -.118 |

|  |
| --- |
| 1. Reference category = 1 |

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| **Test Results** | | | | | |
| Dependent Variable: lnpk | | | | | |
| Source | **Sum of Squares** | **df** | **Mean Square** | **F** | **Sig.** |
| Contrast | 9.370 | 1 | 9.370 | 21.457 | .000 |
| Error | 289.100 | 662 | .437 |  |  |

MIXED lnpk BY period sequence treatment subject

/CRITERIA=DFMETHOD(SATTERTHWAITE) CIN(95) MXITER(100) MXSTEP(10) SCORING(1)

SINGULAR(0.000000000001) HCONVERGE(0, ABSOLUTE) LCONVERGE(0, ABSOLUTE) PCONVERGE(0.000001, ABSOLUTE)

/FIXED=period sequence treatment | SSTYPE(3)

/METHOD=REML

/RANDOM= subject(sequence) | COVTYPE(ID)

/EMMEANS=TABLES(treatment) COMPARE REFCAT(FIRST) ADJ(LSD).

Mixed Model Analysis

|  |  |  |
| --- | --- | --- |
| **Notes** | | |
| Output Created | | 28-FEB-2021 17:54:47 |
| Comments | |  |
| Input | Active Dataset | pkdataset |
| Filter | <none> |
| Weight | <none> |
| Split File | <none> |
| N of Rows in Working Data File | 888 |
| Missing Value Handling | Definition of Missing | User-defined missing values are treated as missing. |
| Cases Used | Statistics are based on all cases with valid data for all variables in the model. |
| Syntax | | MIXED lnpk BY period sequence treatment subject  /CRITERIA=DFMETHOD(SATTERTHWAITE) CIN(95) MXITER(100) MXSTEP(10) SCORING(1)  SINGULAR(0.000000000001) HCONVERGE(0, ABSOLUTE) LCONVERGE(0, ABSOLUTE) PCONVERGE(0.000001, ABSOLUTE)  /FIXED=period sequence treatment | SSTYPE(3)  /METHOD=REML  /RANDOM= subject(sequence) | COVTYPE(ID)  /EMMEANS=TABLES(treatment) COMPARE REFCAT(FIRST) ADJ(LSD). |
| Resources | Processor Time | 00:00:02.28 |
| Elapsed Time | 00:00:02.40 |

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| **Model Dimension1** | | | | |
|  | | **Number of Levels** | **Covariance Structure** | **Number of Parameters** |
| Fixed Effects | Intercept | 1 |  | 1 |
| period | 4 |  | 3 |
| sequence | 2 |  | 1 |
| treatment | 2 |  | 1 |
| Random Effects | subject(sequence) | 222 | Identity | 1 |
| Residual | |  |  | 1 |
| Total | | 231 |  | 8 |

|  |
| --- |
| 1. Dependent Variable: lnpk. |

|  |  |
| --- | --- |
| **Information Criteria1** | |
| -2 Restricted Log Likelihood | 2985.72416979 |
| Akaike's Information Criterion (AIC) | 2989.72416979 |
| Hurvich and Tsai's Criterion (AICC) | 2989.73782167 |
| Bozdogan's Criterion (CAIC) | 3001.28855390 |
| Schwarz's Bayesian Criterion (BIC) | 2999.28855390 |

|  |
| --- |
| The information criteria are displayed in smaller-is-better form.1 |
| 1. Dependent Variable: lnpk. |

Fixed Effects

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| **Type III Tests of Fixed Effects1** | | | | |
| Source | **Numerator df** | **Denominator df** | **F** | **Sig.** |
| Intercept | 1 | 220.000 | 430.286 | .000 |
| period | 3 | 662.000 | 1.091 | .352 |
| sequence | 1 | 220.000 | 46.950 | .000 |
| treatment | 1 | 662.000 | 21.457 | .000 |

|  |
| --- |
| 1. Dependent Variable: lnpk. |

Covariance Parameters

|  |  |  |  |
| --- | --- | --- | --- |
| **Estimates of Covariance Parameters1** | | | |
| Parameter | | **Estimate** | **Std. Error** |
| Residual | | .436707 | .024004 |
| subject(sequence) | Variance | 23.309576 | 2.232898 |

|  |
| --- |
| 1. Dependent Variable: lnpk. |

Estimated Marginal Means

treatment

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| **Estimates1** | | | | | |
| treatment | **Mean** | **Std. Error** | **df** | **95% Confidence Interval** | |
| **Lower Bound** | **Upper Bound** |
| R | 6.840 | .326 | 222.054 | 6.198 | 7.482 |
| T | 6.635 | .326 | 222.054 | 5.993 | 7.276 |

|  |
| --- |
| 1. Dependent Variable: lnpk. |

|  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- |
| **Pairwise Comparisons1** | | | | | | |
| (I) treatment | (J) treatment | **Mean Difference (I-J)** | **Std. Error** | **df** | **Sig.3** | **95% Confidence Interval for Difference3** |
| **Lower Bound** |
| T | R | -.20544820\* | .04435254 | 662.00000000 | .00000436 | -.29253682 |

|  |  |  |
| --- | --- | --- |
| **Pairwise Comparisons1** | | |
| (I) treatment | (J) treatment | 95% Confidence Interval for Difference |
| **Upper Bound** |
| T | R | -.11835959 |

|  |
| --- |
| Based on estimated marginal means1 |
| \*. The mean difference is significant at the .05 level. |
| 1. Dependent Variable: lnpk. |
| 3. Adjustment for multiple comparisons: Least Significant Difference (equivalent to no adjustments). |

|  |  |  |  |
| --- | --- | --- | --- |
| **Univariate Tests1** | | | |
| **Numerator df** | **Denominator df** | **F** | **Sig.** |
| 1 | 662.000 | 21.457 | .000 |

|  |
| --- |
| The F tests the effect of treatment. This test is based on the linearly independent pairwise comparisons among the estimated marginal means.1 |
| 1. Dependent Variable: lnpk. |

MIXED lnpk BY period treatment sequence subject

/CRITERIA=CIN(90) MXITER(200) MXSTEP(20) SCORING(2) SINGULAR(0.000000000001) HCONVERGE(0,

RELATIVE) LCONVERGE(0.0000000000001, RELATIVE) PCONVERGE(0, RELATIVE)

/FIXED=period treatment sequence | SSTYPE(3)

/METHOD=REML

/RANDOM=treatment | SUBJECT(subject) COVTYPE(CSH)

/REPEATED=treatment | SUBJECT(subject\*period) COVTYPE(DIAG)

/EMMEANS=TABLES(treatment) COMPARE REFCAT(FIRST) ADJ(LSD).

Mixed Model Analysis

|  |  |  |
| --- | --- | --- |
| **Notes** | | |
| Output Created | | 28-FEB-2021 17:54:50 |
| Comments | |  |
| Input | Active Dataset | pkdataset |
| Filter | <none> |
| Weight | <none> |
| Split File | <none> |
| N of Rows in Working Data File | 888 |
| Missing Value Handling | Definition of Missing | User-defined missing values are treated as missing. |
| Cases Used | Statistics are based on all cases with valid data for all variables in the model. |
| Syntax | | MIXED lnpk BY period treatment sequence subject  /CRITERIA=CIN(90) MXITER(200) MXSTEP(20) SCORING(2) SINGULAR(0.000000000001) HCONVERGE(0,  RELATIVE) LCONVERGE(0.0000000000001, RELATIVE) PCONVERGE(0, RELATIVE)  /FIXED=period treatment sequence | SSTYPE(3)  /METHOD=REML  /RANDOM=treatment | SUBJECT(subject) COVTYPE(CSH)  /REPEATED=treatment | SUBJECT(subject\*period) COVTYPE(DIAG)  /EMMEANS=TABLES(treatment) COMPARE REFCAT(FIRST) ADJ(LSD). |
| Resources | Processor Time | 00:00:00.22 |
| Elapsed Time | 00:00:00.27 |

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| **Model Dimension1** | | | | | |
|  | | **Number of Levels** | **Covariance Structure** | **Number of Parameters** | **Subject Variables** |
| Fixed Effects | Intercept | 1 |  | 1 |  |
| period | 4 |  | 3 |  |
| treatment | 2 |  | 1 |  |
| sequence | 2 |  | 1 |  |
| Random Effects | treatment | 2 | Heterogeneous Compound Symmetry | 3 | subject |
| Repeated Effects | treatment | 2 | Diagonal | 2 | subject \* period |
| Total | | 13 |  | 11 |  |

|  |  |  |
| --- | --- | --- |
| **Model Dimension1** | | |
|  | | **Number of Subjects** |
| Fixed Effects | Intercept |  |
| period |  |
| treatment |  |
| sequence |  |
| Random Effects | treatment |  |
| Repeated Effects | treatment | 888 |
| Total | |  |

|  |
| --- |
| 1. Dependent Variable: lnpk. |

|  |  |
| --- | --- |
| **Information Criteria1** | |
| -2 Restricted Log Likelihood | 2983.26033032 |
| Akaike's Information Criterion (AIC) | 2993.26033032 |
| Hurvich and Tsai's Criterion (AICC) | 2993.32882347 |
| Bozdogan's Criterion (CAIC) | 3022.17129060 |
| Schwarz's Bayesian Criterion (BIC) | 3017.17129060 |

|  |
| --- |
| The information criteria are displayed in smaller-is-better form.1 |
| 1. Dependent Variable: lnpk. |

Fixed Effects

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| **Type III Tests of Fixed Effects1** | | | | |
| Source | **Numerator df** | **Denominator df** | **F** | **Sig.** |
| Intercept | 1 | 220.000 | 430.286 | .000 |
| period | 3 | 502.468 | 1.048 | .371 |
| treatment | 1 | 220.000 | 20.641 | .000 |
| sequence | 1 | 220.000 | 46.950 | .000 |

|  |
| --- |
| 1. Dependent Variable: lnpk. |

Covariance Parameters

|  |  |  |  |
| --- | --- | --- | --- |
| **Estimates of Covariance Parameters1** | | | |
| Parameter | | **Estimate** | **Std. Error** |
| Repeated Measures | Var: [treatment=R] | .470 | .045 |
| Var: [treatment=T] | .386 | .037 |
| treatment [subject = subject] | Var: [treatment=R] | 23.358 | 2.250 |
| Var: [treatment=T] | 23.279 | 2.238 |
| CSH rho | .999 | .001 |

|  |
| --- |
| 1. Dependent Variable: lnpk. |

Estimated Marginal Means

treatment

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| **Estimates1** | | | | | |
| treatment | **Mean** | **Std. Error** | **df** | **90% Confidence Interval** | |
| **Lower Bound** | **Upper Bound** |
| R | 6.840 | .326 | 220.000 | 6.302 | 7.378 |
| T | 6.635 | .325 | 220.000 | 6.097 | 7.172 |

|  |
| --- |
| 1. Dependent Variable: lnpk. |

|  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- |
| **Pairwise Comparisons1** | | | | | | |
| (I) treatment | (J) treatment | **Mean Difference (I-J)** | **Std. Error** | **df** | **Sig.3** | **90% Confidence Interval for Difference3** |
| **Lower Bound** |
| T | R | -.20544820\* | .04522037 | 220.00002305 | .00000913 | -.28014363 |

|  |  |  |
| --- | --- | --- |
| **Pairwise Comparisons1** | | |
| (I) treatment | (J) treatment | 90% Confidence Interval for Difference |
| **Upper Bound** |
| T | R | -.13075278 |

|  |
| --- |
| Based on estimated marginal means1 |
| \*. The mean difference is significant at the .10 level. |
| 1. Dependent Variable: lnpk. |
| 3. Adjustment for multiple comparisons: Least Significant Difference (equivalent to no adjustments). |

|  |  |  |  |
| --- | --- | --- | --- |
| **Univariate Tests1** | | | |
| **Numerator df** | **Denominator df** | **F** | **Sig.** |
| 1 | 220.000 | 20.641 | .000 |

|  |
| --- |
| The F tests the effect of treatment. This test is based on the linearly independent pairwise comparisons among the estimated marginal means.1 |
| 1. Dependent Variable: lnpk. |

DATASET CLOSE pkdataset.

TITLE "RDS10".

RDS10

GET DATA

/TYPE=XLSX

/FILE='.\rds01.xlsx'

/SHEET=name 'rds10'

/CELLRANGE=FULL

/READNAMES=ON

/LEADINGSPACES IGNORE=YES

/TRAILINGSPACES IGNORE=YES

/DATATYPEMIN PERCENTAGE=95.0

/HIDDEN IGNORE=YES.

EXECUTE.

DATASET NAME pkdataset WINDOW=FRONT.

COMPUTE lnpk=ln(PK).

EXECUTE.

UNIANOVA lnpk BY period sequence treatment subject

/RANDOM subject

/CONTRAST(treatment)=Simple(1)

/METHOD=SSTYPE(3)

/INTERCEPT=INCLUDE

/CRITERIA=ALPHA(0.05)

/DESIGN=period sequence treatment subject(sequence).

Univariate Analysis of Variance

|  |  |  |
| --- | --- | --- |
| **Notes** | | |
| Output Created | | 28-FEB-2021 17:54:50 |
| Comments | |  |
| Input | Active Dataset | pkdataset |
| Filter | <none> |
| Weight | <none> |
| Split File | <none> |
| N of Rows in Working Data File | 54 |
| Missing Value Handling | Definition of Missing | User-defined missing values are treated as missing. |
| Cases Used | Statistics are based on all cases with valid data for all variables in the model. |
| Syntax | | UNIANOVA lnpk BY period sequence treatment subject  /RANDOM subject  /CONTRAST(treatment)=Simple(1)  /METHOD=SSTYPE(3)  /INTERCEPT=INCLUDE  /CRITERIA=ALPHA(0.05)  /DESIGN=period sequence treatment subject(sequence). |
| Resources | Processor Time | 00:00:00.03 |
| Elapsed Time | 00:00:00.02 |

|  |  |  |
| --- | --- | --- |
| **Between-Subjects Factors** | | |
|  | | **N** |
| period | 1 | 18 |
| 2 | 18 |
| 3 | 18 |
| sequence | RTT | 27 |
| TRR | 27 |
| treatment | R | 27 |
| T | 27 |
| subject | 1 | 3 |
| 2 | 3 |
| 3 | 3 |
| 4 | 3 |
| 5 | 3 |
| 6 | 3 |
| 7 | 3 |
| 8 | 3 |
| 9 | 3 |
| 10 | 3 |
| 11 | 3 |
| 12 | 3 |
| 13 | 3 |
| 14 | 3 |
| 15 | 3 |
| 16 | 3 |
| 17 | 3 |
| 18 | 3 |

|  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- |
| **Tests of Between-Subjects Effects** | | | | | | |
| Dependent Variable: lnpk | | | | | | |
| Source | | **Type III Sum of Squares** | **df** | **Mean Square** | **F** | **Sig.** |
| Intercept | Hypothesis | 658.342 | 1 | 658.342 | 3187.394 | .000 |
| Error | 3.305 | 16 | .2071 |  |  |
| period | Hypothesis | .001 | 2 | .000 | .034 | .967 |
| Error | .427 | 33 | .0132 |  |  |
| sequence | Hypothesis | .034 | 1 | .034 | .182 | .675 |
| Error | 3.007 | 16.251 | .1853 |  |  |
| treatment | Hypothesis | .004 | 1 | .004 | .286 | .597 |
| Error | .427 | 33 | .0132 |  |  |
| subject(sequence) | Hypothesis | 3.305 | 16 | .207 | 15.965 | .000 |
| Error | .427 | 33 | .0132 |  |  |

|  |
| --- |
| 1. MS(subject(sequence)) |
| 2. MS(Error) |
| 3. .889 MS(subject(sequence)) + .111 MS(Error) |

|  |  |  |  |
| --- | --- | --- | --- |
| **Expected Mean Squares1,2** | | | |
| Source | **Variance Component** | | |
| **Var(subject(sequence))** | **Var(Error)** | **Quadratic Term** |
| Intercept | 3.000 | 1.000 | Intercept, period, sequence, treatment |
| period | .000 | 1.000 | period |
| sequence | 2.667 | 1.000 | sequence |
| treatment | .000 | 1.000 | treatment |
| subject(sequence) | 3.000 | 1.000 |  |
| Error | .000 | 1.000 |  |

|  |
| --- |
| 1. For each source, the expected mean square equals the sum of the coefficients in the cells times the variance components, plus a quadratic term involving effects in the Quadratic Term cell. |
| 2. Expected Mean Squares are based on the Type III Sums of Squares. |

Custom Hypothesis Tests

|  |  |  |  |
| --- | --- | --- | --- |
| **Contrast Results (K Matrix)** | | | |
| treatment Simple Contrast1 | | | **Dependent Variable** |
| **lnpk** |
| Level 2 vs. Level 1 | Contrast Estimate | | .018 |
| Hypothesized Value | | 0 |
| Difference (Estimate - Hypothesized) | | .018 |
| Std. Error | | .033 |
| Sig. | | .597 |
| 95% Confidence Interval for Difference | Lower Bound | -.049 |
| Upper Bound | .084 |

|  |
| --- |
| 1. Reference category = 1 |

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| **Test Results** | | | | | |
| Dependent Variable: lnpk | | | | | |
| Source | **Sum of Squares** | **df** | **Mean Square** | **F** | **Sig.** |
| Contrast | .004 | 1 | .004 | .286 | .597 |
| Error | .427 | 33 | .013 |  |  |

MIXED lnpk BY period sequence treatment subject

/CRITERIA=DFMETHOD(SATTERTHWAITE) CIN(95) MXITER(100) MXSTEP(10) SCORING(1)

SINGULAR(0.000000000001) HCONVERGE(0, ABSOLUTE) LCONVERGE(0, ABSOLUTE) PCONVERGE(0.000001, ABSOLUTE)

/FIXED=period sequence treatment | SSTYPE(3)

/METHOD=REML

/RANDOM= subject(sequence) | COVTYPE(ID)

/EMMEANS=TABLES(treatment) COMPARE REFCAT(FIRST) ADJ(LSD).

Mixed Model Analysis

|  |  |  |
| --- | --- | --- |
| **Notes** | | |
| Output Created | | 28-FEB-2021 17:54:50 |
| Comments | |  |
| Input | Active Dataset | pkdataset |
| Filter | <none> |
| Weight | <none> |
| Split File | <none> |
| N of Rows in Working Data File | 54 |
| Missing Value Handling | Definition of Missing | User-defined missing values are treated as missing. |
| Cases Used | Statistics are based on all cases with valid data for all variables in the model. |
| Syntax | | MIXED lnpk BY period sequence treatment subject  /CRITERIA=DFMETHOD(SATTERTHWAITE) CIN(95) MXITER(100) MXSTEP(10) SCORING(1)  SINGULAR(0.000000000001) HCONVERGE(0, ABSOLUTE) LCONVERGE(0, ABSOLUTE) PCONVERGE(0.000001, ABSOLUTE)  /FIXED=period sequence treatment | SSTYPE(3)  /METHOD=REML  /RANDOM= subject(sequence) | COVTYPE(ID)  /EMMEANS=TABLES(treatment) COMPARE REFCAT(FIRST) ADJ(LSD). |
| Resources | Processor Time | 00:00:00.00 |
| Elapsed Time | 00:00:00.02 |

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| **Model Dimension1** | | | | |
|  | | **Number of Levels** | **Covariance Structure** | **Number of Parameters** |
| Fixed Effects | Intercept | 1 |  | 1 |
| period | 3 |  | 2 |
| sequence | 2 |  | 1 |
| treatment | 2 |  | 1 |
| Random Effects | subject(sequence) | 18 | Identity | 1 |
| Residual | |  |  | 1 |
| Total | | 26 |  | 7 |

|  |
| --- |
| 1. Dependent Variable: lnpk. |

|  |  |
| --- | --- |
| **Information Criteria1** | |
| -2 Restricted Log Likelihood | -15.89382595 |
| Akaike's Information Criterion (AIC) | -11.89382595 |
| Hurvich and Tsai's Criterion (AICC) | -11.63295639 |
| Bozdogan's Criterion (CAIC) | -6.11018536 |
| Schwarz's Bayesian Criterion (BIC) | -8.11018536 |

|  |
| --- |
| The information criteria are displayed in smaller-is-better form.1 |
| 1. Dependent Variable: lnpk. |

Fixed Effects

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| **Type III Tests of Fixed Effects1** | | | | |
| Source | **Numerator df** | **Denominator df** | **F** | **Sig.** |
| Intercept | 1 | 16 | 3187.394 | .000 |
| period | 2 | 33.000 | .034 | .967 |
| sequence | 1 | 16.251 | .182 | .675 |
| treatment | 1 | 33.000 | .286 | .597 |

|  |
| --- |
| 1. Dependent Variable: lnpk. |

Covariance Parameters

|  |  |  |  |
| --- | --- | --- | --- |
| **Estimates of Covariance Parameters1** | | | |
| Parameter | | **Estimate** | **Std. Error** |
| Residual | | .012937 | .003185 |
| subject(sequence) | Variance | .064536 | .024365 |

|  |
| --- |
| 1. Dependent Variable: lnpk. |

Estimated Marginal Means

treatment

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| **Estimates1** | | | | | |
| treatment | **Mean** | **Std. Error** | **df** | **95% Confidence Interval** | |
| **Lower Bound** | **Upper Bound** |
| R | 3.483 | .064 | 18.290 | 3.349 | 3.617 |
| T | 3.500 | .064 | 18.290 | 3.366 | 3.635 |

|  |
| --- |
| 1. Dependent Variable: lnpk. |

|  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- |
| **Pairwise Comparisons1** | | | | | | |
| (I) treatment | (J) treatment | **Mean Difference (I-J)** | **Std. Error** | **df** | **Sig.2** | **95% Confidence Interval for Difference2** |
| **Lower Bound** |
| T | R | .01755367 | .03283425 | 33.00000000 | .59650029 | -.04924811 |

|  |  |  |
| --- | --- | --- |
| **Pairwise Comparisons1** | | |
| (I) treatment | (J) treatment | 95% Confidence Interval for Difference |
| **Upper Bound** |
| T | R | .08435546 |

|  |
| --- |
| Based on estimated marginal means1 |
| 1. Dependent Variable: lnpk. |
| 2. Adjustment for multiple comparisons: Least Significant Difference (equivalent to no adjustments). |

|  |  |  |  |
| --- | --- | --- | --- |
| **Univariate Tests1** | | | |
| **Numerator df** | **Denominator df** | **F** | **Sig.** |
| 1 | 33.000 | .286 | .597 |

|  |
| --- |
| The F tests the effect of treatment. This test is based on the linearly independent pairwise comparisons among the estimated marginal means.1 |
| 1. Dependent Variable: lnpk. |

MIXED lnpk BY period treatment sequence subject

/CRITERIA=CIN(90) MXITER(200) MXSTEP(20) SCORING(2) SINGULAR(0.000000000001) HCONVERGE(0,

RELATIVE) LCONVERGE(0.0000000000001, RELATIVE) PCONVERGE(0, RELATIVE)

/FIXED=period treatment sequence | SSTYPE(3)

/METHOD=REML

/RANDOM=treatment | SUBJECT(subject) COVTYPE(CSH)

/REPEATED=treatment | SUBJECT(subject\*period) COVTYPE(DIAG)

/EMMEANS=TABLES(treatment) COMPARE REFCAT(FIRST) ADJ(LSD).

Mixed Model Analysis

|  |  |  |
| --- | --- | --- |
| **Notes** | | |
| Output Created | | 28-FEB-2021 17:54:50 |
| Comments | |  |
| Input | Active Dataset | pkdataset |
| Filter | <none> |
| Weight | <none> |
| Split File | <none> |
| N of Rows in Working Data File | 54 |
| Missing Value Handling | Definition of Missing | User-defined missing values are treated as missing. |
| Cases Used | Statistics are based on all cases with valid data for all variables in the model. |
| Syntax | | MIXED lnpk BY period treatment sequence subject  /CRITERIA=CIN(90) MXITER(200) MXSTEP(20) SCORING(2) SINGULAR(0.000000000001) HCONVERGE(0,  RELATIVE) LCONVERGE(0.0000000000001, RELATIVE) PCONVERGE(0, RELATIVE)  /FIXED=period treatment sequence | SSTYPE(3)  /METHOD=REML  /RANDOM=treatment | SUBJECT(subject) COVTYPE(CSH)  /REPEATED=treatment | SUBJECT(subject\*period) COVTYPE(DIAG)  /EMMEANS=TABLES(treatment) COMPARE REFCAT(FIRST) ADJ(LSD). |
| Resources | Processor Time | 00:00:00.05 |
| Elapsed Time | 00:00:00.05 |

|  |
| --- |
| **Warnings** |
| Iteration was terminated but convergence has not been achieved. The MIXED procedure continues despite this warning. Subsequent results produced are based on the last iteration. Validity of the model fit is uncertain. |

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| **Model Dimension1** | | | | | |
|  | | **Number of Levels** | **Covariance Structure** | **Number of Parameters** | **Subject Variables** |
| Fixed Effects | Intercept | 1 |  | 1 |  |
| period | 3 |  | 2 |  |
| treatment | 2 |  | 1 |  |
| sequence | 2 |  | 1 |  |
| Random Effects | treatment | 2 | Heterogeneous Compound Symmetry | 3 | subject |
| Repeated Effects | treatment | 2 | Diagonal | 2 | subject \* period |
| Total | | 12 |  | 10 |  |

|  |  |  |
| --- | --- | --- |
| **Model Dimension1** | | |
|  | | **Number of Subjects** |
| Fixed Effects | Intercept |  |
| period |  |
| treatment |  |
| sequence |  |
| Random Effects | treatment |  |
| Repeated Effects | treatment | 54 |
| Total | |  |

|  |
| --- |
| 1. Dependent Variable: lnpk. |

|  |  |
| --- | --- |
| **Information Criteria1** | |
| -2 Restricted Log Likelihood | -16.41729813 |
| Akaike's Information Criterion (AIC) | -6.41729813 |
| Hurvich and Tsai's Criterion (AICC) | -5.02194929 |
| Bozdogan's Criterion (CAIC) | 8.04180336 |
| Schwarz's Bayesian Criterion (BIC) | 3.04180336 |

|  |
| --- |
| The information criteria are displayed in smaller-is-better form.1 |
| 1. Dependent Variable: lnpk. |

Fixed Effects

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| **Type III Tests of Fixed Effects1** | | | | |
| Source | **Numerator df** | **Denominator df** | **F** | **Sig.** |
| Intercept | 1 | 15.951 | 3175.323 | .000 |
| period | 2 | 28.371 | .056 | .946 |
| treatment | 1 | 16.363 | .270 | .610 |
| sequence | 1 | 16.166 | .181 | .676 |

|  |
| --- |
| 1. Dependent Variable: lnpk. |

Covariance Parameters

|  |  |  |  |
| --- | --- | --- | --- |
| **Estimates of Covariance Parameters1** | | | |
| Parameter | | **Estimate** | **Std. Error** |
| Repeated Measures | Var: [treatment=R] | .010 | .005 |
| Var: [treatment=T] | .015 | .007 |
| treatment [subject = subject] | Var: [treatment=R] | .063 | .025 |
| Var: [treatment=T] | .068 | .028 |
| CSH rho | .984 | .071 |

|  |
| --- |
| 1. Dependent Variable: lnpk. |

Estimated Marginal Means

treatment

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| **Estimates1** | | | | | |
| treatment | **Mean** | **Std. Error** | **df** | **90% Confidence Interval** | |
| **Lower Bound** | **Upper Bound** |
| R | 3.483 | .062 | 16.268 | 3.374 | 3.592 |
| T | 3.500 | .066 | 15.641 | 3.385 | 3.616 |

|  |
| --- |
| 1. Dependent Variable: lnpk. |

|  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- |
| **Pairwise Comparisons1** | | | | | | |
| (I) treatment | (J) treatment | **Mean Difference (I-J)** | **Std. Error** | **df** | **Sig.2** | **90% Confidence Interval for Difference2** |
| **Lower Bound** |
| T | R | .01755367 | .03375478 | 16.36325569 | .61000318 | -.04129810 |

|  |  |  |
| --- | --- | --- |
| **Pairwise Comparisons1** | | |
| (I) treatment | (J) treatment | 90% Confidence Interval for Difference |
| **Upper Bound** |
| T | R | .07640545 |

|  |
| --- |
| Based on estimated marginal means1 |
| 1. Dependent Variable: lnpk. |
| 2. Adjustment for multiple comparisons: Least Significant Difference (equivalent to no adjustments). |

|  |  |  |  |
| --- | --- | --- | --- |
| **Univariate Tests1** | | | |
| **Numerator df** | **Denominator df** | **F** | **Sig.** |
| 1 | 16.363 | .270 | .610 |

|  |
| --- |
| The F tests the effect of treatment. This test is based on the linearly independent pairwise comparisons among the estimated marginal means.1 |
| 1. Dependent Variable: lnpk. |

DATASET CLOSE pkdataset.

TITLE "RDS11".

RDS11

GET DATA

/TYPE=XLSX

/FILE='.\rds01.xlsx'

/SHEET=name 'rds11'

/CELLRANGE=FULL

/READNAMES=ON

/LEADINGSPACES IGNORE=YES

/TRAILINGSPACES IGNORE=YES

/DATATYPEMIN PERCENTAGE=95.0

/HIDDEN IGNORE=YES.

EXECUTE.

DATASET NAME pkdataset WINDOW=FRONT.

COMPUTE lnpk=ln(PK).

EXECUTE.

UNIANOVA lnpk BY period sequence treatment subject

/RANDOM subject

/CONTRAST(treatment)=Simple(1)

/METHOD=SSTYPE(3)

/INTERCEPT=INCLUDE

/CRITERIA=ALPHA(0.05)

/DESIGN=period sequence treatment subject(sequence).

Univariate Analysis of Variance

|  |  |  |
| --- | --- | --- |
| **Notes** | | |
| Output Created | | 28-FEB-2021 17:54:52 |
| Comments | |  |
| Input | Active Dataset | pkdataset |
| Filter | <none> |
| Weight | <none> |
| Split File | <none> |
| N of Rows in Working Data File | 148 |
| Missing Value Handling | Definition of Missing | User-defined missing values are treated as missing. |
| Cases Used | Statistics are based on all cases with valid data for all variables in the model. |
| Syntax | | UNIANOVA lnpk BY period sequence treatment subject  /RANDOM subject  /CONTRAST(treatment)=Simple(1)  /METHOD=SSTYPE(3)  /INTERCEPT=INCLUDE  /CRITERIA=ALPHA(0.05)  /DESIGN=period sequence treatment subject(sequence). |
| Resources | Processor Time | 00:00:00.02 |
| Elapsed Time | 00:00:00.06 |

|  |  |  |
| --- | --- | --- |
| **Between-Subjects Factors** | | |
|  | | **N** |
| period | 1 | 37 |
| 2 | 37 |
| 3 | 37 |
| 4 | 37 |
| sequence | RTTR | 76 |
| TRRT | 72 |
| treatment | R | 74 |
| T | 74 |
| subject | 1 | 4 |
| 2 | 4 |
| 3 | 4 |
| 4 | 4 |
| 5 | 4 |
| 6 | 4 |
| 7 | 4 |
| 8 | 4 |
| 9 | 4 |
| 10 | 4 |
| 11 | 4 |
| 12 | 4 |
| 13 | 4 |
| 14 | 4 |
| 15 | 4 |
| 16 | 4 |
| 17 | 4 |
| 18 | 4 |
| 19 | 4 |
| 20 | 4 |
| 21 | 4 |
| 22 | 4 |
| 23 | 4 |
| 24 | 4 |
| 25 | 4 |
| 26 | 4 |
| 27 | 4 |
| 28 | 4 |
| 29 | 4 |
| 30 | 4 |
| 31 | 4 |
| 32 | 4 |
| 33 | 4 |
| 34 | 4 |
| 35 | 4 |
| 36 | 4 |
| 37 | 4 |

|  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- |
| **Tests of Between-Subjects Effects** | | | | | | |
| Dependent Variable: lnpk | | | | | | |
| Source | | **Type III Sum of Squares** | **df** | **Mean Square** | **F** | **Sig.** |
| Intercept | Hypothesis | 4517.323 | 1 | 4517.323 | 2288.755 | .000 |
| Error | 69.080 | 35 | 1.9741 |  |  |
| period | Hypothesis | .911 | 3 | .304 | 1.885 | .137 |
| Error | 17.232 | 107 | .1612 |  |  |
| sequence | Hypothesis | 3.225 | 1 | 3.225 | 1.634 | .210 |
| Error | 69.080 | 35 | 1.9741 |  |  |
| treatment | Hypothesis | .413 | 1 | .413 | 2.566 | .112 |
| Error | 17.232 | 107 | .1612 |  |  |
| subject(sequence) | Hypothesis | 69.080 | 35 | 1.974 | 12.255 | .000 |
| Error | 17.232 | 107 | .1612 |  |  |

|  |
| --- |
| 1. MS(subject(sequence)) |
| 2. MS(Error) |

|  |  |  |  |
| --- | --- | --- | --- |
| **Expected Mean Squares1,2** | | | |
| Source | **Variance Component** | | |
| **Var(subject(sequence))** | **Var(Error)** | **Quadratic Term** |
| Intercept | 4.000 | 1.000 | Intercept, period, sequence, treatment |
| period | .000 | 1.000 | period |
| sequence | 4.000 | 1.000 | sequence |
| treatment | .000 | 1.000 | treatment |
| subject(sequence) | 4.000 | 1.000 |  |
| Error | .000 | 1.000 |  |

|  |
| --- |
| 1. For each source, the expected mean square equals the sum of the coefficients in the cells times the variance components, plus a quadratic term involving effects in the Quadratic Term cell. |
| 2. Expected Mean Squares are based on the Type III Sums of Squares. |

Custom Hypothesis Tests

|  |  |  |  |
| --- | --- | --- | --- |
| **Contrast Results (K Matrix)** | | | |
| treatment Simple Contrast1 | | | **Dependent Variable** |
| **lnpk** |
| Level 2 vs. Level 1 | Contrast Estimate | | -.106 |
| Hypothesized Value | | 0 |
| Difference (Estimate - Hypothesized) | | -.106 |
| Std. Error | | .066 |
| Sig. | | .112 |
| 95% Confidence Interval for Difference | Lower Bound | -.237 |
| Upper Bound | .025 |

|  |
| --- |
| 1. Reference category = 1 |

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| **Test Results** | | | | | |
| Dependent Variable: lnpk | | | | | |
| Source | **Sum of Squares** | **df** | **Mean Square** | **F** | **Sig.** |
| Contrast | .413 | 1 | .413 | 2.566 | .112 |
| Error | 17.232 | 107 | .161 |  |  |

MIXED lnpk BY period sequence treatment subject

/CRITERIA=DFMETHOD(SATTERTHWAITE) CIN(95) MXITER(100) MXSTEP(10) SCORING(1)

SINGULAR(0.000000000001) HCONVERGE(0, ABSOLUTE) LCONVERGE(0, ABSOLUTE) PCONVERGE(0.000001, ABSOLUTE)

/FIXED=period sequence treatment | SSTYPE(3)

/METHOD=REML

/RANDOM= subject(sequence) | COVTYPE(ID)

/EMMEANS=TABLES(treatment) COMPARE REFCAT(FIRST) ADJ(LSD).

Mixed Model Analysis

|  |  |  |
| --- | --- | --- |
| **Notes** | | |
| Output Created | | 28-FEB-2021 17:54:52 |
| Comments | |  |
| Input | Active Dataset | pkdataset |
| Filter | <none> |
| Weight | <none> |
| Split File | <none> |
| N of Rows in Working Data File | 148 |
| Missing Value Handling | Definition of Missing | User-defined missing values are treated as missing. |
| Cases Used | Statistics are based on all cases with valid data for all variables in the model. |
| Syntax | | MIXED lnpk BY period sequence treatment subject  /CRITERIA=DFMETHOD(SATTERTHWAITE) CIN(95) MXITER(100) MXSTEP(10) SCORING(1)  SINGULAR(0.000000000001) HCONVERGE(0, ABSOLUTE) LCONVERGE(0, ABSOLUTE) PCONVERGE(0.000001, ABSOLUTE)  /FIXED=period sequence treatment | SSTYPE(3)  /METHOD=REML  /RANDOM= subject(sequence) | COVTYPE(ID)  /EMMEANS=TABLES(treatment) COMPARE REFCAT(FIRST) ADJ(LSD). |
| Resources | Processor Time | 00:00:00.03 |
| Elapsed Time | 00:00:00.05 |

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| **Model Dimension1** | | | | |
|  | | **Number of Levels** | **Covariance Structure** | **Number of Parameters** |
| Fixed Effects | Intercept | 1 |  | 1 |
| period | 4 |  | 3 |
| sequence | 2 |  | 1 |
| treatment | 2 |  | 1 |
| Random Effects | subject(sequence) | 37 | Identity | 1 |
| Residual | |  |  | 1 |
| Total | | 46 |  | 8 |

|  |
| --- |
| 1. Dependent Variable: lnpk. |

|  |  |
| --- | --- |
| **Information Criteria1** | |
| -2 Restricted Log Likelihood | 253.05107869 |
| Akaike's Information Criterion (AIC) | 257.05107869 |
| Hurvich and Tsai's Criterion (AICC) | 257.13740963 |
| Bozdogan's Criterion (CAIC) | 264.96273281 |
| Schwarz's Bayesian Criterion (BIC) | 262.96273281 |

|  |
| --- |
| The information criteria are displayed in smaller-is-better form.1 |
| 1. Dependent Variable: lnpk. |

Fixed Effects

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| **Type III Tests of Fixed Effects1** | | | | |
| Source | **Numerator df** | **Denominator df** | **F** | **Sig.** |
| Intercept | 1 | 35.000 | 2288.418 | .000 |
| period | 3 | 107.000 | 1.885 | .137 |
| sequence | 1 | 35.000 | 1.634 | .210 |
| treatment | 1 | 107.000 | 2.566 | .112 |

|  |
| --- |
| 1. Dependent Variable: lnpk. |

Covariance Parameters

|  |  |  |  |
| --- | --- | --- | --- |
| **Estimates of Covariance Parameters1** | | | |
| Parameter | | **Estimate** | **Std. Error** |
| Residual | | .161047 | .022018 |
| subject(sequence) | Variance | .453164 | .118080 |

|  |
| --- |
| 1. Dependent Variable: lnpk. |

Estimated Marginal Means

treatment

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| **Estimates1** | | | | | |
| treatment | **Mean** | **Std. Error** | **df** | **95% Confidence Interval** | |
| **Lower Bound** | **Upper Bound** |
| R | 5.579 | .120 | 40.856 | 5.337 | 5.822 |
| T | 5.473 | .120 | 40.856 | 5.231 | 5.716 |

|  |
| --- |
| 1. Dependent Variable: lnpk. |

|  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- |
| **Pairwise Comparisons1** | | | | | | |
| (I) treatment | (J) treatment | **Mean Difference (I-J)** | **Std. Error** | **df** | **Sig.2** | **95% Confidence Interval for Difference2** |
| **Lower Bound** |
| T | R | -.10571213 | .06599848 | 107.00000000 | .11216228 | -.23654642 |

|  |  |  |
| --- | --- | --- |
| **Pairwise Comparisons1** | | |
| (I) treatment | (J) treatment | 95% Confidence Interval for Difference |
| **Upper Bound** |
| T | R | .02512215 |

|  |
| --- |
| Based on estimated marginal means1 |
| 1. Dependent Variable: lnpk. |
| 2. Adjustment for multiple comparisons: Least Significant Difference (equivalent to no adjustments). |

|  |  |  |  |
| --- | --- | --- | --- |
| **Univariate Tests1** | | | |
| **Numerator df** | **Denominator df** | **F** | **Sig.** |
| 1 | 107.000 | 2.566 | .112 |

|  |
| --- |
| The F tests the effect of treatment. This test is based on the linearly independent pairwise comparisons among the estimated marginal means.1 |
| 1. Dependent Variable: lnpk. |

MIXED lnpk BY period treatment sequence subject

/CRITERIA=CIN(90) MXITER(200) MXSTEP(20) SCORING(2) SINGULAR(0.000000000001) HCONVERGE(0,

RELATIVE) LCONVERGE(0.0000000000001, RELATIVE) PCONVERGE(0, RELATIVE)

/FIXED=period treatment sequence | SSTYPE(3)

/METHOD=REML

/RANDOM=treatment | SUBJECT(subject) COVTYPE(CSH)

/REPEATED=treatment | SUBJECT(subject\*period) COVTYPE(DIAG)

/EMMEANS=TABLES(treatment) COMPARE REFCAT(FIRST) ADJ(LSD).

Mixed Model Analysis

|  |  |  |
| --- | --- | --- |
| **Notes** | | |
| Output Created | | 28-FEB-2021 17:54:52 |
| Comments | |  |
| Input | Active Dataset | pkdataset |
| Filter | <none> |
| Weight | <none> |
| Split File | <none> |
| N of Rows in Working Data File | 148 |
| Missing Value Handling | Definition of Missing | User-defined missing values are treated as missing. |
| Cases Used | Statistics are based on all cases with valid data for all variables in the model. |
| Syntax | | MIXED lnpk BY period treatment sequence subject  /CRITERIA=CIN(90) MXITER(200) MXSTEP(20) SCORING(2) SINGULAR(0.000000000001) HCONVERGE(0,  RELATIVE) LCONVERGE(0.0000000000001, RELATIVE) PCONVERGE(0, RELATIVE)  /FIXED=period treatment sequence | SSTYPE(3)  /METHOD=REML  /RANDOM=treatment | SUBJECT(subject) COVTYPE(CSH)  /REPEATED=treatment | SUBJECT(subject\*period) COVTYPE(DIAG)  /EMMEANS=TABLES(treatment) COMPARE REFCAT(FIRST) ADJ(LSD). |
| Resources | Processor Time | 00:00:00.06 |
| Elapsed Time | 00:00:00.08 |

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| **Model Dimension1** | | | | | |
|  | | **Number of Levels** | **Covariance Structure** | **Number of Parameters** | **Subject Variables** |
| Fixed Effects | Intercept | 1 |  | 1 |  |
| period | 4 |  | 3 |  |
| treatment | 2 |  | 1 |  |
| sequence | 2 |  | 1 |  |
| Random Effects | treatment | 2 | Heterogeneous Compound Symmetry | 3 | subject |
| Repeated Effects | treatment | 2 | Diagonal | 2 | subject \* period |
| Total | | 13 |  | 11 |  |

|  |  |  |
| --- | --- | --- |
| **Model Dimension1** | | |
|  | | **Number of Subjects** |
| Fixed Effects | Intercept |  |
| period |  |
| treatment |  |
| sequence |  |
| Random Effects | treatment |  |
| Repeated Effects | treatment | 148 |
| Total | |  |

|  |
| --- |
| 1. Dependent Variable: lnpk. |

|  |  |
| --- | --- |
| **Information Criteria1** | |
| -2 Restricted Log Likelihood | 250.94514897 |
| Akaike's Information Criterion (AIC) | 260.94514897 |
| Hurvich and Tsai's Criterion (AICC) | 261.38632544 |
| Bozdogan's Criterion (CAIC) | 280.72428426 |
| Schwarz's Bayesian Criterion (BIC) | 275.72428426 |

|  |
| --- |
| The information criteria are displayed in smaller-is-better form.1 |
| 1. Dependent Variable: lnpk. |

Fixed Effects

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| **Type III Tests of Fixed Effects1** | | | | |
| Source | **Numerator df** | **Denominator df** | **F** | **Sig.** |
| Intercept | 1 | 35.000 | 2288.418 | .000 |
| period | 3 | 84.020 | 2.042 | .114 |
| treatment | 1 | 35.000 | 2.107 | .156 |
| sequence | 1 | 35.000 | 1.634 | .210 |

|  |
| --- |
| 1. Dependent Variable: lnpk. |

Covariance Parameters

|  |  |  |  |
| --- | --- | --- | --- |
| **Estimates of Covariance Parameters1** | | | |
| Parameter | | **Estimate** | **Std. Error** |
| Repeated Measures | Var: [treatment=R] | .121 | .028 |
| Var: [treatment=T] | .167 | .039 |
| treatment [subject = subject] | Var: [treatment=R] | .476 | .129 |
| Var: [treatment=T] | .465 | .133 |
| CSH rho | .945 | .056 |

|  |
| --- |
| 1. Dependent Variable: lnpk. |

Estimated Marginal Means

treatment

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| **Estimates1** | | | | | |
| treatment | **Mean** | **Std. Error** | **df** | **90% Confidence Interval** | |
| **Lower Bound** | **Upper Bound** |
| R | 5.579 | .120 | 35.000 | 5.376 | 5.783 |
| T | 5.473 | .122 | 35.000 | 5.268 | 5.679 |

|  |
| --- |
| 1. Dependent Variable: lnpk. |

|  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- |
| **Pairwise Comparisons1** | | | | | | |
| (I) treatment | (J) treatment | **Mean Difference (I-J)** | **Std. Error** | **df** | **Sig.2** | **90% Confidence Interval for Difference2** |
| **Lower Bound** |
| T | R | -.10571213 | .07283064 | 35.00000338 | .15555174 | -.22876477 |

|  |  |  |
| --- | --- | --- |
| **Pairwise Comparisons1** | | |
| (I) treatment | (J) treatment | 90% Confidence Interval for Difference |
| **Upper Bound** |
| T | R | .01734050 |

|  |
| --- |
| Based on estimated marginal means1 |
| 1. Dependent Variable: lnpk. |
| 2. Adjustment for multiple comparisons: Least Significant Difference (equivalent to no adjustments). |

|  |  |  |  |
| --- | --- | --- | --- |
| **Univariate Tests1** | | | |
| **Numerator df** | **Denominator df** | **F** | **Sig.** |
| 1 | 35.000 | 2.107 | .156 |

|  |
| --- |
| The F tests the effect of treatment. This test is based on the linearly independent pairwise comparisons among the estimated marginal means.1 |
| 1. Dependent Variable: lnpk. |

DATASET CLOSE pkdataset.

TITLE "RDS12".

RDS12

GET DATA

/TYPE=XLSX

/FILE='.\rds01.xlsx'

/SHEET=name 'rds12'

/CELLRANGE=FULL

/READNAMES=ON

/LEADINGSPACES IGNORE=YES

/TRAILINGSPACES IGNORE=YES

/DATATYPEMIN PERCENTAGE=95.0

/HIDDEN IGNORE=YES.

EXECUTE.

DATASET NAME pkdataset WINDOW=FRONT.

COMPUTE lnpk=ln(PK).

EXECUTE.

UNIANOVA lnpk BY period sequence treatment subject

/RANDOM subject

/CONTRAST(treatment)=Simple(1)

/METHOD=SSTYPE(3)

/INTERCEPT=INCLUDE

/CRITERIA=ALPHA(0.05)

/DESIGN=period sequence treatment subject(sequence).

Univariate Analysis of Variance

|  |  |  |
| --- | --- | --- |
| **Notes** | | |
| Output Created | | 28-FEB-2021 17:54:53 |
| Comments | |  |
| Input | Active Dataset | pkdataset |
| Filter | <none> |
| Weight | <none> |
| Split File | <none> |
| N of Rows in Working Data File | 298 |
| Missing Value Handling | Definition of Missing | User-defined missing values are treated as missing. |
| Cases Used | Statistics are based on all cases with valid data for all variables in the model. |
| Syntax | | UNIANOVA lnpk BY period sequence treatment subject  /RANDOM subject  /CONTRAST(treatment)=Simple(1)  /METHOD=SSTYPE(3)  /INTERCEPT=INCLUDE  /CRITERIA=ALPHA(0.05)  /DESIGN=period sequence treatment subject(sequence). |
| Resources | Processor Time | 00:00:00.03 |
| Elapsed Time | 00:00:00.03 |

|  |  |  |
| --- | --- | --- |
| **Between-Subjects Factors** | | |
|  | | **N** |
| period | 1 | 77 |
| 2 | 76 |
| 3 | 70 |
| 4 | 75 |
| sequence | RTRT | 149 |
| TRTR | 149 |
| treatment | R | 150 |
| T | 148 |
| subject | 1 | 4 |
| 2 | 4 |
| 3 | 4 |
| 4 | 4 |
| 5 | 4 |
| 6 | 4 |
| 7 | 4 |
| 8 | 4 |
| 9 | 4 |
| 10 | 4 |
| 11 | 3 |
| 12 | 4 |
| 13 | 4 |
| 14 | 4 |
| 15 | 4 |
| 16 | 4 |
| 17 | 4 |
| 18 | 4 |
| 19 | 4 |
| 20 | 3 |
| 21 | 4 |
| 22 | 4 |
| 23 | 4 |
| 24 | 3 |
| 25 | 4 |
| 26 | 4 |
| 27 | 4 |
| 28 | 4 |
| 29 | 4 |
| 30 | 4 |
| 31 | 3 |
| 32 | 4 |
| 33 | 4 |
| 34 | 4 |
| 35 | 4 |
| 36 | 4 |
| 37 | 4 |
| 38 | 4 |
| 39 | 4 |
| 40 | 4 |
| 41 | 4 |
| 42 | 3 |
| 43 | 4 |
| 44 | 4 |
| 45 | 4 |
| 46 | 4 |
| 47 | 4 |
| 48 | 4 |
| 49 | 4 |
| 50 | 4 |
| 51 | 4 |
| 52 | 4 |
| 53 | 4 |
| 54 | 4 |
| 55 | 4 |
| 56 | 4 |
| 57 | 4 |
| 58 | 4 |
| 59 | 4 |
| 60 | 4 |
| 62 | 4 |
| 63 | 4 |
| 64 | 4 |
| 65 | 4 |
| 66 | 4 |
| 67 | 2 |
| 68 | 4 |
| 69 | 3 |
| 70 | 4 |
| 71 | 2 |
| 72 | 4 |
| 73 | 4 |
| 74 | 4 |
| 75 | 4 |
| 76 | 4 |
| 77 | 4 |
| 78 | 4 |

|  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- |
| **Tests of Between-Subjects Effects** | | | | | | |
| Dependent Variable: lnpk | | | | | | |
| Source | | **Type III Sum of Squares** | **df** | **Mean Square** | **F** | **Sig.** |
| Intercept | Hypothesis | 10.253 | 1 | 10.253 | 1.928 | .169 |
| Error | 405.086 | 76.174 | 5.3181 |  |  |
| period | Hypothesis | 202.150 | 3 | 67.383 | 31.737 | .000 |
| Error | 460.733 | 217 | 2.1232 |  |  |
| sequence | Hypothesis | 7.707 | 1 | 7.707 | 1.447 | .233 |
| Error | 404.905 | 76.036 | 5.3253 |  |  |
| treatment | Hypothesis | 2.493 | 1 | 2.493 | 1.174 | .280 |
| Error | 460.733 | 217 | 2.1232 |  |  |
| subject(sequence) | Hypothesis | 403.583 | 75 | 5.381 | 2.534 | .000 |
| Error | 460.733 | 217 | 2.1232 |  |  |

|  |
| --- |
| 1. .981 MS(subject(sequence)) + .019 MS(Error) |
| 2. MS(Error) |
| 3. .983 MS(subject(sequence)) + .017 MS(Error) |

|  |  |  |  |
| --- | --- | --- | --- |
| **Expected Mean Squares1,2** | | | |
| Source | **Variance Component** | | |
| **Var(subject(sequence))** | **Var(Error)** | **Quadratic Term** |
| Intercept | 3.793 | 1.000 | Intercept, period, sequence, treatment |
| period | .000 | 1.000 | period |
| sequence | 3.801 | 1.000 | sequence |
| treatment | .000 | 1.000 | treatment |
| subject(sequence) | 3.868 | 1.000 |  |
| Error | .000 | 1.000 |  |

|  |
| --- |
| 1. For each source, the expected mean square equals the sum of the coefficients in the cells times the variance components, plus a quadratic term involving effects in the Quadratic Term cell. |
| 2. Expected Mean Squares are based on the Type III Sums of Squares. |

Custom Hypothesis Tests

|  |  |  |  |
| --- | --- | --- | --- |
| **Contrast Results (K Matrix)** | | | |
| treatment Simple Contrast1 | | | **Dependent Variable** |
| **lnpk** |
| Level 2 vs. Level 1 | Contrast Estimate | | .184 |
| Hypothesized Value | | 0 |
| Difference (Estimate - Hypothesized) | | .184 |
| Std. Error | | .169 |
| Sig. | | .280 |
| 95% Confidence Interval for Difference | Lower Bound | -.150 |
| Upper Bound | .518 |

|  |
| --- |
| 1. Reference category = 1 |

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| **Test Results** | | | | | |
| Dependent Variable: lnpk | | | | | |
| Source | **Sum of Squares** | **df** | **Mean Square** | **F** | **Sig.** |
| Contrast | 2.493 | 1 | 2.493 | 1.174 | .280 |
| Error | 460.733 | 217 | 2.123 |  |  |

MIXED lnpk BY period sequence treatment subject

/CRITERIA=DFMETHOD(SATTERTHWAITE) CIN(95) MXITER(100) MXSTEP(10) SCORING(1)

SINGULAR(0.000000000001) HCONVERGE(0, ABSOLUTE) LCONVERGE(0, ABSOLUTE) PCONVERGE(0.000001, ABSOLUTE)

/FIXED=period sequence treatment | SSTYPE(3)

/METHOD=REML

/RANDOM= subject(sequence) | COVTYPE(ID)

/EMMEANS=TABLES(treatment) COMPARE REFCAT(FIRST) ADJ(LSD).

Mixed Model Analysis

|  |  |  |
| --- | --- | --- |
| **Notes** | | |
| Output Created | | 28-FEB-2021 17:54:53 |
| Comments | |  |
| Input | Active Dataset | pkdataset |
| Filter | <none> |
| Weight | <none> |
| Split File | <none> |
| N of Rows in Working Data File | 298 |
| Missing Value Handling | Definition of Missing | User-defined missing values are treated as missing. |
| Cases Used | Statistics are based on all cases with valid data for all variables in the model. |
| Syntax | | MIXED lnpk BY period sequence treatment subject  /CRITERIA=DFMETHOD(SATTERTHWAITE) CIN(95) MXITER(100) MXSTEP(10) SCORING(1)  SINGULAR(0.000000000001) HCONVERGE(0, ABSOLUTE) LCONVERGE(0, ABSOLUTE) PCONVERGE(0.000001, ABSOLUTE)  /FIXED=period sequence treatment | SSTYPE(3)  /METHOD=REML  /RANDOM= subject(sequence) | COVTYPE(ID)  /EMMEANS=TABLES(treatment) COMPARE REFCAT(FIRST) ADJ(LSD). |
| Resources | Processor Time | 00:00:00.22 |
| Elapsed Time | 00:00:00.26 |

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| **Model Dimension1** | | | | |
|  | | **Number of Levels** | **Covariance Structure** | **Number of Parameters** |
| Fixed Effects | Intercept | 1 |  | 1 |
| period | 4 |  | 3 |
| sequence | 2 |  | 1 |
| treatment | 2 |  | 1 |
| Random Effects | subject(sequence) | 77 | Identity | 1 |
| Residual | |  |  | 1 |
| Total | | 86 |  | 8 |

|  |
| --- |
| 1. Dependent Variable: lnpk. |

|  |  |
| --- | --- |
| **Information Criteria1** | |
| -2 Restricted Log Likelihood | 1143.36304904 |
| Akaike's Information Criterion (AIC) | 1147.36304904 |
| Hurvich and Tsai's Criterion (AICC) | 1147.40457153 |
| Bozdogan's Criterion (CAIC) | 1156.71655665 |
| Schwarz's Bayesian Criterion (BIC) | 1154.71655665 |

|  |
| --- |
| The information criteria are displayed in smaller-is-better form.1 |
| 1. Dependent Variable: lnpk. |

Fixed Effects

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| **Type III Tests of Fixed Effects1** | | | | |
| Source | **Numerator df** | **Denominator df** | **F** | **Sig.** |
| Intercept | 1 | 75.596 | 1.872 | .175 |
| period | 3 | 219.922 | 32.057 | .000 |
| sequence | 1 | 75.539 | 1.505 | .224 |
| treatment | 1 | 219.173 | 1.104 | .294 |

|  |
| --- |
| 1. Dependent Variable: lnpk. |

Covariance Parameters

|  |  |  |  |
| --- | --- | --- | --- |
| **Estimates of Covariance Parameters1** | | | |
| Parameter | | **Estimate** | **Std. Error** |
| Residual | | 2.118189 | .202892 |
| subject(sequence) | Variance | .842412 | .231983 |

|  |
| --- |
| 1. Dependent Variable: lnpk. |

Estimated Marginal Means

treatment

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| **Estimates1** | | | | | |
| treatment | **Mean** | **Std. Error** | **df** | **95% Confidence Interval** | |
| **Lower Bound** | **Upper Bound** |
| R | -.273 | .159 | 137.819 | -.587 | .041 |
| T | -.095 | .159 | 139.645 | -.410 | .220 |

|  |
| --- |
| 1. Dependent Variable: lnpk. |

|  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- |
| **Pairwise Comparisons1** | | | | | | |
| (I) treatment | (J) treatment | **Mean Difference (I-J)** | **Std. Error** | **df** | **Sig.2** | **95% Confidence Interval for Difference2** |
| **Lower Bound** |
| T | R | .17757179 | .16896558 | 219.17342196 | .29444594 | -.15543347 |

|  |  |  |
| --- | --- | --- |
| **Pairwise Comparisons1** | | |
| (I) treatment | (J) treatment | 95% Confidence Interval for Difference |
| **Upper Bound** |
| T | R | .51057705 |

|  |
| --- |
| Based on estimated marginal means1 |
| 1. Dependent Variable: lnpk. |
| 2. Adjustment for multiple comparisons: Least Significant Difference (equivalent to no adjustments). |

|  |  |  |  |
| --- | --- | --- | --- |
| **Univariate Tests1** | | | |
| **Numerator df** | **Denominator df** | **F** | **Sig.** |
| 1 | 219.173 | 1.104 | .294 |

|  |
| --- |
| The F tests the effect of treatment. This test is based on the linearly independent pairwise comparisons among the estimated marginal means.1 |
| 1. Dependent Variable: lnpk. |

MIXED lnpk BY period treatment sequence subject

/CRITERIA=CIN(90) MXITER(200) MXSTEP(20) SCORING(2) SINGULAR(0.000000000001) HCONVERGE(0,

RELATIVE) LCONVERGE(0.0000000000001, RELATIVE) PCONVERGE(0, RELATIVE)

/FIXED=period treatment sequence | SSTYPE(3)

/METHOD=REML

/RANDOM=treatment | SUBJECT(subject) COVTYPE(CSH)

/REPEATED=treatment | SUBJECT(subject\*period) COVTYPE(DIAG)

/EMMEANS=TABLES(treatment) COMPARE REFCAT(FIRST) ADJ(LSD).

Mixed Model Analysis

|  |  |  |
| --- | --- | --- |
| **Notes** | | |
| Output Created | | 28-FEB-2021 17:54:53 |
| Comments | |  |
| Input | Active Dataset | pkdataset |
| Filter | <none> |
| Weight | <none> |
| Split File | <none> |
| N of Rows in Working Data File | 298 |
| Missing Value Handling | Definition of Missing | User-defined missing values are treated as missing. |
| Cases Used | Statistics are based on all cases with valid data for all variables in the model. |
| Syntax | | MIXED lnpk BY period treatment sequence subject  /CRITERIA=CIN(90) MXITER(200) MXSTEP(20) SCORING(2) SINGULAR(0.000000000001) HCONVERGE(0,  RELATIVE) LCONVERGE(0.0000000000001, RELATIVE) PCONVERGE(0, RELATIVE)  /FIXED=period treatment sequence | SSTYPE(3)  /METHOD=REML  /RANDOM=treatment | SUBJECT(subject) COVTYPE(CSH)  /REPEATED=treatment | SUBJECT(subject\*period) COVTYPE(DIAG)  /EMMEANS=TABLES(treatment) COMPARE REFCAT(FIRST) ADJ(LSD). |
| Resources | Processor Time | 00:00:00.09 |
| Elapsed Time | 00:00:00.14 |

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| **Model Dimension1** | | | | | |
|  | | **Number of Levels** | **Covariance Structure** | **Number of Parameters** | **Subject Variables** |
| Fixed Effects | Intercept | 1 |  | 1 |  |
| period | 4 |  | 3 |  |
| treatment | 2 |  | 1 |  |
| sequence | 2 |  | 1 |  |
| Random Effects | treatment | 2 | Heterogeneous Compound Symmetry | 3 | subject |
| Repeated Effects | treatment | 2 | Diagonal | 2 | subject \* period |
| Total | | 13 |  | 11 |  |

|  |  |  |
| --- | --- | --- |
| **Model Dimension1** | | |
|  | | **Number of Subjects** |
| Fixed Effects | Intercept |  |
| period |  |
| treatment |  |
| sequence |  |
| Random Effects | treatment |  |
| Repeated Effects | treatment | 298 |
| Total | |  |

|  |
| --- |
| 1. Dependent Variable: lnpk. |

|  |  |
| --- | --- |
| **Information Criteria1** | |
| -2 Restricted Log Likelihood | 1140.38166248 |
| Akaike's Information Criterion (AIC) | 1150.38166248 |
| Hurvich and Tsai's Criterion (AICC) | 1150.59145269 |
| Bozdogan's Criterion (CAIC) | 1173.76543149 |
| Schwarz's Bayesian Criterion (BIC) | 1168.76543149 |

|  |
| --- |
| The information criteria are displayed in smaller-is-better form.1 |
| 1. Dependent Variable: lnpk. |

Fixed Effects

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| **Type III Tests of Fixed Effects1** | | | | |
| Source | **Numerator df** | **Denominator df** | **F** | **Sig.** |
| Intercept | 1 | 75.541 | 1.813 | .182 |
| period | 3 | 202.149 | 31.755 | .000 |
| treatment | 1 | 72.447 | 1.010 | .318 |
| sequence | 1 | 75.483 | 1.469 | .229 |

|  |
| --- |
| 1. Dependent Variable: lnpk. |

Covariance Parameters

|  |  |  |  |
| --- | --- | --- | --- |
| **Estimates of Covariance Parameters1** | | | |
| Parameter | | **Estimate** | **Std. Error** |
| Repeated Measures | Var: [treatment=R] | 1.831 | .312 |
| Var: [treatment=T] | 2.275 | .385 |
| treatment [subject = subject] | Var: [treatment=R] | 1.307 | .399 |
| Var: [treatment=T] | .506 | .332 |
| CSH rho | .992 | .319 |

|  |
| --- |
| 1. Dependent Variable: lnpk. |

Estimated Marginal Means

treatment

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| **Estimates1** | | | | | |
| treatment | **Mean** | **Std. Error** | **df** | **90% Confidence Interval** | |
| **Lower Bound** | **Upper Bound** |
| R | -.269 | .171 | 75.143 | -.554 | .017 |
| T | -.094 | .148 | 76.001 | -.341 | .153 |

|  |
| --- |
| 1. Dependent Variable: lnpk. |

|  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- |
| **Pairwise Comparisons1** | | | | | | |
| (I) treatment | (J) treatment | **Mean Difference (I-J)** | **Std. Error** | **df** | **Sig.2** | **90% Confidence Interval for Difference2** |
| **Lower Bound** |
| T | R | .17482459 | .17399618 | 72.44690118 | .31835611 | -.11508084 |

|  |  |  |
| --- | --- | --- |
| **Pairwise Comparisons1** | | |
| (I) treatment | (J) treatment | 90% Confidence Interval for Difference |
| **Upper Bound** |
| T | R | .46473003 |

|  |
| --- |
| Based on estimated marginal means1 |
| 1. Dependent Variable: lnpk. |
| 2. Adjustment for multiple comparisons: Least Significant Difference (equivalent to no adjustments). |

|  |  |  |  |
| --- | --- | --- | --- |
| **Univariate Tests1** | | | |
| **Numerator df** | **Denominator df** | **F** | **Sig.** |
| 1 | 72.447 | 1.010 | .318 |

|  |
| --- |
| The F tests the effect of treatment. This test is based on the linearly independent pairwise comparisons among the estimated marginal means.1 |
| 1. Dependent Variable: lnpk. |

DATASET CLOSE pkdataset.

TITLE "RDS13".

RDS13

GET DATA

/TYPE=XLSX

/FILE='.\rds01.xlsx'

/SHEET=name 'rds13'

/CELLRANGE=FULL

/READNAMES=ON

/LEADINGSPACES IGNORE=YES

/TRAILINGSPACES IGNORE=YES

/DATATYPEMIN PERCENTAGE=95.0

/HIDDEN IGNORE=YES.

EXECUTE.

DATASET NAME pkdataset WINDOW=FRONT.

COMPUTE lnpk=ln(PK).

EXECUTE.

UNIANOVA lnpk BY period sequence treatment subject

/RANDOM subject

/CONTRAST(treatment)=Simple(1)

/METHOD=SSTYPE(3)

/INTERCEPT=INCLUDE

/CRITERIA=ALPHA(0.05)

/DESIGN=period sequence treatment subject(sequence).

Univariate Analysis of Variance

|  |  |  |
| --- | --- | --- |
| **Notes** | | |
| Output Created | | 28-FEB-2021 17:54:54 |
| Comments | |  |
| Input | Active Dataset | pkdataset |
| Filter | <none> |
| Weight | <none> |
| Split File | <none> |
| N of Rows in Working Data File | 776 |
| Missing Value Handling | Definition of Missing | User-defined missing values are treated as missing. |
| Cases Used | Statistics are based on all cases with valid data for all variables in the model. |
| Syntax | | UNIANOVA lnpk BY period sequence treatment subject  /RANDOM subject  /CONTRAST(treatment)=Simple(1)  /METHOD=SSTYPE(3)  /INTERCEPT=INCLUDE  /CRITERIA=ALPHA(0.05)  /DESIGN=period sequence treatment subject(sequence). |
| Resources | Processor Time | 00:00:00.34 |
| Elapsed Time | 00:00:00.51 |

|  |  |  |
| --- | --- | --- |
| **Between-Subjects Factors** | | |
|  | | **N** |
| period | 1 | 222 |
| 2 | 222 |
| 3 | 222 |
| 4 | 110 |
| sequence | RTRT | 388 |
| TRTR | 388 |
| treatment | R | 388 |
| T | 388 |
| subject | 1 | 4 |
| 2 | 4 |
| 3 | 4 |
| 4 | 4 |
| 5 | 4 |
| 6 | 4 |
| 7 | 4 |
| 8 | 4 |
| 9 | 4 |
| 10 | 4 |
| 11 | 4 |
| 12 | 4 |
| 13 | 4 |
| 14 | 4 |
| 15 | 4 |
| 16 | 4 |
| 17 | 4 |
| 18 | 4 |
| 19 | 4 |
| 20 | 4 |
| 21 | 4 |
| 22 | 4 |
| 23 | 4 |
| 24 | 4 |
| 25 | 4 |
| 26 | 4 |
| 27 | 4 |
| 28 | 4 |
| 29 | 4 |
| 30 | 4 |
| 31 | 4 |
| 32 | 4 |
| 33 | 4 |
| 34 | 4 |
| 35 | 4 |
| 36 | 4 |
| 37 | 4 |
| 38 | 4 |
| 39 | 4 |
| 40 | 4 |
| 41 | 4 |
| 42 | 4 |
| 43 | 4 |
| 44 | 4 |
| 45 | 4 |
| 46 | 4 |
| 47 | 4 |
| 48 | 4 |
| 49 | 4 |
| 50 | 4 |
| 51 | 4 |
| 52 | 4 |
| 53 | 4 |
| 54 | 4 |
| 55 | 4 |
| 56 | 3 |
| 57 | 3 |
| 58 | 3 |
| 59 | 3 |
| 60 | 3 |
| 61 | 3 |
| 62 | 3 |
| 63 | 3 |
| 64 | 3 |
| 65 | 3 |
| 66 | 3 |
| 67 | 3 |
| 68 | 3 |
| 69 | 3 |
| 70 | 3 |
| 71 | 3 |
| 72 | 3 |
| 73 | 3 |
| 74 | 3 |
| 75 | 3 |
| 76 | 3 |
| 77 | 3 |
| 78 | 3 |
| 79 | 3 |
| 80 | 3 |
| 81 | 3 |
| 82 | 3 |
| 83 | 3 |
| 84 | 3 |
| 85 | 3 |
| 86 | 3 |
| 87 | 3 |
| 88 | 3 |
| 89 | 3 |
| 90 | 3 |
| 91 | 3 |
| 92 | 3 |
| 93 | 3 |
| 94 | 3 |
| 95 | 3 |
| 96 | 3 |
| 97 | 3 |
| 98 | 3 |
| 99 | 3 |
| 100 | 3 |
| 101 | 3 |
| 102 | 3 |
| 103 | 3 |
| 104 | 3 |
| 105 | 3 |
| 106 | 3 |
| 107 | 3 |
| 108 | 3 |
| 109 | 3 |
| 110 | 3 |
| 111 | 3 |
| 112 | 4 |
| 113 | 4 |
| 114 | 4 |
| 115 | 4 |
| 116 | 4 |
| 117 | 4 |
| 118 | 4 |
| 119 | 4 |
| 120 | 4 |
| 121 | 4 |
| 122 | 4 |
| 123 | 4 |
| 124 | 4 |
| 125 | 4 |
| 126 | 4 |
| 127 | 4 |
| 128 | 4 |
| 129 | 4 |
| 130 | 4 |
| 131 | 4 |
| 132 | 4 |
| 133 | 4 |
| 134 | 4 |
| 135 | 4 |
| 136 | 4 |
| 137 | 4 |
| 138 | 4 |
| 139 | 4 |
| 140 | 4 |
| 141 | 4 |
| 142 | 4 |
| 143 | 4 |
| 144 | 4 |
| 145 | 4 |
| 146 | 4 |
| 147 | 4 |
| 148 | 4 |
| 149 | 4 |
| 150 | 4 |
| 151 | 4 |
| 152 | 4 |
| 153 | 4 |
| 154 | 4 |
| 155 | 4 |
| 156 | 4 |
| 157 | 4 |
| 158 | 4 |
| 159 | 4 |
| 160 | 4 |
| 161 | 4 |
| 162 | 4 |
| 163 | 4 |
| 164 | 4 |
| 165 | 4 |
| 166 | 4 |
| 167 | 3 |
| 168 | 3 |
| 169 | 3 |
| 170 | 3 |
| 171 | 3 |
| 172 | 3 |
| 173 | 3 |
| 174 | 3 |
| 175 | 3 |
| 176 | 3 |
| 177 | 3 |
| 178 | 3 |
| 179 | 3 |
| 180 | 3 |
| 181 | 3 |
| 182 | 3 |
| 183 | 3 |
| 184 | 3 |
| 185 | 3 |
| 186 | 3 |
| 187 | 3 |
| 188 | 3 |
| 189 | 3 |
| 190 | 3 |
| 191 | 3 |
| 192 | 3 |
| 193 | 3 |
| 194 | 3 |
| 195 | 3 |
| 196 | 3 |
| 197 | 3 |
| 198 | 3 |
| 199 | 3 |
| 200 | 3 |
| 201 | 3 |
| 202 | 3 |
| 203 | 3 |
| 204 | 3 |
| 205 | 3 |
| 206 | 3 |
| 207 | 3 |
| 208 | 3 |
| 209 | 3 |
| 210 | 3 |
| 211 | 3 |
| 212 | 3 |
| 213 | 3 |
| 214 | 3 |
| 215 | 3 |
| 216 | 3 |
| 217 | 3 |
| 218 | 3 |
| 219 | 3 |
| 220 | 3 |
| 221 | 3 |
| 222 | 3 |

|  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- |
| **Tests of Between-Subjects Effects** | | | | | | |
| Dependent Variable: lnpk | | | | | | |
| Source | | **Type III Sum of Squares** | **df** | **Mean Square** | **F** | **Sig.** |
| Intercept | Hypothesis | 13076.796 | 1 | 13076.796 | 3248.722 | .000 |
| Error | 914.002 | 227.069 | 4.0251 |  |  |
| period | Hypothesis | 1.326 | 3 | .442 | 1.011 | .387 |
| Error | 240.495 | 550 | .4372 |  |  |
| sequence | Hypothesis | 2.710 | 1 | 2.710 | .611 | .435 |
| Error | 984.803 | 222.064 | 4.4353 |  |  |
| treatment | Hypothesis | 10.504 | 1 | 10.504 | 24.023 | .000 |
| Error | 240.495 | 550 | .4372 |  |  |
| subject(sequence) | Hypothesis | 1019.293 | 220 | 4.633 | 10.596 | .000 |
| Error | 240.495 | 550 | .4372 |  |  |

|  |
| --- |
| 1. .855 MS(subject(sequence)) + .145 MS(Error) |
| 2. MS(Error) |
| 3. .953 MS(subject(sequence)) + .047 MS(Error) |

|  |  |  |  |
| --- | --- | --- | --- |
| **Expected Mean Squares1,2** | | | |
| Source | **Variance Component** | | |
| **Var(subject(sequence))** | **Var(Error)** | **Quadratic Term** |
| Intercept | 2.986 | 1.000 | Intercept, period, sequence, treatment |
| period | .000 | 1.000 | period |
| sequence | 3.327 | 1.000 | sequence |
| treatment | .000 | 1.000 | treatment |
| subject(sequence) | 3.492 | 1.000 |  |
| Error | .000 | 1.000 |  |

|  |
| --- |
| 1. For each source, the expected mean square equals the sum of the coefficients in the cells times the variance components, plus a quadratic term involving effects in the Quadratic Term cell. |
| 2. Expected Mean Squares are based on the Type III Sums of Squares. |

Custom Hypothesis Tests

|  |  |  |  |
| --- | --- | --- | --- |
| **Contrast Results (K Matrix)** | | | |
| treatment Simple Contrast1 | | | **Dependent Variable** |
| **lnpk** |
| Level 2 vs. Level 1 | Contrast Estimate | | -.238 |
| Hypothesized Value | | 0 |
| Difference (Estimate - Hypothesized) | | -.238 |
| Std. Error | | .049 |
| Sig. | | .000 |
| 95% Confidence Interval for Difference | Lower Bound | -.334 |
| Upper Bound | -.143 |

|  |
| --- |
| 1. Reference category = 1 |

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| **Test Results** | | | | | |
| Dependent Variable: lnpk | | | | | |
| Source | **Sum of Squares** | **df** | **Mean Square** | **F** | **Sig.** |
| Contrast | 10.504 | 1 | 10.504 | 24.023 | .000 |
| Error | 240.495 | 550 | .437 |  |  |

MIXED lnpk BY period sequence treatment subject

/CRITERIA=DFMETHOD(SATTERTHWAITE) CIN(95) MXITER(100) MXSTEP(10) SCORING(1)

SINGULAR(0.000000000001) HCONVERGE(0, ABSOLUTE) LCONVERGE(0, ABSOLUTE) PCONVERGE(0.000001, ABSOLUTE)

/FIXED=period sequence treatment | SSTYPE(3)

/METHOD=REML

/RANDOM= subject(sequence) | COVTYPE(ID)

/EMMEANS=TABLES(treatment) COMPARE REFCAT(FIRST) ADJ(LSD).

Mixed Model Analysis

|  |  |  |
| --- | --- | --- |
| **Notes** | | |
| Output Created | | 28-FEB-2021 17:54:55 |
| Comments | |  |
| Input | Active Dataset | pkdataset |
| Filter | <none> |
| Weight | <none> |
| Split File | <none> |
| N of Rows in Working Data File | 776 |
| Missing Value Handling | Definition of Missing | User-defined missing values are treated as missing. |
| Cases Used | Statistics are based on all cases with valid data for all variables in the model. |
| Syntax | | MIXED lnpk BY period sequence treatment subject  /CRITERIA=DFMETHOD(SATTERTHWAITE) CIN(95) MXITER(100) MXSTEP(10) SCORING(1)  SINGULAR(0.000000000001) HCONVERGE(0, ABSOLUTE) LCONVERGE(0, ABSOLUTE) PCONVERGE(0.000001, ABSOLUTE)  /FIXED=period sequence treatment | SSTYPE(3)  /METHOD=REML  /RANDOM= subject(sequence) | COVTYPE(ID)  /EMMEANS=TABLES(treatment) COMPARE REFCAT(FIRST) ADJ(LSD). |
| Resources | Processor Time | 00:00:01.99 |
| Elapsed Time | 00:00:02.13 |

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| **Model Dimension1** | | | | |
|  | | **Number of Levels** | **Covariance Structure** | **Number of Parameters** |
| Fixed Effects | Intercept | 1 |  | 1 |
| period | 4 |  | 3 |
| sequence | 2 |  | 1 |
| treatment | 2 |  | 1 |
| Random Effects | subject(sequence) | 222 | Identity | 1 |
| Residual | |  |  | 1 |
| Total | | 231 |  | 8 |

|  |
| --- |
| 1. Dependent Variable: lnpk. |

|  |  |
| --- | --- |
| **Information Criteria1** | |
| -2 Restricted Log Likelihood | 2090.10396024 |
| Akaike's Information Criterion (AIC) | 2094.10396024 |
| Hurvich and Tsai's Criterion (AICC) | 2094.11960561 |
| Bozdogan's Criterion (CAIC) | 2105.39674127 |
| Schwarz's Bayesian Criterion (BIC) | 2103.39674127 |

|  |
| --- |
| The information criteria are displayed in smaller-is-better form.1 |
| 1. Dependent Variable: lnpk. |

Fixed Effects

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| **Type III Tests of Fixed Effects1** | | | | |
| Source | **Numerator df** | **Denominator df** | **F** | **Sig.** |
| Intercept | 1 | 227.343 | 3342.208 | .000 |
| period | 3 | 556.608 | 1.013 | .387 |
| sequence | 1 | 222.650 | .649 | .421 |
| treatment | 1 | 554.657 | 23.725 | .000 |

|  |
| --- |
| 1. Dependent Variable: lnpk. |

Covariance Parameters

|  |  |  |  |
| --- | --- | --- | --- |
| **Estimates of Covariance Parameters1** | | | |
| Parameter | | **Estimate** | **Std. Error** |
| Residual | | .436652 | .026294 |
| subject(sequence) | Variance | 1.164638 | .122953 |

|  |
| --- |
| 1. Dependent Variable: lnpk. |

Estimated Marginal Means

treatment

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| **Estimates1** | | | | | |
| treatment | **Mean** | **Std. Error** | **df** | **95% Confidence Interval** | |
| **Lower Bound** | **Upper Bound** |
| R | 4.559 | .081 | 273.320 | 4.400 | 4.717 |
| T | 4.322 | .081 | 273.320 | 4.164 | 4.481 |

|  |
| --- |
| 1. Dependent Variable: lnpk. |

|  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- |
| **Pairwise Comparisons1** | | | | | | |
| (I) treatment | (J) treatment | **Mean Difference (I-J)** | **Std. Error** | **df** | **Sig.3** | **95% Confidence Interval for Difference3** |
| **Lower Bound** |
| T | R | -.23651634\* | .04855811 | 554.65668898 | .00000145 | -.33189661 |

|  |  |  |
| --- | --- | --- |
| **Pairwise Comparisons1** | | |
| (I) treatment | (J) treatment | 95% Confidence Interval for Difference |
| **Upper Bound** |
| T | R | -.14113607 |

|  |
| --- |
| Based on estimated marginal means1 |
| \*. The mean difference is significant at the .05 level. |
| 1. Dependent Variable: lnpk. |
| 3. Adjustment for multiple comparisons: Least Significant Difference (equivalent to no adjustments). |

|  |  |  |  |
| --- | --- | --- | --- |
| **Univariate Tests1** | | | |
| **Numerator df** | **Denominator df** | **F** | **Sig.** |
| 1 | 554.657 | 23.725 | .000 |

|  |
| --- |
| The F tests the effect of treatment. This test is based on the linearly independent pairwise comparisons among the estimated marginal means.1 |
| 1. Dependent Variable: lnpk. |

MIXED lnpk BY period treatment sequence subject

/CRITERIA=CIN(90) MXITER(200) MXSTEP(20) SCORING(2) SINGULAR(0.000000000001) HCONVERGE(0,

RELATIVE) LCONVERGE(0.0000000000001, RELATIVE) PCONVERGE(0, RELATIVE)

/FIXED=period treatment sequence | SSTYPE(3)

/METHOD=REML

/RANDOM=treatment | SUBJECT(subject) COVTYPE(CSH)

/REPEATED=treatment | SUBJECT(subject\*period) COVTYPE(DIAG)

/EMMEANS=TABLES(treatment) COMPARE REFCAT(FIRST) ADJ(LSD).

Mixed Model Analysis

|  |  |  |
| --- | --- | --- |
| **Notes** | | |
| Output Created | | 28-FEB-2021 17:54:57 |
| Comments | |  |
| Input | Active Dataset | pkdataset |
| Filter | <none> |
| Weight | <none> |
| Split File | <none> |
| N of Rows in Working Data File | 776 |
| Missing Value Handling | Definition of Missing | User-defined missing values are treated as missing. |
| Cases Used | Statistics are based on all cases with valid data for all variables in the model. |
| Syntax | | MIXED lnpk BY period treatment sequence subject  /CRITERIA=CIN(90) MXITER(200) MXSTEP(20) SCORING(2) SINGULAR(0.000000000001) HCONVERGE(0,  RELATIVE) LCONVERGE(0.0000000000001, RELATIVE) PCONVERGE(0, RELATIVE)  /FIXED=period treatment sequence | SSTYPE(3)  /METHOD=REML  /RANDOM=treatment | SUBJECT(subject) COVTYPE(CSH)  /REPEATED=treatment | SUBJECT(subject\*period) COVTYPE(DIAG)  /EMMEANS=TABLES(treatment) COMPARE REFCAT(FIRST) ADJ(LSD). |
| Resources | Processor Time | 00:00:00.30 |
| Elapsed Time | 00:00:00.34 |

|  |
| --- |
| **Warnings** |
| The final Hessian matrix is not positive definite although all convergence criteria are satisfied. The MIXED procedure continues despite this warning. Validity of subsequent results cannot be ascertained. |

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| **Model Dimension1** | | | | | |
|  | | **Number of Levels** | **Covariance Structure** | **Number of Parameters** | **Subject Variables** |
| Fixed Effects | Intercept | 1 |  | 1 |  |
| period | 4 |  | 3 |  |
| treatment | 2 |  | 1 |  |
| sequence | 2 |  | 1 |  |
| Random Effects | treatment | 2 | Heterogeneous Compound Symmetry | 3 | subject |
| Repeated Effects | treatment | 2 | Diagonal | 2 | subject \* period |
| Total | | 13 |  | 11 |  |

|  |  |  |
| --- | --- | --- |
| **Model Dimension1** | | |
|  | | **Number of Subjects** |
| Fixed Effects | Intercept |  |
| period |  |
| treatment |  |
| sequence |  |
| Random Effects | treatment |  |
| Repeated Effects | treatment | 776 |
| Total | |  |

|  |
| --- |
| 1. Dependent Variable: lnpk. |

|  |  |
| --- | --- |
| **Information Criteria1** | |
| -2 Restricted Log Likelihood | 2087.48101397 |
| Akaike's Information Criterion (AIC) | 2097.48101397 |
| Hurvich and Tsai's Criterion (AICC) | 2097.55954800 |
| Bozdogan's Criterion (CAIC) | 2125.71296655 |
| Schwarz's Bayesian Criterion (BIC) | 2120.71296655 |

|  |
| --- |
| The information criteria are displayed in smaller-is-better form.1 |
| 1. Dependent Variable: lnpk. |

Fixed Effects

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| **Type III Tests of Fixed Effects1** | | | | |
| Source | **Numerator df** | **Denominator df** | **F** | **Sig.** |
| Intercept | 1 | 183.905 | 3343.942 | .000 |
| period | 3 | 552.426 | 1.015 | .385 |
| treatment | 1 | 553.280 | 23.496 | .000 |
| sequence | 1 | 180.161 | .660 | .417 |

|  |
| --- |
| 1. Dependent Variable: lnpk. |

Covariance Parameters

|  |  |  |  |
| --- | --- | --- | --- |
| **Estimates of Covariance Parameters1** | | | |
| Parameter | | **Estimate** | **Std. Error** |
| Repeated Measures | Var: [treatment=R] | .477 | .045 |
| Var: [treatment=T] | .396 | .038 |
| treatment [subject = subject] | Var: [treatment=R] | 1.200 | .141 |
| Var: [treatment=T] | 1.130 | .130 |
| CSH rho | 1.0002 | .000 |

|  |
| --- |
| 1. Dependent Variable: lnpk. |
| 2. This covariance parameter is redundant. |

Estimated Marginal Means

treatment

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| **Estimates1** | | | | | |
| treatment | **Mean** | **Std. Error** | **df** | **90% Confidence Interval** | |
| **Lower Bound** | **Upper Bound** |
| R | 4.559 | .082 | 229.085 | 4.423 | 4.695 |
| T | 4.323 | .079 | 206.269 | 4.193 | 4.454 |

|  |
| --- |
| 1. Dependent Variable: lnpk. |

|  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- |
| **Pairwise Comparisons1** | | | | | | |
| (I) treatment | (J) treatment | **Mean Difference (I-J)** | **Std. Error** | **df** | **Sig.3** | **90% Confidence Interval for Difference3** |
| **Lower Bound** |
| T | R | -.23549475\* | .04858295 | 553.28020072 | .00000163 | -.31554062 |

|  |  |  |
| --- | --- | --- |
| **Pairwise Comparisons1** | | |
| (I) treatment | (J) treatment | 90% Confidence Interval for Difference |
| **Upper Bound** |
| T | R | -.15544888 |

|  |
| --- |
| Based on estimated marginal means1 |
| \*. The mean difference is significant at the .10 level. |
| 1. Dependent Variable: lnpk. |
| 3. Adjustment for multiple comparisons: Least Significant Difference (equivalent to no adjustments). |

|  |  |  |  |
| --- | --- | --- | --- |
| **Univariate Tests1** | | | |
| **Numerator df** | **Denominator df** | **F** | **Sig.** |
| 1 | 553.280 | 23.496 | .000 |

|  |
| --- |
| The F tests the effect of treatment. This test is based on the linearly independent pairwise comparisons among the estimated marginal means.1 |
| 1. Dependent Variable: lnpk. |

DATASET CLOSE pkdataset.

TITLE "RDS14".

RDS14

GET DATA

/TYPE=XLSX

/FILE='.\rds01.xlsx'

/SHEET=name 'rds14'

/CELLRANGE=FULL

/READNAMES=ON

/LEADINGSPACES IGNORE=YES

/TRAILINGSPACES IGNORE=YES

/DATATYPEMIN PERCENTAGE=95.0

/HIDDEN IGNORE=YES.

EXECUTE.

DATASET NAME pkdataset WINDOW=FRONT.

COMPUTE lnpk=ln(PK).

EXECUTE.

UNIANOVA lnpk BY period sequence treatment subject

/RANDOM subject

/CONTRAST(treatment)=Simple(1)

/METHOD=SSTYPE(3)

/INTERCEPT=INCLUDE

/CRITERIA=ALPHA(0.05)

/DESIGN=period sequence treatment subject(sequence).

Univariate Analysis of Variance

|  |  |  |
| --- | --- | --- |
| **Notes** | | |
| Output Created | | 28-FEB-2021 17:54:58 |
| Comments | |  |
| Input | Active Dataset | pkdataset |
| Filter | <none> |
| Weight | <none> |
| Split File | <none> |
| N of Rows in Working Data File | 273 |
| Missing Value Handling | Definition of Missing | User-defined missing values are treated as missing. |
| Cases Used | Statistics are based on all cases with valid data for all variables in the model. |
| Syntax | | UNIANOVA lnpk BY period sequence treatment subject  /RANDOM subject  /CONTRAST(treatment)=Simple(1)  /METHOD=SSTYPE(3)  /INTERCEPT=INCLUDE  /CRITERIA=ALPHA(0.05)  /DESIGN=period sequence treatment subject(sequence). |
| Resources | Processor Time | 00:00:00.02 |
| Elapsed Time | 00:00:00.04 |

|  |  |  |
| --- | --- | --- |
| **Between-Subjects Factors** | | |
|  | | **N** |
| period | 1 | 77 |
| 2 | 73 |
| 3 | 65 |
| 4 | 58 |
| sequence | RTRT | 135 |
| TRTR | 138 |
| treatment | R | 138 |
| T | 135 |
| subject | 1 | 4 |
| 2 | 3 |
| 3 | 3 |
| 4 | 4 |
| 5 | 4 |
| 6 | 3 |
| 7 | 4 |
| 8 | 4 |
| 9 | 4 |
| 10 | 4 |
| 11 | 3 |
| 12 | 4 |
| 13 | 4 |
| 14 | 4 |
| 15 | 4 |
| 16 | 4 |
| 17 | 4 |
| 18 | 3 |
| 19 | 3 |
| 20 | 3 |
| 21 | 4 |
| 22 | 3 |
| 23 | 3 |
| 24 | 3 |
| 25 | 4 |
| 26 | 4 |
| 27 | 3 |
| 28 | 4 |
| 29 | 3 |
| 30 | 4 |
| 31 | 3 |
| 32 | 4 |
| 33 | 4 |
| 34 | 2 |
| 35 | 3 |
| 36 | 4 |
| 37 | 4 |
| 38 | 4 |
| 39 | 4 |
| 40 | 4 |
| 41 | 4 |
| 42 | 3 |
| 43 | 2 |
| 44 | 4 |
| 45 | 3 |
| 46 | 3 |
| 47 | 4 |
| 48 | 4 |
| 49 | 4 |
| 50 | 4 |
| 51 | 4 |
| 52 | 2 |
| 53 | 4 |
| 54 | 4 |
| 55 | 4 |
| 56 | 1 |
| 57 | 3 |
| 58 | 4 |
| 59 | 3 |
| 60 | 4 |
| 62 | 4 |
| 63 | 4 |
| 64 | 4 |
| 65 | 4 |
| 66 | 3 |
| 67 | 2 |
| 68 | 4 |
| 69 | 3 |
| 70 | 4 |
| 71 | 2 |
| 72 | 4 |
| 73 | 4 |
| 74 | 4 |
| 75 | 4 |
| 76 | 4 |
| 77 | 3 |
| 78 | 4 |

|  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- |
| **Tests of Between-Subjects Effects** | | | | | | |
| Dependent Variable: lnpk | | | | | | |
| Source | | **Type III Sum of Squares** | **df** | **Mean Square** | **F** | **Sig.** |
| Intercept | Hypothesis | 32.524 | 1 | 32.524 | 5.093 | .027 |
| Error | 502.945 | 78.751 | 6.3871 |  |  |
| period | Hypothesis | 4.615 | 3 | 1.538 | .796 | .497 |
| Error | 370.880 | 192 | 1.9322 |  |  |
| sequence | Hypothesis | 2.365 | 1 | 2.365 | .365 | .548 |
| Error | 504.024 | 77.793 | 6.4793 |  |  |
| treatment | Hypothesis | .364 | 1 | .364 | .188 | .665 |
| Error | 370.880 | 192 | 1.9322 |  |  |
| subject(sequence) | Hypothesis | 508.077 | 75 | 6.774 | 3.507 | .000 |
| Error | 370.880 | 192 | 1.9322 |  |  |

|  |
| --- |
| 1. .920 MS(subject(sequence)) + .080 MS(Error) |
| 2. MS(Error) |
| 3. .939 MS(subject(sequence)) + .061 MS(Error) |

|  |  |  |  |
| --- | --- | --- | --- |
| **Expected Mean Squares1,2** | | | |
| Source | **Variance Component** | | |
| **Var(subject(sequence))** | **Var(Error)** | **Quadratic Term** |
| Intercept | 3.253 | 1.000 | Intercept, period, sequence, treatment |
| period | .000 | 1.000 | period |
| sequence | 3.321 | 1.000 | sequence |
| treatment | .000 | 1.000 | treatment |
| subject(sequence) | 3.537 | 1.000 |  |
| Error | .000 | 1.000 |  |

|  |
| --- |
| 1. For each source, the expected mean square equals the sum of the coefficients in the cells times the variance components, plus a quadratic term involving effects in the Quadratic Term cell. |
| 2. Expected Mean Squares are based on the Type III Sums of Squares. |

Custom Hypothesis Tests

|  |  |  |  |
| --- | --- | --- | --- |
| **Contrast Results (K Matrix)** | | | |
| treatment Simple Contrast1 | | | **Dependent Variable** |
| **lnpk** |
| Level 2 vs. Level 1 | Contrast Estimate | | -.074 |
| Hypothesized Value | | 0 |
| Difference (Estimate - Hypothesized) | | -.074 |
| Std. Error | | .171 |
| Sig. | | .665 |
| 95% Confidence Interval for Difference | Lower Bound | -.411 |
| Upper Bound | .263 |

|  |
| --- |
| 1. Reference category = 1 |

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| **Test Results** | | | | | |
| Dependent Variable: lnpk | | | | | |
| Source | **Sum of Squares** | **df** | **Mean Square** | **F** | **Sig.** |
| Contrast | .364 | 1 | .364 | .188 | .665 |
| Error | 370.880 | 192 | 1.932 |  |  |

MIXED lnpk BY period sequence treatment subject

/CRITERIA=DFMETHOD(SATTERTHWAITE) CIN(95) MXITER(100) MXSTEP(10) SCORING(1)

SINGULAR(0.000000000001) HCONVERGE(0, ABSOLUTE) LCONVERGE(0, ABSOLUTE) PCONVERGE(0.000001, ABSOLUTE)

/FIXED=period sequence treatment | SSTYPE(3)

/METHOD=REML

/RANDOM= subject(sequence) | COVTYPE(ID)

/EMMEANS=TABLES(treatment) COMPARE REFCAT(FIRST) ADJ(LSD).

Mixed Model Analysis

|  |  |  |
| --- | --- | --- |
| **Notes** | | |
| Output Created | | 28-FEB-2021 17:54:58 |
| Comments | |  |
| Input | Active Dataset | pkdataset |
| Filter | <none> |
| Weight | <none> |
| Split File | <none> |
| N of Rows in Working Data File | 273 |
| Missing Value Handling | Definition of Missing | User-defined missing values are treated as missing. |
| Cases Used | Statistics are based on all cases with valid data for all variables in the model. |
| Syntax | | MIXED lnpk BY period sequence treatment subject  /CRITERIA=DFMETHOD(SATTERTHWAITE) CIN(95) MXITER(100) MXSTEP(10) SCORING(1)  SINGULAR(0.000000000001) HCONVERGE(0, ABSOLUTE) LCONVERGE(0, ABSOLUTE) PCONVERGE(0.000001, ABSOLUTE)  /FIXED=period sequence treatment | SSTYPE(3)  /METHOD=REML  /RANDOM= subject(sequence) | COVTYPE(ID)  /EMMEANS=TABLES(treatment) COMPARE REFCAT(FIRST) ADJ(LSD). |
| Resources | Processor Time | 00:00:00.20 |
| Elapsed Time | 00:00:00.32 |

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| **Model Dimension1** | | | | |
|  | | **Number of Levels** | **Covariance Structure** | **Number of Parameters** |
| Fixed Effects | Intercept | 1 |  | 1 |
| period | 4 |  | 3 |
| sequence | 2 |  | 1 |
| treatment | 2 |  | 1 |
| Random Effects | subject(sequence) | 77 | Identity | 1 |
| Residual | |  |  | 1 |
| Total | | 86 |  | 8 |

|  |
| --- |
| 1. Dependent Variable: lnpk. |

|  |  |
| --- | --- |
| **Information Criteria1** | |
| -2 Restricted Log Likelihood | 1050.30945494 |
| Akaike's Information Criterion (AIC) | 1054.30945494 |
| Hurvich and Tsai's Criterion (AICC) | 1054.35490948 |
| Bozdogan's Criterion (CAIC) | 1063.48395225 |
| Schwarz's Bayesian Criterion (BIC) | 1061.48395225 |

|  |
| --- |
| The information criteria are displayed in smaller-is-better form.1 |
| 1. Dependent Variable: lnpk. |

Fixed Effects

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| **Type III Tests of Fixed Effects1** | | | | |
| Source | **Numerator df** | **Denominator df** | **F** | **Sig.** |
| Intercept | 1 | 76.615 | 5.808 | .018 |
| period | 3 | 198.945 | .630 | .597 |
| sequence | 1 | 76.095 | .316 | .575 |
| treatment | 1 | 197.440 | .266 | .606 |

|  |
| --- |
| 1. Dependent Variable: lnpk. |

Covariance Parameters

|  |  |  |  |
| --- | --- | --- | --- |
| **Estimates of Covariance Parameters1** | | | |
| Parameter | | **Estimate** | **Std. Error** |
| Residual | | 1.922362 | .195218 |
| subject(sequence) | Variance | 1.350370 | .312739 |

|  |
| --- |
| 1. Dependent Variable: lnpk. |

Estimated Marginal Means

treatment

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| **Estimates1** | | | | | |
| treatment | **Mean** | **Std. Error** | **df** | **95% Confidence Interval** | |
| **Lower Bound** | **Upper Bound** |
| R | .425 | .179 | 120.394 | .071 | .779 |
| T | .337 | .180 | 123.443 | -.019 | .693 |

|  |
| --- |
| 1. Dependent Variable: lnpk. |

|  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- |
| **Pairwise Comparisons1** | | | | | | |
| (I) treatment | (J) treatment | **Mean Difference (I-J)** | **Std. Error** | **df** | **Sig.2** | **95% Confidence Interval for Difference2** |
| **Lower Bound** |
| T | R | -.08755836 | .16968640 | 197.44011079 | .60643104 | -.42218875 |

|  |  |  |
| --- | --- | --- |
| **Pairwise Comparisons1** | | |
| (I) treatment | (J) treatment | 95% Confidence Interval for Difference |
| **Upper Bound** |
| T | R | .24707202 |

|  |
| --- |
| Based on estimated marginal means1 |
| 1. Dependent Variable: lnpk. |
| 2. Adjustment for multiple comparisons: Least Significant Difference (equivalent to no adjustments). |

|  |  |  |  |
| --- | --- | --- | --- |
| **Univariate Tests1** | | | |
| **Numerator df** | **Denominator df** | **F** | **Sig.** |
| 1 | 197.440 | .266 | .606 |

|  |
| --- |
| The F tests the effect of treatment. This test is based on the linearly independent pairwise comparisons among the estimated marginal means.1 |
| 1. Dependent Variable: lnpk. |

MIXED lnpk BY period treatment sequence subject

/CRITERIA=CIN(90) MXITER(200) MXSTEP(20) SCORING(2) SINGULAR(0.000000000001) HCONVERGE(0,

RELATIVE) LCONVERGE(0.0000000000001, RELATIVE) PCONVERGE(0, RELATIVE)

/FIXED=period treatment sequence | SSTYPE(3)

/METHOD=REML

/RANDOM=treatment | SUBJECT(subject) COVTYPE(CSH)

/REPEATED=treatment | SUBJECT(subject\*period) COVTYPE(DIAG)

/EMMEANS=TABLES(treatment) COMPARE REFCAT(FIRST) ADJ(LSD).

Mixed Model Analysis

|  |  |  |
| --- | --- | --- |
| **Notes** | | |
| Output Created | | 28-FEB-2021 17:54:58 |
| Comments | |  |
| Input | Active Dataset | pkdataset |
| Filter | <none> |
| Weight | <none> |
| Split File | <none> |
| N of Rows in Working Data File | 273 |
| Missing Value Handling | Definition of Missing | User-defined missing values are treated as missing. |
| Cases Used | Statistics are based on all cases with valid data for all variables in the model. |
| Syntax | | MIXED lnpk BY period treatment sequence subject  /CRITERIA=CIN(90) MXITER(200) MXSTEP(20) SCORING(2) SINGULAR(0.000000000001) HCONVERGE(0,  RELATIVE) LCONVERGE(0.0000000000001, RELATIVE) PCONVERGE(0, RELATIVE)  /FIXED=period treatment sequence | SSTYPE(3)  /METHOD=REML  /RANDOM=treatment | SUBJECT(subject) COVTYPE(CSH)  /REPEATED=treatment | SUBJECT(subject\*period) COVTYPE(DIAG)  /EMMEANS=TABLES(treatment) COMPARE REFCAT(FIRST) ADJ(LSD). |
| Resources | Processor Time | 00:00:00.11 |
| Elapsed Time | 00:00:00.12 |

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| **Model Dimension1** | | | | | |
|  | | **Number of Levels** | **Covariance Structure** | **Number of Parameters** | **Subject Variables** |
| Fixed Effects | Intercept | 1 |  | 1 |  |
| period | 4 |  | 3 |  |
| treatment | 2 |  | 1 |  |
| sequence | 2 |  | 1 |  |
| Random Effects | treatment | 2 | Heterogeneous Compound Symmetry | 3 | subject |
| Repeated Effects | treatment | 2 | Diagonal | 2 | subject \* period |
| Total | | 13 |  | 11 |  |

|  |  |  |
| --- | --- | --- |
| **Model Dimension1** | | |
|  | | **Number of Subjects** |
| Fixed Effects | Intercept |  |
| period |  |
| treatment |  |
| sequence |  |
| Random Effects | treatment |  |
| Repeated Effects | treatment | 273 |
| Total | |  |

|  |
| --- |
| 1. Dependent Variable: lnpk. |

|  |  |
| --- | --- |
| **Information Criteria1** | |
| -2 Restricted Log Likelihood | 1012.35169892 |
| Akaike's Information Criterion (AIC) | 1022.35169892 |
| Hurvich and Tsai's Criterion (AICC) | 1022.58158398 |
| Bozdogan's Criterion (CAIC) | 1045.28794222 |
| Schwarz's Bayesian Criterion (BIC) | 1040.28794222 |

|  |
| --- |
| The information criteria are displayed in smaller-is-better form.1 |
| 1. Dependent Variable: lnpk. |

Fixed Effects

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| **Type III Tests of Fixed Effects1** | | | | |
| Source | **Numerator df** | **Denominator df** | **F** | **Sig.** |
| Intercept | 1 | 76.065 | 5.191 | .026 |
| period | 3 | 146.070 | 1.248 | .295 |
| treatment | 1 | 74.480 | .057 | .811 |
| sequence | 1 | 75.599 | .426 | .516 |

|  |
| --- |
| 1. Dependent Variable: lnpk. |

Covariance Parameters

|  |  |  |  |
| --- | --- | --- | --- |
| **Estimates of Covariance Parameters1** | | | |
| Parameter | | **Estimate** | **Std. Error** |
| Repeated Measures | Var: [treatment=R] | .951 | .173 |
| Var: [treatment=T] | 1.139 | .207 |
| treatment [subject = subject] | Var: [treatment=R] | 3.012 | .599 |
| Var: [treatment=T] | 1.512 | .366 |
| CSH rho | .452 | .129 |

|  |
| --- |
| 1. Dependent Variable: lnpk. |

Estimated Marginal Means

treatment

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| **Estimates1** | | | | | |
| treatment | **Mean** | **Std. Error** | **df** | **90% Confidence Interval** | |
| **Lower Bound** | **Upper Bound** |
| R | .389 | .217 | 73.304 | .028 | .750 |
| T | .335 | .169 | 77.603 | .053 | .617 |

|  |
| --- |
| 1. Dependent Variable: lnpk. |

|  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- |
| **Pairwise Comparisons1** | | | | | | |
| (I) treatment | (J) treatment | **Mean Difference (I-J)** | **Std. Error** | **df** | **Sig.2** | **90% Confidence Interval for Difference2** |
| **Lower Bound** |
| T | R | -.05376487 | .22423693 | 74.47994484 | .81116866 | -.42724735 |

|  |  |  |
| --- | --- | --- |
| **Pairwise Comparisons1** | | |
| (I) treatment | (J) treatment | 90% Confidence Interval for Difference |
| **Upper Bound** |
| T | R | .31971762 |

|  |
| --- |
| Based on estimated marginal means1 |
| 1. Dependent Variable: lnpk. |
| 2. Adjustment for multiple comparisons: Least Significant Difference (equivalent to no adjustments). |

|  |  |  |  |
| --- | --- | --- | --- |
| **Univariate Tests1** | | | |
| **Numerator df** | **Denominator df** | **F** | **Sig.** |
| 1 | 74.480 | .057 | .811 |

|  |
| --- |
| The F tests the effect of treatment. This test is based on the linearly independent pairwise comparisons among the estimated marginal means.1 |
| 1. Dependent Variable: lnpk. |

DATASET CLOSE pkdataset.

TITLE "RDS15".

RDS15

GET DATA

/TYPE=XLSX

/FILE='.\rds01.xlsx'

/SHEET=name 'rds15'

/CELLRANGE=FULL

/READNAMES=ON

/LEADINGSPACES IGNORE=YES

/TRAILINGSPACES IGNORE=YES

/DATATYPEMIN PERCENTAGE=95.0

/HIDDEN IGNORE=YES.

EXECUTE.

DATASET NAME pkdataset WINDOW=FRONT.

COMPUTE lnpk=ln(PK).

EXECUTE.

UNIANOVA lnpk BY period sequence treatment subject

/RANDOM subject

/CONTRAST(treatment)=Simple(1)

/METHOD=SSTYPE(3)

/INTERCEPT=INCLUDE

/CRITERIA=ALPHA(0.05)

/DESIGN=period sequence treatment subject(sequence).

Univariate Analysis of Variance

|  |  |  |
| --- | --- | --- |
| **Notes** | | |
| Output Created | | 28-FEB-2021 17:54:59 |
| Comments | |  |
| Input | Active Dataset | pkdataset |
| Filter | <none> |
| Weight | <none> |
| Split File | <none> |
| N of Rows in Working Data File | 888 |
| Missing Value Handling | Definition of Missing | User-defined missing values are treated as missing. |
| Cases Used | Statistics are based on all cases with valid data for all variables in the model. |
| Syntax | | UNIANOVA lnpk BY period sequence treatment subject  /RANDOM subject  /CONTRAST(treatment)=Simple(1)  /METHOD=SSTYPE(3)  /INTERCEPT=INCLUDE  /CRITERIA=ALPHA(0.05)  /DESIGN=period sequence treatment subject(sequence). |
| Resources | Processor Time | 00:00:00.31 |
| Elapsed Time | 00:00:00.39 |

|  |  |  |
| --- | --- | --- |
| **Between-Subjects Factors** | | |
|  | | **N** |
| period | 1 | 222 |
| 2 | 222 |
| 3 | 222 |
| 4 | 110 |
| sequence | RTRT | 388 |
| TRTR | 388 |
| treatment | R | 388 |
| T | 388 |
| subject | 1 | 4 |
| 2 | 4 |
| 3 | 4 |
| 4 | 4 |
| 5 | 4 |
| 6 | 4 |
| 7 | 4 |
| 8 | 4 |
| 9 | 4 |
| 10 | 4 |
| 11 | 4 |
| 12 | 4 |
| 13 | 4 |
| 14 | 4 |
| 15 | 4 |
| 16 | 4 |
| 17 | 4 |
| 18 | 4 |
| 19 | 4 |
| 20 | 4 |
| 21 | 4 |
| 22 | 4 |
| 23 | 4 |
| 24 | 4 |
| 25 | 4 |
| 26 | 4 |
| 27 | 4 |
| 28 | 4 |
| 29 | 4 |
| 30 | 4 |
| 31 | 4 |
| 32 | 4 |
| 33 | 4 |
| 34 | 4 |
| 35 | 4 |
| 36 | 4 |
| 37 | 4 |
| 38 | 4 |
| 39 | 4 |
| 40 | 4 |
| 41 | 4 |
| 42 | 4 |
| 43 | 4 |
| 44 | 4 |
| 45 | 4 |
| 46 | 4 |
| 47 | 4 |
| 48 | 4 |
| 49 | 4 |
| 50 | 4 |
| 51 | 4 |
| 52 | 4 |
| 53 | 4 |
| 54 | 4 |
| 55 | 4 |
| 56 | 3 |
| 57 | 3 |
| 58 | 3 |
| 59 | 3 |
| 60 | 3 |
| 61 | 3 |
| 62 | 3 |
| 63 | 3 |
| 64 | 3 |
| 65 | 3 |
| 66 | 3 |
| 67 | 3 |
| 68 | 3 |
| 69 | 3 |
| 70 | 3 |
| 71 | 3 |
| 72 | 3 |
| 73 | 3 |
| 74 | 3 |
| 75 | 3 |
| 76 | 3 |
| 77 | 3 |
| 78 | 3 |
| 79 | 3 |
| 80 | 3 |
| 81 | 3 |
| 82 | 3 |
| 83 | 3 |
| 84 | 3 |
| 85 | 3 |
| 86 | 3 |
| 87 | 3 |
| 88 | 3 |
| 89 | 3 |
| 90 | 3 |
| 91 | 3 |
| 92 | 3 |
| 93 | 3 |
| 94 | 3 |
| 95 | 3 |
| 96 | 3 |
| 97 | 3 |
| 98 | 3 |
| 99 | 3 |
| 100 | 3 |
| 101 | 3 |
| 102 | 3 |
| 103 | 3 |
| 104 | 3 |
| 105 | 3 |
| 106 | 3 |
| 107 | 3 |
| 108 | 3 |
| 109 | 3 |
| 110 | 3 |
| 111 | 3 |
| 112 | 4 |
| 113 | 4 |
| 114 | 4 |
| 115 | 4 |
| 116 | 4 |
| 117 | 4 |
| 118 | 4 |
| 119 | 4 |
| 120 | 4 |
| 121 | 4 |
| 122 | 4 |
| 123 | 4 |
| 124 | 4 |
| 125 | 4 |
| 126 | 4 |
| 127 | 4 |
| 128 | 4 |
| 129 | 4 |
| 130 | 4 |
| 131 | 4 |
| 132 | 4 |
| 133 | 4 |
| 134 | 4 |
| 135 | 4 |
| 136 | 4 |
| 137 | 4 |
| 138 | 4 |
| 139 | 4 |
| 140 | 4 |
| 141 | 4 |
| 142 | 4 |
| 143 | 4 |
| 144 | 4 |
| 145 | 4 |
| 146 | 4 |
| 147 | 4 |
| 148 | 4 |
| 149 | 4 |
| 150 | 4 |
| 151 | 4 |
| 152 | 4 |
| 153 | 4 |
| 154 | 4 |
| 155 | 4 |
| 156 | 4 |
| 157 | 4 |
| 158 | 4 |
| 159 | 4 |
| 160 | 4 |
| 161 | 4 |
| 162 | 4 |
| 163 | 4 |
| 164 | 4 |
| 165 | 4 |
| 166 | 4 |
| 167 | 3 |
| 168 | 3 |
| 169 | 3 |
| 170 | 3 |
| 171 | 3 |
| 172 | 3 |
| 173 | 3 |
| 174 | 3 |
| 175 | 3 |
| 176 | 3 |
| 177 | 3 |
| 178 | 3 |
| 179 | 3 |
| 180 | 3 |
| 181 | 3 |
| 182 | 3 |
| 183 | 3 |
| 184 | 3 |
| 185 | 3 |
| 186 | 3 |
| 187 | 3 |
| 188 | 3 |
| 189 | 3 |
| 190 | 3 |
| 191 | 3 |
| 192 | 3 |
| 193 | 3 |
| 194 | 3 |
| 195 | 3 |
| 196 | 3 |
| 197 | 3 |
| 198 | 3 |
| 199 | 3 |
| 200 | 3 |
| 201 | 3 |
| 202 | 3 |
| 203 | 3 |
| 204 | 3 |
| 205 | 3 |
| 206 | 3 |
| 207 | 3 |
| 208 | 3 |
| 209 | 3 |
| 210 | 3 |
| 211 | 3 |
| 212 | 3 |
| 213 | 3 |
| 214 | 3 |
| 215 | 3 |
| 216 | 3 |
| 217 | 3 |
| 218 | 3 |
| 219 | 3 |
| 220 | 3 |
| 221 | 3 |
| 222 | 3 |

|  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- |
| **Tests of Between-Subjects Effects** | | | | | | |
| Dependent Variable: lnpk | | | | | | |
| Source | | **Type III Sum of Squares** | **df** | **Mean Square** | **F** | **Sig.** |
| Intercept | Hypothesis | 13076.796 | 1 | 13076.796 | 3248.722 | .000 |
| Error | 914.002 | 227.069 | 4.0251 |  |  |
| period | Hypothesis | 1.326 | 3 | .442 | 1.011 | .387 |
| Error | 240.495 | 550 | .4372 |  |  |
| sequence | Hypothesis | 2.710 | 1 | 2.710 | .611 | .435 |
| Error | 984.803 | 222.064 | 4.4353 |  |  |
| treatment | Hypothesis | 10.504 | 1 | 10.504 | 24.023 | .000 |
| Error | 240.495 | 550 | .4372 |  |  |
| subject(sequence) | Hypothesis | 1019.293 | 220 | 4.633 | 10.596 | .000 |
| Error | 240.495 | 550 | .4372 |  |  |

|  |
| --- |
| 1. .855 MS(subject(sequence)) + .145 MS(Error) |
| 2. MS(Error) |
| 3. .953 MS(subject(sequence)) + .047 MS(Error) |

|  |  |  |  |
| --- | --- | --- | --- |
| **Expected Mean Squares1,2** | | | |
| Source | **Variance Component** | | |
| **Var(subject(sequence))** | **Var(Error)** | **Quadratic Term** |
| Intercept | 2.986 | 1.000 | Intercept, period, sequence, treatment |
| period | .000 | 1.000 | period |
| sequence | 3.327 | 1.000 | sequence |
| treatment | .000 | 1.000 | treatment |
| subject(sequence) | 3.492 | 1.000 |  |
| Error | .000 | 1.000 |  |

|  |
| --- |
| 1. For each source, the expected mean square equals the sum of the coefficients in the cells times the variance components, plus a quadratic term involving effects in the Quadratic Term cell. |
| 2. Expected Mean Squares are based on the Type III Sums of Squares. |

Custom Hypothesis Tests

|  |  |  |  |
| --- | --- | --- | --- |
| **Contrast Results (K Matrix)** | | | |
| treatment Simple Contrast1 | | | **Dependent Variable** |
| **lnpk** |
| Level 2 vs. Level 1 | Contrast Estimate | | -.238 |
| Hypothesized Value | | 0 |
| Difference (Estimate - Hypothesized) | | -.238 |
| Std. Error | | .049 |
| Sig. | | .000 |
| 95% Confidence Interval for Difference | Lower Bound | -.334 |
| Upper Bound | -.143 |

|  |
| --- |
| 1. Reference category = 1 |

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| **Test Results** | | | | | |
| Dependent Variable: lnpk | | | | | |
| Source | **Sum of Squares** | **df** | **Mean Square** | **F** | **Sig.** |
| Contrast | 10.504 | 1 | 10.504 | 24.023 | .000 |
| Error | 240.495 | 550 | .437 |  |  |

MIXED lnpk BY period sequence treatment subject

/CRITERIA=DFMETHOD(SATTERTHWAITE) CIN(95) MXITER(100) MXSTEP(10) SCORING(1)

SINGULAR(0.000000000001) HCONVERGE(0, ABSOLUTE) LCONVERGE(0, ABSOLUTE) PCONVERGE(0.000001, ABSOLUTE)

/FIXED=period sequence treatment | SSTYPE(3)

/METHOD=REML

/RANDOM= subject(sequence) | COVTYPE(ID)

/EMMEANS=TABLES(treatment) COMPARE REFCAT(FIRST) ADJ(LSD).

Mixed Model Analysis

|  |  |  |
| --- | --- | --- |
| **Notes** | | |
| Output Created | | 28-FEB-2021 17:55:00 |
| Comments | |  |
| Input | Active Dataset | pkdataset |
| Filter | <none> |
| Weight | <none> |
| Split File | <none> |
| N of Rows in Working Data File | 888 |
| Missing Value Handling | Definition of Missing | User-defined missing values are treated as missing. |
| Cases Used | Statistics are based on all cases with valid data for all variables in the model. |
| Syntax | | MIXED lnpk BY period sequence treatment subject  /CRITERIA=DFMETHOD(SATTERTHWAITE) CIN(95) MXITER(100) MXSTEP(10) SCORING(1)  SINGULAR(0.000000000001) HCONVERGE(0, ABSOLUTE) LCONVERGE(0, ABSOLUTE) PCONVERGE(0.000001, ABSOLUTE)  /FIXED=period sequence treatment | SSTYPE(3)  /METHOD=REML  /RANDOM= subject(sequence) | COVTYPE(ID)  /EMMEANS=TABLES(treatment) COMPARE REFCAT(FIRST) ADJ(LSD). |
| Resources | Processor Time | 00:00:02.22 |
| Elapsed Time | 00:00:02.43 |

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| **Model Dimension1** | | | | |
|  | | **Number of Levels** | **Covariance Structure** | **Number of Parameters** |
| Fixed Effects | Intercept | 1 |  | 1 |
| period | 4 |  | 3 |
| sequence | 2 |  | 1 |
| treatment | 2 |  | 1 |
| Random Effects | subject(sequence) | 222 | Identity | 1 |
| Residual | |  |  | 1 |
| Total | | 231 |  | 8 |

|  |
| --- |
| 1. Dependent Variable: lnpk. |

|  |  |
| --- | --- |
| **Information Criteria1** | |
| -2 Restricted Log Likelihood | 2090.10396024 |
| Akaike's Information Criterion (AIC) | 2094.10396024 |
| Hurvich and Tsai's Criterion (AICC) | 2094.11960561 |
| Bozdogan's Criterion (CAIC) | 2105.39674127 |
| Schwarz's Bayesian Criterion (BIC) | 2103.39674127 |

|  |
| --- |
| The information criteria are displayed in smaller-is-better form.1 |
| 1. Dependent Variable: lnpk. |

Fixed Effects

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| **Type III Tests of Fixed Effects1** | | | | |
| Source | **Numerator df** | **Denominator df** | **F** | **Sig.** |
| Intercept | 1 | 227.343 | 3342.208 | .000 |
| period | 3 | 556.608 | 1.013 | .387 |
| sequence | 1 | 222.650 | .649 | .421 |
| treatment | 1 | 554.657 | 23.725 | .000 |

|  |
| --- |
| 1. Dependent Variable: lnpk. |

Covariance Parameters

|  |  |  |  |
| --- | --- | --- | --- |
| **Estimates of Covariance Parameters1** | | | |
| Parameter | | **Estimate** | **Std. Error** |
| Residual | | .436652 | .026294 |
| subject(sequence) | Variance | 1.164638 | .122953 |

|  |
| --- |
| 1. Dependent Variable: lnpk. |

Estimated Marginal Means

treatment

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| **Estimates1** | | | | | |
| treatment | **Mean** | **Std. Error** | **df** | **95% Confidence Interval** | |
| **Lower Bound** | **Upper Bound** |
| R | 4.559 | .081 | 273.320 | 4.400 | 4.717 |
| T | 4.322 | .081 | 273.320 | 4.164 | 4.481 |

|  |
| --- |
| 1. Dependent Variable: lnpk. |

|  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- |
| **Pairwise Comparisons1** | | | | | | |
| (I) treatment | (J) treatment | **Mean Difference (I-J)** | **Std. Error** | **df** | **Sig.3** | **95% Confidence Interval for Difference3** |
| **Lower Bound** |
| T | R | -.23651634\* | .04855811 | 554.65668898 | .00000145 | -.33189661 |

|  |  |  |
| --- | --- | --- |
| **Pairwise Comparisons1** | | |
| (I) treatment | (J) treatment | 95% Confidence Interval for Difference |
| **Upper Bound** |
| T | R | -.14113607 |

|  |
| --- |
| Based on estimated marginal means1 |
| \*. The mean difference is significant at the .05 level. |
| 1. Dependent Variable: lnpk. |
| 3. Adjustment for multiple comparisons: Least Significant Difference (equivalent to no adjustments). |

|  |  |  |  |
| --- | --- | --- | --- |
| **Univariate Tests1** | | | |
| **Numerator df** | **Denominator df** | **F** | **Sig.** |
| 1 | 554.657 | 23.725 | .000 |

|  |
| --- |
| The F tests the effect of treatment. This test is based on the linearly independent pairwise comparisons among the estimated marginal means.1 |
| 1. Dependent Variable: lnpk. |

MIXED lnpk BY period treatment sequence subject

/CRITERIA=CIN(90) MXITER(200) MXSTEP(20) SCORING(2) SINGULAR(0.000000000001) HCONVERGE(0,

RELATIVE) LCONVERGE(0.0000000000001, RELATIVE) PCONVERGE(0, RELATIVE)

/FIXED=period treatment sequence | SSTYPE(3)

/METHOD=REML

/RANDOM=treatment | SUBJECT(subject) COVTYPE(CSH)

/REPEATED=treatment | SUBJECT(subject\*period) COVTYPE(DIAG)

/EMMEANS=TABLES(treatment) COMPARE REFCAT(FIRST) ADJ(LSD).

Mixed Model Analysis

|  |  |  |
| --- | --- | --- |
| **Notes** | | |
| Output Created | | 28-FEB-2021 17:55:02 |
| Comments | |  |
| Input | Active Dataset | pkdataset |
| Filter | <none> |
| Weight | <none> |
| Split File | <none> |
| N of Rows in Working Data File | 888 |
| Missing Value Handling | Definition of Missing | User-defined missing values are treated as missing. |
| Cases Used | Statistics are based on all cases with valid data for all variables in the model. |
| Syntax | | MIXED lnpk BY period treatment sequence subject  /CRITERIA=CIN(90) MXITER(200) MXSTEP(20) SCORING(2) SINGULAR(0.000000000001) HCONVERGE(0,  RELATIVE) LCONVERGE(0.0000000000001, RELATIVE) PCONVERGE(0, RELATIVE)  /FIXED=period treatment sequence | SSTYPE(3)  /METHOD=REML  /RANDOM=treatment | SUBJECT(subject) COVTYPE(CSH)  /REPEATED=treatment | SUBJECT(subject\*period) COVTYPE(DIAG)  /EMMEANS=TABLES(treatment) COMPARE REFCAT(FIRST) ADJ(LSD). |
| Resources | Processor Time | 00:00:00.23 |
| Elapsed Time | 00:00:00.27 |

|  |
| --- |
| **Warnings** |
| The final Hessian matrix is not positive definite although all convergence criteria are satisfied. The MIXED procedure continues despite this warning. Validity of subsequent results cannot be ascertained. |

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| **Model Dimension1** | | | | | |
|  | | **Number of Levels** | **Covariance Structure** | **Number of Parameters** | **Subject Variables** |
| Fixed Effects | Intercept | 1 |  | 1 |  |
| period | 4 |  | 3 |  |
| treatment | 2 |  | 1 |  |
| sequence | 2 |  | 1 |  |
| Random Effects | treatment | 2 | Heterogeneous Compound Symmetry | 3 | subject |
| Repeated Effects | treatment | 2 | Diagonal | 2 | subject \* period |
| Total | | 13 |  | 11 |  |

|  |  |  |
| --- | --- | --- |
| **Model Dimension1** | | |
|  | | **Number of Subjects** |
| Fixed Effects | Intercept |  |
| period |  |
| treatment |  |
| sequence |  |
| Random Effects | treatment |  |
| Repeated Effects | treatment | 776 |
| Total | |  |

|  |
| --- |
| 1. Dependent Variable: lnpk. |

|  |  |
| --- | --- |
| **Information Criteria1** | |
| -2 Restricted Log Likelihood | 2087.48101397 |
| Akaike's Information Criterion (AIC) | 2097.48101397 |
| Hurvich and Tsai's Criterion (AICC) | 2097.55954800 |
| Bozdogan's Criterion (CAIC) | 2125.71296655 |
| Schwarz's Bayesian Criterion (BIC) | 2120.71296655 |

|  |
| --- |
| The information criteria are displayed in smaller-is-better form.1 |
| 1. Dependent Variable: lnpk. |

Fixed Effects

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| **Type III Tests of Fixed Effects1** | | | | |
| Source | **Numerator df** | **Denominator df** | **F** | **Sig.** |
| Intercept | 1 | 183.905 | 3343.942 | .000 |
| period | 3 | 552.426 | 1.015 | .385 |
| treatment | 1 | 553.280 | 23.496 | .000 |
| sequence | 1 | 180.161 | .660 | .417 |

|  |
| --- |
| 1. Dependent Variable: lnpk. |

Covariance Parameters

|  |  |  |  |
| --- | --- | --- | --- |
| **Estimates of Covariance Parameters1** | | | |
| Parameter | | **Estimate** | **Std. Error** |
| Repeated Measures | Var: [treatment=R] | .477 | .045 |
| Var: [treatment=T] | .396 | .038 |
| treatment [subject = subject] | Var: [treatment=R] | 1.200 | .141 |
| Var: [treatment=T] | 1.130 | .130 |
| CSH rho | 1.0002 | .000 |

|  |
| --- |
| 1. Dependent Variable: lnpk. |
| 2. This covariance parameter is redundant. |

Estimated Marginal Means

treatment

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| **Estimates1** | | | | | |
| treatment | **Mean** | **Std. Error** | **df** | **90% Confidence Interval** | |
| **Lower Bound** | **Upper Bound** |
| R | 4.559 | .082 | 229.085 | 4.423 | 4.695 |
| T | 4.323 | .079 | 206.269 | 4.193 | 4.454 |

|  |
| --- |
| 1. Dependent Variable: lnpk. |

|  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- |
| **Pairwise Comparisons1** | | | | | | |
| (I) treatment | (J) treatment | **Mean Difference (I-J)** | **Std. Error** | **df** | **Sig.3** | **90% Confidence Interval for Difference3** |
| **Lower Bound** |
| T | R | -.23549475\* | .04858295 | 553.28020072 | .00000163 | -.31554062 |

|  |  |  |
| --- | --- | --- |
| **Pairwise Comparisons1** | | |
| (I) treatment | (J) treatment | 90% Confidence Interval for Difference |
| **Upper Bound** |
| T | R | -.15544888 |

|  |
| --- |
| Based on estimated marginal means1 |
| \*. The mean difference is significant at the .10 level. |
| 1. Dependent Variable: lnpk. |
| 3. Adjustment for multiple comparisons: Least Significant Difference (equivalent to no adjustments). |

|  |  |  |  |
| --- | --- | --- | --- |
| **Univariate Tests1** | | | |
| **Numerator df** | **Denominator df** | **F** | **Sig.** |
| 1 | 553.280 | 23.496 | .000 |

|  |
| --- |
| The F tests the effect of treatment. This test is based on the linearly independent pairwise comparisons among the estimated marginal means.1 |
| 1. Dependent Variable: lnpk. |

DATASET CLOSE pkdataset.

TITLE "RDS16".

RDS16

GET DATA

/TYPE=XLSX

/FILE='.\rds01.xlsx'

/SHEET=name 'rds16'

/CELLRANGE=FULL

/READNAMES=ON

/LEADINGSPACES IGNORE=YES

/TRAILINGSPACES IGNORE=YES

/DATATYPEMIN PERCENTAGE=95.0

/HIDDEN IGNORE=YES.

EXECUTE.

DATASET NAME pkdataset WINDOW=FRONT.

COMPUTE lnpk=ln(PK).

EXECUTE.

UNIANOVA lnpk BY period sequence treatment subject

/RANDOM subject

/CONTRAST(treatment)=Simple(1)

/METHOD=SSTYPE(3)

/INTERCEPT=INCLUDE

/CRITERIA=ALPHA(0.05)

/DESIGN=period sequence treatment subject(sequence).

Univariate Analysis of Variance

|  |  |  |
| --- | --- | --- |
| **Notes** | | |
| Output Created | | 28-FEB-2021 17:55:03 |
| Comments | |  |
| Input | Active Dataset | pkdataset |
| Filter | <none> |
| Weight | <none> |
| Split File | <none> |
| N of Rows in Working Data File | 152 |
| Missing Value Handling | Definition of Missing | User-defined missing values are treated as missing. |
| Cases Used | Statistics are based on all cases with valid data for all variables in the model. |
| Syntax | | UNIANOVA lnpk BY period sequence treatment subject  /RANDOM subject  /CONTRAST(treatment)=Simple(1)  /METHOD=SSTYPE(3)  /INTERCEPT=INCLUDE  /CRITERIA=ALPHA(0.05)  /DESIGN=period sequence treatment subject(sequence). |
| Resources | Processor Time | 00:00:00.02 |
| Elapsed Time | 00:00:00.02 |

|  |  |  |
| --- | --- | --- |
| **Between-Subjects Factors** | | |
|  | | **N** |
| period | 1 | 38 |
| 2 | 38 |
| 3 | 38 |
| 4 | 38 |
| sequence | RTTR | 80 |
| TRRT | 72 |
| treatment | R | 76 |
| T | 76 |
| subject | 1 | 4 |
| 2 | 4 |
| 3 | 4 |
| 4 | 4 |
| 5 | 4 |
| 6 | 4 |
| 7 | 4 |
| 8 | 4 |
| 9 | 4 |
| 10 | 4 |
| 11 | 4 |
| 12 | 4 |
| 13 | 4 |
| 16 | 4 |
| 17 | 4 |
| 18 | 4 |
| 19 | 4 |
| 20 | 4 |
| 21 | 4 |
| 22 | 4 |
| 23 | 4 |
| 24 | 4 |
| 25 | 4 |
| 26 | 4 |
| 27 | 4 |
| 28 | 4 |
| 29 | 4 |
| 30 | 4 |
| 31 | 4 |
| 32 | 4 |
| 33 | 4 |
| 34 | 4 |
| 35 | 4 |
| 36 | 4 |
| 37 | 4 |
| 38 | 4 |
| 39 | 4 |
| 40 | 4 |

|  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- |
| **Tests of Between-Subjects Effects** | | | | | | |
| Dependent Variable: lnpk | | | | | | |
| Source | | **Type III Sum of Squares** | **df** | **Mean Square** | **F** | **Sig.** |
| Intercept | Hypothesis | 62.807 | 1 | 62.807 | 12.326 | .001 |
| Error | 183.435 | 36 | 5.0951 |  |  |
| period | Hypothesis | 1.838 | 3 | .613 | 2.828 | .042 |
| Error | 23.833 | 110 | .2172 |  |  |
| sequence | Hypothesis | 2.083 | 1 | 2.083 | .409 | .527 |
| Error | 183.435 | 36 | 5.0951 |  |  |
| treatment | Hypothesis | 2.144 | 1 | 2.144 | 9.894 | .002 |
| Error | 23.833 | 110 | .2172 |  |  |
| subject(sequence) | Hypothesis | 183.435 | 36 | 5.095 | 23.517 | .000 |
| Error | 23.833 | 110 | .2172 |  |  |

|  |
| --- |
| 1. MS(subject(sequence)) |
| 2. MS(Error) |

|  |  |  |  |
| --- | --- | --- | --- |
| **Expected Mean Squares1,2** | | | |
| Source | **Variance Component** | | |
| **Var(subject(sequence))** | **Var(Error)** | **Quadratic Term** |
| Intercept | 4.000 | 1.000 | Intercept, period, sequence, treatment |
| period | .000 | 1.000 | period |
| sequence | 4.000 | 1.000 | sequence |
| treatment | .000 | 1.000 | treatment |
| subject(sequence) | 4.000 | 1.000 |  |
| Error | .000 | 1.000 |  |

|  |
| --- |
| 1. For each source, the expected mean square equals the sum of the coefficients in the cells times the variance components, plus a quadratic term involving effects in the Quadratic Term cell. |
| 2. Expected Mean Squares are based on the Type III Sums of Squares. |

Custom Hypothesis Tests

|  |  |  |  |
| --- | --- | --- | --- |
| **Contrast Results (K Matrix)** | | | |
| treatment Simple Contrast1 | | | **Dependent Variable** |
| **lnpk** |
| Level 2 vs. Level 1 | Contrast Estimate | | -.238 |
| Hypothesized Value | | 0 |
| Difference (Estimate - Hypothesized) | | -.238 |
| Std. Error | | .076 |
| Sig. | | .002 |
| 95% Confidence Interval for Difference | Lower Bound | -.388 |
| Upper Bound | -.088 |

|  |
| --- |
| 1. Reference category = 1 |

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| **Test Results** | | | | | |
| Dependent Variable: lnpk | | | | | |
| Source | **Sum of Squares** | **df** | **Mean Square** | **F** | **Sig.** |
| Contrast | 2.144 | 1 | 2.144 | 9.894 | .002 |
| Error | 23.833 | 110 | .217 |  |  |

MIXED lnpk BY period sequence treatment subject

/CRITERIA=DFMETHOD(SATTERTHWAITE) CIN(95) MXITER(100) MXSTEP(10) SCORING(1)

SINGULAR(0.000000000001) HCONVERGE(0, ABSOLUTE) LCONVERGE(0, ABSOLUTE) PCONVERGE(0.000001, ABSOLUTE)

/FIXED=period sequence treatment | SSTYPE(3)

/METHOD=REML

/RANDOM= subject(sequence) | COVTYPE(ID)

/EMMEANS=TABLES(treatment) COMPARE REFCAT(FIRST) ADJ(LSD).

Mixed Model Analysis

|  |  |  |
| --- | --- | --- |
| **Notes** | | |
| Output Created | | 28-FEB-2021 17:55:03 |
| Comments | |  |
| Input | Active Dataset | pkdataset |
| Filter | <none> |
| Weight | <none> |
| Split File | <none> |
| N of Rows in Working Data File | 152 |
| Missing Value Handling | Definition of Missing | User-defined missing values are treated as missing. |
| Cases Used | Statistics are based on all cases with valid data for all variables in the model. |
| Syntax | | MIXED lnpk BY period sequence treatment subject  /CRITERIA=DFMETHOD(SATTERTHWAITE) CIN(95) MXITER(100) MXSTEP(10) SCORING(1)  SINGULAR(0.000000000001) HCONVERGE(0, ABSOLUTE) LCONVERGE(0, ABSOLUTE) PCONVERGE(0.000001, ABSOLUTE)  /FIXED=period sequence treatment | SSTYPE(3)  /METHOD=REML  /RANDOM= subject(sequence) | COVTYPE(ID)  /EMMEANS=TABLES(treatment) COMPARE REFCAT(FIRST) ADJ(LSD). |
| Resources | Processor Time | 00:00:00.03 |
| Elapsed Time | 00:00:00.04 |

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| **Model Dimension1** | | | | |
|  | | **Number of Levels** | **Covariance Structure** | **Number of Parameters** |
| Fixed Effects | Intercept | 1 |  | 1 |
| period | 4 |  | 3 |
| sequence | 2 |  | 1 |
| treatment | 2 |  | 1 |
| Random Effects | subject(sequence) | 38 | Identity | 1 |
| Residual | |  |  | 1 |
| Total | | 47 |  | 8 |

|  |
| --- |
| 1. Dependent Variable: lnpk. |

|  |  |
| --- | --- |
| **Information Criteria1** | |
| -2 Restricted Log Likelihood | 326.53614304 |
| Akaike's Information Criterion (AIC) | 330.53614304 |
| Hurvich and Tsai's Criterion (AICC) | 330.62005912 |
| Bozdogan's Criterion (CAIC) | 338.50335628 |
| Schwarz's Bayesian Criterion (BIC) | 336.50335628 |

|  |
| --- |
| The information criteria are displayed in smaller-is-better form.1 |
| 1. Dependent Variable: lnpk. |

Fixed Effects

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| **Type III Tests of Fixed Effects1** | | | | |
| Source | **Numerator df** | **Denominator df** | **F** | **Sig.** |
| Intercept | 1 | 36.000 | 12.335 | .001 |
| period | 3 | 110 | 2.828 | .042 |
| sequence | 1 | 36.000 | .409 | .527 |
| treatment | 1 | 110.000 | 9.894 | .002 |

|  |
| --- |
| 1. Dependent Variable: lnpk. |

Covariance Parameters

|  |  |  |  |
| --- | --- | --- | --- |
| **Estimates of Covariance Parameters1** | | | |
| Parameter | | **Estimate** | **Std. Error** |
| Residual | | .216665 | .029215 |
| subject(sequence) | Variance | 1.219685 | .300338 |

|  |
| --- |
| 1. Dependent Variable: lnpk. |

Estimated Marginal Means

treatment

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| **Estimates1** | | | | | |
| treatment | **Mean** | **Std. Error** | **df** | **95% Confidence Interval** | |
| **Lower Bound** | **Upper Bound** |
| R | -.525 | .187 | 39.104 | -.904 | -.146 |
| T | -.763 | .187 | 39.104 | -1.141 | -.384 |

|  |
| --- |
| 1. Dependent Variable: lnpk. |

|  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- |
| **Pairwise Comparisons1** | | | | | | |
| (I) treatment | (J) treatment | **Mean Difference (I-J)** | **Std. Error** | **df** | **Sig.3** | **95% Confidence Interval for Difference3** |
| **Lower Bound** |
| T | R | -.23783924\* | .07561455 | 110.00000000 | .00213341 | -.38768954 |

|  |  |  |
| --- | --- | --- |
| **Pairwise Comparisons1** | | |
| (I) treatment | (J) treatment | 95% Confidence Interval for Difference |
| **Upper Bound** |
| T | R | -.08798894 |

|  |
| --- |
| Based on estimated marginal means1 |
| \*. The mean difference is significant at the .05 level. |
| 1. Dependent Variable: lnpk. |
| 3. Adjustment for multiple comparisons: Least Significant Difference (equivalent to no adjustments). |

|  |  |  |  |
| --- | --- | --- | --- |
| **Univariate Tests1** | | | |
| **Numerator df** | **Denominator df** | **F** | **Sig.** |
| 1 | 110.000 | 9.894 | .002 |

|  |
| --- |
| The F tests the effect of treatment. This test is based on the linearly independent pairwise comparisons among the estimated marginal means.1 |
| 1. Dependent Variable: lnpk. |

MIXED lnpk BY period treatment sequence subject

/CRITERIA=CIN(90) MXITER(200) MXSTEP(20) SCORING(2) SINGULAR(0.000000000001) HCONVERGE(0,

RELATIVE) LCONVERGE(0.0000000000001, RELATIVE) PCONVERGE(0, RELATIVE)

/FIXED=period treatment sequence | SSTYPE(3)

/METHOD=REML

/RANDOM=treatment | SUBJECT(subject) COVTYPE(CSH)

/REPEATED=treatment | SUBJECT(subject\*period) COVTYPE(DIAG)

/EMMEANS=TABLES(treatment) COMPARE REFCAT(FIRST) ADJ(LSD).

Mixed Model Analysis

|  |  |  |
| --- | --- | --- |
| **Notes** | | |
| Output Created | | 28-FEB-2021 17:55:03 |
| Comments | |  |
| Input | Active Dataset | pkdataset |
| Filter | <none> |
| Weight | <none> |
| Split File | <none> |
| N of Rows in Working Data File | 152 |
| Missing Value Handling | Definition of Missing | User-defined missing values are treated as missing. |
| Cases Used | Statistics are based on all cases with valid data for all variables in the model. |
| Syntax | | MIXED lnpk BY period treatment sequence subject  /CRITERIA=CIN(90) MXITER(200) MXSTEP(20) SCORING(2) SINGULAR(0.000000000001) HCONVERGE(0,  RELATIVE) LCONVERGE(0.0000000000001, RELATIVE) PCONVERGE(0, RELATIVE)  /FIXED=period treatment sequence | SSTYPE(3)  /METHOD=REML  /RANDOM=treatment | SUBJECT(subject) COVTYPE(CSH)  /REPEATED=treatment | SUBJECT(subject\*period) COVTYPE(DIAG)  /EMMEANS=TABLES(treatment) COMPARE REFCAT(FIRST) ADJ(LSD). |
| Resources | Processor Time | 00:00:00.09 |
| Elapsed Time | 00:00:00.10 |

|  |
| --- |
| **Warnings** |
| The final Hessian matrix is not positive definite although all convergence criteria are satisfied. The MIXED procedure continues despite this warning. Validity of subsequent results cannot be ascertained. |

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| **Model Dimension1** | | | | | |
|  | | **Number of Levels** | **Covariance Structure** | **Number of Parameters** | **Subject Variables** |
| Fixed Effects | Intercept | 1 |  | 1 |  |
| period | 4 |  | 3 |  |
| treatment | 2 |  | 1 |  |
| sequence | 2 |  | 1 |  |
| Random Effects | treatment | 2 | Heterogeneous Compound Symmetry | 3 | subject |
| Repeated Effects | treatment | 2 | Diagonal | 2 | subject \* period |
| Total | | 13 |  | 11 |  |

|  |  |  |
| --- | --- | --- |
| **Model Dimension1** | | |
|  | | **Number of Subjects** |
| Fixed Effects | Intercept |  |
| period |  |
| treatment |  |
| sequence |  |
| Random Effects | treatment |  |
| Repeated Effects | treatment | 152 |
| Total | |  |

|  |
| --- |
| 1. Dependent Variable: lnpk. |

|  |  |
| --- | --- |
| **Information Criteria1** | |
| -2 Restricted Log Likelihood | 323.99766668 |
| Akaike's Information Criterion (AIC) | 333.99766668 |
| Hurvich and Tsai's Criterion (AICC) | 334.42623811 |
| Bozdogan's Criterion (CAIC) | 353.91569979 |
| Schwarz's Bayesian Criterion (BIC) | 348.91569979 |

|  |
| --- |
| The information criteria are displayed in smaller-is-better form.1 |
| 1. Dependent Variable: lnpk. |

Fixed Effects

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| **Type III Tests of Fixed Effects1** | | | | |
| Source | **Numerator df** | **Denominator df** | **F** | **Sig.** |
| Intercept | 1 | 33.811 | 12.334 | .001 |
| period | 3 | 114.574 | 2.892 | .038 |
| treatment | 1 | 124.833 | 9.448 | .003 |
| sequence | 1 | 33.811 | .409 | .527 |

|  |
| --- |
| 1. Dependent Variable: lnpk. |

Covariance Parameters

|  |  |  |  |
| --- | --- | --- | --- |
| **Estimates of Covariance Parameters1** | | | |
| Parameter | | **Estimate** | **Std. Error** |
| Repeated Measures | Var: [treatment=R] | .211 | .044 |
| Var: [treatment=T] | .212 | .043 |
| treatment [subject = subject] | Var: [treatment=R] | 1.362 | .346 |
| Var: [treatment=T] | 1.088 | .281 |
| CSH rho | 1.0002 | .000 |

|  |
| --- |
| 1. Dependent Variable: lnpk. |
| 2. This covariance parameter is redundant. |

Estimated Marginal Means

treatment

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| **Estimates1** | | | | | |
| treatment | **Mean** | **Std. Error** | **df** | **90% Confidence Interval** | |
| **Lower Bound** | **Upper Bound** |
| R | -.525 | .197 | 36.055 | -.857 | -.193 |
| T | -.763 | .177 | 37.144 | -1.062 | -.463 |

|  |
| --- |
| 1. Dependent Variable: lnpk. |

|  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- |
| **Pairwise Comparisons1** | | | | | | |
| (I) treatment | (J) treatment | **Mean Difference (I-J)** | **Std. Error** | **df** | **Sig.3** | **90% Confidence Interval for Difference3** |
| **Lower Bound** |
| T | R | -.23783924\* | .07737694 | 124.83327907 | .00259633 | -.36606456 |

|  |  |  |
| --- | --- | --- |
| **Pairwise Comparisons1** | | |
| (I) treatment | (J) treatment | 90% Confidence Interval for Difference |
| **Upper Bound** |
| T | R | -.10961391 |

|  |
| --- |
| Based on estimated marginal means1 |
| \*. The mean difference is significant at the .10 level. |
| 1. Dependent Variable: lnpk. |
| 3. Adjustment for multiple comparisons: Least Significant Difference (equivalent to no adjustments). |

|  |  |  |  |
| --- | --- | --- | --- |
| **Univariate Tests1** | | | |
| **Numerator df** | **Denominator df** | **F** | **Sig.** |
| 1 | 124.833 | 9.448 | .003 |

|  |
| --- |
| The F tests the effect of treatment. This test is based on the linearly independent pairwise comparisons among the estimated marginal means.1 |
| 1. Dependent Variable: lnpk. |

DATASET CLOSE pkdataset.

TITLE "RDS17".

RDS17

GET DATA

/TYPE=XLSX

/FILE='.\rds01.xlsx'

/SHEET=name 'rds17'

/CELLRANGE=FULL

/READNAMES=ON

/LEADINGSPACES IGNORE=YES

/TRAILINGSPACES IGNORE=YES

/DATATYPEMIN PERCENTAGE=95.0

/HIDDEN IGNORE=YES.

EXECUTE.

DATASET NAME pkdataset WINDOW=FRONT.

COMPUTE lnpk=ln(PK).

EXECUTE.

UNIANOVA lnpk BY period sequence treatment subject

/RANDOM subject

/CONTRAST(treatment)=Simple(1)

/METHOD=SSTYPE(3)

/INTERCEPT=INCLUDE

/CRITERIA=ALPHA(0.05)

/DESIGN=period sequence treatment subject(sequence).

Univariate Analysis of Variance

|  |  |  |
| --- | --- | --- |
| **Notes** | | |
| Output Created | | 28-FEB-2021 17:55:04 |
| Comments | |  |
| Input | Active Dataset | pkdataset |
| Filter | <none> |
| Weight | <none> |
| Split File | <none> |
| N of Rows in Working Data File | 56 |
| Missing Value Handling | Definition of Missing | User-defined missing values are treated as missing. |
| Cases Used | Statistics are based on all cases with valid data for all variables in the model. |
| Syntax | | UNIANOVA lnpk BY period sequence treatment subject  /RANDOM subject  /CONTRAST(treatment)=Simple(1)  /METHOD=SSTYPE(3)  /INTERCEPT=INCLUDE  /CRITERIA=ALPHA(0.05)  /DESIGN=period sequence treatment subject(sequence). |
| Resources | Processor Time | 00:00:00.02 |
| Elapsed Time | 00:00:00.01 |

|  |  |  |
| --- | --- | --- |
| **Between-Subjects Factors** | | |
|  | | **N** |
| period | 1 | 19 |
| 2 | 19 |
| 3 | 18 |
| sequence | RTR | 36 |
| TRT | 20 |
| treatment | R | 31 |
| T | 25 |
| subject | 1 | 3 |
| 2 | 3 |
| 3 | 3 |
| 4 | 3 |
| 5 | 3 |
| 6 | 3 |
| 7 | 3 |
| 8 | 3 |
| 9 | 3 |
| 10 | 3 |
| 11 | 2 |
| 12 | 3 |
| 13 | 3 |
| 14 | 3 |
| 16 | 3 |
| 18 | 3 |
| 19 | 3 |
| 21 | 3 |
| 22 | 3 |

|  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- |
| **Tests of Between-Subjects Effects** | | | | | | |
| Dependent Variable: lnpk | | | | | | |
| Source | | **Type III Sum of Squares** | **df** | **Mean Square** | **F** | **Sig.** |
| Intercept | Hypothesis | 3021.733 | 1 | 3021.733 | 2392.711 | .000 |
| Error | 21.548 | 17.063 | 1.2631 |  |  |
| period | Hypothesis | .049 | 2 | .024 | .286 | .753 |
| Error | 2.896 | 34 | .0852 |  |  |
| sequence | Hypothesis | .236 | 1 | .236 | .204 | .657 |
| Error | 19.986 | 17.293 | 1.1563 |  |  |
| treatment | Hypothesis | .995 | 1 | .995 | 11.682 | .002 |
| Error | 2.896 | 34 | .0852 |  |  |
| subject(sequence) | Hypothesis | 22.031 | 17 | 1.296 | 15.214 | .000 |
| Error | 2.896 | 34 | .0852 |  |  |

|  |
| --- |
| 1. .973 MS(subject(sequence)) + .027 MS(Error) |
| 2. MS(Error) |
| 3. .884 MS(subject(sequence)) + .116 MS(Error) |

|  |  |  |  |
| --- | --- | --- | --- |
| **Expected Mean Squares1,2** | | | |
| Source | **Variance Component** | | |
| **Var(subject(sequence))** | **Var(Error)** | **Quadratic Term** |
| Intercept | 2.864 | 1.000 | Intercept, period, sequence, treatment |
| period | .000 | 1.000 | period |
| sequence | 2.603 | 1.000 | sequence |
| treatment | .000 | 1.000 | treatment |
| subject(sequence) | 2.944 | 1.000 |  |
| Error | .000 | 1.000 |  |

|  |
| --- |
| 1. For each source, the expected mean square equals the sum of the coefficients in the cells times the variance components, plus a quadratic term involving effects in the Quadratic Term cell. |
| 2. Expected Mean Squares are based on the Type III Sums of Squares. |

Custom Hypothesis Tests

|  |  |  |  |
| --- | --- | --- | --- |
| **Contrast Results (K Matrix)** | | | |
| treatment Simple Contrast1 | | | **Dependent Variable** |
| **lnpk** |
| Level 2 vs. Level 1 | Contrast Estimate | | .294 |
| Hypothesized Value | | 0 |
| Difference (Estimate - Hypothesized) | | .294 |
| Std. Error | | .086 |
| Sig. | | .002 |
| 95% Confidence Interval for Difference | Lower Bound | .119 |
| Upper Bound | .469 |

|  |
| --- |
| 1. Reference category = 1 |

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| **Test Results** | | | | | |
| Dependent Variable: lnpk | | | | | |
| Source | **Sum of Squares** | **df** | **Mean Square** | **F** | **Sig.** |
| Contrast | .995 | 1 | .995 | 11.682 | .002 |
| Error | 2.896 | 34 | .085 |  |  |

MIXED lnpk BY period sequence treatment subject

/CRITERIA=DFMETHOD(SATTERTHWAITE) CIN(95) MXITER(100) MXSTEP(10) SCORING(1)

SINGULAR(0.000000000001) HCONVERGE(0, ABSOLUTE) LCONVERGE(0, ABSOLUTE) PCONVERGE(0.000001, ABSOLUTE)

/FIXED=period sequence treatment | SSTYPE(3)

/METHOD=REML

/RANDOM= subject(sequence) | COVTYPE(ID)

/EMMEANS=TABLES(treatment) COMPARE REFCAT(FIRST) ADJ(LSD).

Mixed Model Analysis

|  |  |  |
| --- | --- | --- |
| **Notes** | | |
| Output Created | | 28-FEB-2021 17:55:04 |
| Comments | |  |
| Input | Active Dataset | pkdataset |
| Filter | <none> |
| Weight | <none> |
| Split File | <none> |
| N of Rows in Working Data File | 56 |
| Missing Value Handling | Definition of Missing | User-defined missing values are treated as missing. |
| Cases Used | Statistics are based on all cases with valid data for all variables in the model. |
| Syntax | | MIXED lnpk BY period sequence treatment subject  /CRITERIA=DFMETHOD(SATTERTHWAITE) CIN(95) MXITER(100) MXSTEP(10) SCORING(1)  SINGULAR(0.000000000001) HCONVERGE(0, ABSOLUTE) LCONVERGE(0, ABSOLUTE) PCONVERGE(0.000001, ABSOLUTE)  /FIXED=period sequence treatment | SSTYPE(3)  /METHOD=REML  /RANDOM= subject(sequence) | COVTYPE(ID)  /EMMEANS=TABLES(treatment) COMPARE REFCAT(FIRST) ADJ(LSD). |
| Resources | Processor Time | 00:00:00.00 |
| Elapsed Time | 00:00:00.02 |

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| **Model Dimension1** | | | | |
|  | | **Number of Levels** | **Covariance Structure** | **Number of Parameters** |
| Fixed Effects | Intercept | 1 |  | 1 |
| period | 3 |  | 2 |
| sequence | 2 |  | 1 |
| treatment | 2 |  | 1 |
| Random Effects | subject(sequence) | 19 | Identity | 1 |
| Residual | |  |  | 1 |
| Total | | 27 |  | 7 |

|  |
| --- |
| 1. Dependent Variable: lnpk. |

|  |  |
| --- | --- |
| **Information Criteria1** | |
| -2 Restricted Log Likelihood | 78.84472798 |
| Akaike's Information Criterion (AIC) | 82.84472798 |
| Hurvich and Tsai's Criterion (AICC) | 83.09472798 |
| Bozdogan's Criterion (CAIC) | 88.70837924 |
| Schwarz's Bayesian Criterion (BIC) | 86.70837924 |

|  |
| --- |
| The information criteria are displayed in smaller-is-better form.1 |
| 1. Dependent Variable: lnpk. |

Fixed Effects

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| **Type III Tests of Fixed Effects1** | | | | |
| Source | **Numerator df** | **Denominator df** | **F** | **Sig.** |
| Intercept | 1 | 17.098 | 2397.273 | .000 |
| period | 2 | 34.116 | .288 | .752 |
| sequence | 1 | 17.332 | .205 | .656 |
| treatment | 1 | 34.101 | 11.657 | .002 |

|  |
| --- |
| 1. Dependent Variable: lnpk. |

Covariance Parameters

|  |  |  |  |
| --- | --- | --- | --- |
| **Estimates of Covariance Parameters1** | | | |
| Parameter | | **Estimate** | **Std. Error** |
| Residual | | .085109 | .020625 |
| subject(sequence) | Variance | .404733 | .148722 |

|  |
| --- |
| 1. Dependent Variable: lnpk. |

Estimated Marginal Means

treatment

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| **Estimates1** | | | | | |
| treatment | **Mean** | **Std. Error** | **df** | **95% Confidence Interval** | |
| **Lower Bound** | **Upper Bound** |
| R | 7.527 | .162 | 19.545 | 7.189 | 7.866 |
| T | 7.821 | .163 | 19.860 | 7.481 | 8.161 |

|  |
| --- |
| 1. Dependent Variable: lnpk. |

|  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- |
| **Pairwise Comparisons1** | | | | | | |
| (I) treatment | (J) treatment | **Mean Difference (I-J)** | **Std. Error** | **df** | **Sig.3** | **95% Confidence Interval for Difference3** |
| **Lower Bound** |
| T | R | .29350244\* | .08596489 | 34.10121258 | .00166665 | .11881987 |

|  |  |  |
| --- | --- | --- |
| **Pairwise Comparisons1** | | |
| (I) treatment | (J) treatment | 95% Confidence Interval for Difference |
| **Upper Bound** |
| T | R | .46818502 |

|  |
| --- |
| Based on estimated marginal means1 |
| \*. The mean difference is significant at the .05 level. |
| 1. Dependent Variable: lnpk. |
| 3. Adjustment for multiple comparisons: Least Significant Difference (equivalent to no adjustments). |

|  |  |  |  |
| --- | --- | --- | --- |
| **Univariate Tests1** | | | |
| **Numerator df** | **Denominator df** | **F** | **Sig.** |
| 1 | 34.101 | 11.657 | .002 |

|  |
| --- |
| The F tests the effect of treatment. This test is based on the linearly independent pairwise comparisons among the estimated marginal means.1 |
| 1. Dependent Variable: lnpk. |

MIXED lnpk BY period treatment sequence subject

/CRITERIA=CIN(90) MXITER(200) MXSTEP(20) SCORING(2) SINGULAR(0.000000000001) HCONVERGE(0,

RELATIVE) LCONVERGE(0.0000000000001, RELATIVE) PCONVERGE(0, RELATIVE)

/FIXED=period treatment sequence | SSTYPE(3)

/METHOD=REML

/RANDOM=treatment | SUBJECT(subject) COVTYPE(CSH)

/REPEATED=treatment | SUBJECT(subject\*period) COVTYPE(DIAG)

/EMMEANS=TABLES(treatment) COMPARE REFCAT(FIRST) ADJ(LSD).

Mixed Model Analysis

|  |  |  |
| --- | --- | --- |
| **Notes** | | |
| Output Created | | 28-FEB-2021 17:55:04 |
| Comments | |  |
| Input | Active Dataset | pkdataset |
| Filter | <none> |
| Weight | <none> |
| Split File | <none> |
| N of Rows in Working Data File | 56 |
| Missing Value Handling | Definition of Missing | User-defined missing values are treated as missing. |
| Cases Used | Statistics are based on all cases with valid data for all variables in the model. |
| Syntax | | MIXED lnpk BY period treatment sequence subject  /CRITERIA=CIN(90) MXITER(200) MXSTEP(20) SCORING(2) SINGULAR(0.000000000001) HCONVERGE(0,  RELATIVE) LCONVERGE(0.0000000000001, RELATIVE) PCONVERGE(0, RELATIVE)  /FIXED=period treatment sequence | SSTYPE(3)  /METHOD=REML  /RANDOM=treatment | SUBJECT(subject) COVTYPE(CSH)  /REPEATED=treatment | SUBJECT(subject\*period) COVTYPE(DIAG)  /EMMEANS=TABLES(treatment) COMPARE REFCAT(FIRST) ADJ(LSD). |
| Resources | Processor Time | 00:00:00.03 |
| Elapsed Time | 00:00:00.13 |

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| **Model Dimension1** | | | | | |
|  | | **Number of Levels** | **Covariance Structure** | **Number of Parameters** | **Subject Variables** |
| Fixed Effects | Intercept | 1 |  | 1 |  |
| period | 3 |  | 2 |  |
| treatment | 2 |  | 1 |  |
| sequence | 2 |  | 1 |  |
| Random Effects | treatment | 2 | Heterogeneous Compound Symmetry | 3 | subject |
| Repeated Effects | treatment | 2 | Diagonal | 2 | subject \* period |
| Total | | 12 |  | 10 |  |

|  |  |  |
| --- | --- | --- |
| **Model Dimension1** | | |
|  | | **Number of Subjects** |
| Fixed Effects | Intercept |  |
| period |  |
| treatment |  |
| sequence |  |
| Random Effects | treatment |  |
| Repeated Effects | treatment | 56 |
| Total | |  |

|  |
| --- |
| 1. Dependent Variable: lnpk. |

|  |  |
| --- | --- |
| **Information Criteria1** | |
| -2 Restricted Log Likelihood | 77.56902301 |
| Akaike's Information Criterion (AIC) | 87.56902301 |
| Hurvich and Tsai's Criterion (AICC) | 88.90235635 |
| Bozdogan's Criterion (CAIC) | 102.22815118 |
| Schwarz's Bayesian Criterion (BIC) | 97.22815118 |

|  |
| --- |
| The information criteria are displayed in smaller-is-better form.1 |
| 1. Dependent Variable: lnpk. |

Fixed Effects

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| **Type III Tests of Fixed Effects1** | | | | |
| Source | **Numerator df** | **Denominator df** | **F** | **Sig.** |
| Intercept | 1 | 17.101 | 2297.036 | .000 |
| period | 2 | 32.693 | .297 | .745 |
| treatment | 1 | 18.362 | 9.327 | .007 |
| sequence | 1 | 17.241 | .205 | .657 |

|  |
| --- |
| 1. Dependent Variable: lnpk. |

Covariance Parameters

|  |  |  |  |
| --- | --- | --- | --- |
| **Estimates of Covariance Parameters1** | | | |
| Parameter | | **Estimate** | **Std. Error** |
| Repeated Measures | Var: [treatment=R] | .078 | .030 |
| Var: [treatment=T] | .042 | .027 |
| treatment [subject = subject] | Var: [treatment=R] | .398 | .152 |
| Var: [treatment=T] | .492 | .185 |
| CSH rho | .925 | .069 |

|  |
| --- |
| 1. Dependent Variable: lnpk. |

Estimated Marginal Means

treatment

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| **Estimates1** | | | | | |
| treatment | **Mean** | **Std. Error** | **df** | **90% Confidence Interval** | |
| **Lower Bound** | **Upper Bound** |
| R | 7.528 | .161 | 18.314 | 7.250 | 7.806 |
| T | 7.823 | .174 | 16.288 | 7.520 | 8.126 |

|  |
| --- |
| 1. Dependent Variable: lnpk. |

|  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- |
| **Pairwise Comparisons1** | | | | | | |
| (I) treatment | (J) treatment | **Mean Difference (I-J)** | **Std. Error** | **df** | **Sig.3** | **90% Confidence Interval for Difference3** |
| **Lower Bound** |
| T | R | .29537052\* | .09671454 | 18.36186062 | .00671810 | .12784023 |

|  |  |  |
| --- | --- | --- |
| **Pairwise Comparisons1** | | |
| (I) treatment | (J) treatment | 90% Confidence Interval for Difference |
| **Upper Bound** |
| T | R | .46290081 |

|  |
| --- |
| Based on estimated marginal means1 |
| \*. The mean difference is significant at the .10 level. |
| 1. Dependent Variable: lnpk. |
| 3. Adjustment for multiple comparisons: Least Significant Difference (equivalent to no adjustments). |

|  |  |  |  |
| --- | --- | --- | --- |
| **Univariate Tests1** | | | |
| **Numerator df** | **Denominator df** | **F** | **Sig.** |
| 1 | 18.362 | 9.327 | .007 |

|  |
| --- |
| The F tests the effect of treatment. This test is based on the linearly independent pairwise comparisons among the estimated marginal means.1 |
| 1. Dependent Variable: lnpk. |

DATASET CLOSE pkdataset.

TITLE "RDS18".

RDS18

GET DATA

/TYPE=XLSX

/FILE='.\rds01.xlsx'

/SHEET=name 'rds18'

/CELLRANGE=FULL

/READNAMES=ON

/LEADINGSPACES IGNORE=YES

/TRAILINGSPACES IGNORE=YES

/DATATYPEMIN PERCENTAGE=95.0

/HIDDEN IGNORE=YES.

EXECUTE.

DATASET NAME pkdataset WINDOW=FRONT.

COMPUTE lnpk=ln(PK).

EXECUTE.

UNIANOVA lnpk BY period sequence treatment subject

/RANDOM subject

/CONTRAST(treatment)=Simple(1)

/METHOD=SSTYPE(3)

/INTERCEPT=INCLUDE

/CRITERIA=ALPHA(0.05)

/DESIGN=period sequence treatment subject(sequence).

Univariate Analysis of Variance

|  |  |  |
| --- | --- | --- |
| **Notes** | | |
| Output Created | | 28-FEB-2021 17:55:05 |
| Comments | |  |
| Input | Active Dataset | pkdataset |
| Filter | <none> |
| Weight | <none> |
| Split File | <none> |
| N of Rows in Working Data File | 245 |
| Missing Value Handling | Definition of Missing | User-defined missing values are treated as missing. |
| Cases Used | Statistics are based on all cases with valid data for all variables in the model. |
| Syntax | | UNIANOVA lnpk BY period sequence treatment subject  /RANDOM subject  /CONTRAST(treatment)=Simple(1)  /METHOD=SSTYPE(3)  /INTERCEPT=INCLUDE  /CRITERIA=ALPHA(0.05)  /DESIGN=period sequence treatment subject(sequence). |
| Resources | Processor Time | 00:00:00.03 |
| Elapsed Time | 00:00:00.06 |

|  |  |  |
| --- | --- | --- |
| **Between-Subjects Factors** | | |
|  | | **N** |
| period | 1 | 69 |
| 2 | 65 |
| 3 | 59 |
| 4 | 52 |
| sequence | RTRT | 121 |
| TRTR | 124 |
| treatment | R | 138 |
| T | 107 |
| subject | 1 | 4 |
| 2 | 3 |
| 3 | 3 |
| 4 | 4 |
| 5 | 4 |
| 6 | 3 |
| 7 | 4 |
| 8 | 4 |
| 9 | 4 |
| 10 | 4 |
| 11 | 3 |
| 12 | 4 |
| 13 | 4 |
| 14 | 4 |
| 15 | 4 |
| 16 | 4 |
| 17 | 4 |
| 18 | 3 |
| 19 | 3 |
| 20 | 3 |
| 21 | 4 |
| 22 | 3 |
| 23 | 3 |
| 24 | 3 |
| 25 | 4 |
| 26 | 4 |
| 27 | 3 |
| 28 | 4 |
| 29 | 3 |
| 30 | 4 |
| 31 | 3 |
| 32 | 4 |
| 33 | 4 |
| 34 | 2 |
| 35 | 3 |
| 36 | 4 |
| 37 | 4 |
| 38 | 4 |
| 39 | 4 |
| 40 | 4 |
| 41 | 4 |
| 42 | 3 |
| 43 | 2 |
| 44 | 4 |
| 45 | 3 |
| 46 | 3 |
| 47 | 4 |
| 48 | 4 |
| 49 | 4 |
| 50 | 4 |
| 51 | 4 |
| 52 | 2 |
| 53 | 4 |
| 54 | 4 |
| 55 | 4 |
| 56 | 1 |
| 57 | 3 |
| 58 | 4 |
| 59 | 3 |
| 60 | 4 |
| 62 | 4 |
| 63 | 2 |
| 64 | 2 |
| 65 | 2 |
| 66 | 1 |
| 67 | 1 |
| 68 | 2 |
| 69 | 2 |
| 70 | 2 |
| 71 | 1 |
| 72 | 2 |
| 73 | 2 |
| 74 | 2 |
| 75 | 2 |
| 76 | 2 |
| 77 | 2 |
| 78 | 2 |

|  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- |
| **Tests of Between-Subjects Effects** | | | | | | |
| Dependent Variable: lnpk | | | | | | |
| Source | | **Type III Sum of Squares** | **df** | **Mean Square** | **F** | **Sig.** |
| Intercept | Hypothesis | 12.804 | 1 | 12.804 | 2.203 | .141 |
| Error | 487.742 | 83.917 | 5.8121 |  |  |
| period | Hypothesis | .908 | 3 | .303 | .172 | .915 |
| Error | 288.141 | 164 | 1.7572 |  |  |
| sequence | Hypothesis | 2.405 | 1 | 2.405 | .407 | .525 |
| Error | 488.976 | 82.856 | 5.9023 |  |  |
| treatment | Hypothesis | 4.981 | 1 | 4.981 | 2.835 | .094 |
| Error | 288.141 | 164 | 1.7572 |  |  |
| subject(sequence) | Hypothesis | 504.107 | 75 | 6.721 | 3.826 | .000 |
| Error | 288.141 | 164 | 1.7572 |  |  |

|  |
| --- |
| 1. .817 MS(subject(sequence)) + .183 MS(Error) |
| 2. MS(Error) |
| 3. .835 MS(subject(sequence)) + .165 MS(Error) |

|  |  |  |  |
| --- | --- | --- | --- |
| **Expected Mean Squares1,2** | | | |
| Source | **Variance Component** | | |
| **Var(subject(sequence))** | **Var(Error)** | **Quadratic Term** |
| Intercept | 2.584 | 1.000 | Intercept, period, sequence, treatment |
| period | .000 | 1.000 | period |
| sequence | 2.641 | 1.000 | sequence |
| treatment | .000 | 1.000 | treatment |
| subject(sequence) | 3.163 | 1.000 |  |
| Error | .000 | 1.000 |  |

|  |
| --- |
| 1. For each source, the expected mean square equals the sum of the coefficients in the cells times the variance components, plus a quadratic term involving effects in the Quadratic Term cell. |
| 2. Expected Mean Squares are based on the Type III Sums of Squares. |

Custom Hypothesis Tests

|  |  |  |  |
| --- | --- | --- | --- |
| **Contrast Results (K Matrix)** | | | |
| treatment Simple Contrast1 | | | **Dependent Variable** |
| **lnpk** |
| Level 2 vs. Level 1 | Contrast Estimate | | -.309 |
| Hypothesized Value | | 0 |
| Difference (Estimate - Hypothesized) | | -.309 |
| Std. Error | | .184 |
| Sig. | | .094 |
| 95% Confidence Interval for Difference | Lower Bound | -.672 |
| Upper Bound | .053 |

|  |
| --- |
| 1. Reference category = 1 |

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| **Test Results** | | | | | |
| Dependent Variable: lnpk | | | | | |
| Source | **Sum of Squares** | **df** | **Mean Square** | **F** | **Sig.** |
| Contrast | 4.981 | 1 | 4.981 | 2.835 | .094 |
| Error | 288.141 | 164 | 1.757 |  |  |

MIXED lnpk BY period sequence treatment subject

/CRITERIA=DFMETHOD(SATTERTHWAITE) CIN(95) MXITER(100) MXSTEP(10) SCORING(1)

SINGULAR(0.000000000001) HCONVERGE(0, ABSOLUTE) LCONVERGE(0, ABSOLUTE) PCONVERGE(0.000001, ABSOLUTE)

/FIXED=period sequence treatment | SSTYPE(3)

/METHOD=REML

/RANDOM= subject(sequence) | COVTYPE(ID)

/EMMEANS=TABLES(treatment) COMPARE REFCAT(FIRST) ADJ(LSD).

Mixed Model Analysis

|  |  |  |
| --- | --- | --- |
| **Notes** | | |
| Output Created | | 28-FEB-2021 17:55:05 |
| Comments | |  |
| Input | Active Dataset | pkdataset |
| Filter | <none> |
| Weight | <none> |
| Split File | <none> |
| N of Rows in Working Data File | 245 |
| Missing Value Handling | Definition of Missing | User-defined missing values are treated as missing. |
| Cases Used | Statistics are based on all cases with valid data for all variables in the model. |
| Syntax | | MIXED lnpk BY period sequence treatment subject  /CRITERIA=DFMETHOD(SATTERTHWAITE) CIN(95) MXITER(100) MXSTEP(10) SCORING(1)  SINGULAR(0.000000000001) HCONVERGE(0, ABSOLUTE) LCONVERGE(0, ABSOLUTE) PCONVERGE(0.000001, ABSOLUTE)  /FIXED=period sequence treatment | SSTYPE(3)  /METHOD=REML  /RANDOM= subject(sequence) | COVTYPE(ID)  /EMMEANS=TABLES(treatment) COMPARE REFCAT(FIRST) ADJ(LSD). |
| Resources | Processor Time | 00:00:00.19 |
| Elapsed Time | 00:00:00.32 |

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| **Model Dimension1** | | | | |
|  | | **Number of Levels** | **Covariance Structure** | **Number of Parameters** |
| Fixed Effects | Intercept | 1 |  | 1 |
| period | 4 |  | 3 |
| sequence | 2 |  | 1 |
| treatment | 2 |  | 1 |
| Random Effects | subject(sequence) | 77 | Identity | 1 |
| Residual | |  |  | 1 |
| Total | | 86 |  | 8 |

|  |
| --- |
| 1. Dependent Variable: lnpk. |

|  |  |
| --- | --- |
| **Information Criteria1** | |
| -2 Restricted Log Likelihood | 937.98558675 |
| Akaike's Information Criterion (AIC) | 941.98558675 |
| Hurvich and Tsai's Criterion (AICC) | 942.03643420 |
| Bozdogan's Criterion (CAIC) | 950.93851385 |
| Schwarz's Bayesian Criterion (BIC) | 948.93851385 |

|  |
| --- |
| The information criteria are displayed in smaller-is-better form.1 |
| 1. Dependent Variable: lnpk. |

Fixed Effects

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| **Type III Tests of Fixed Effects1** | | | | |
| Source | **Numerator df** | **Denominator df** | **F** | **Sig.** |
| Intercept | 1 | 73.370 | 3.638 | .060 |
| period | 3 | 171.462 | .161 | .922 |
| sequence | 1 | 72.904 | .263 | .610 |
| treatment | 1 | 177.922 | 1.605 | .207 |

|  |
| --- |
| 1. Dependent Variable: lnpk. |

Covariance Parameters

|  |  |  |  |
| --- | --- | --- | --- |
| **Estimates of Covariance Parameters1** | | | |
| Parameter | | **Estimate** | **Std. Error** |
| Residual | | 1.774418 | .196609 |
| subject(sequence) | Variance | 1.572174 | .366155 |

|  |
| --- |
| 1. Dependent Variable: lnpk. |

Estimated Marginal Means

treatment

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| **Estimates1** | | | | | |
| treatment | **Mean** | **Std. Error** | **df** | **95% Confidence Interval** | |
| **Lower Bound** | **Upper Bound** |
| R | .437 | .184 | 101.766 | .072 | .802 |
| T | .209 | .200 | 126.437 | -.186 | .604 |

|  |
| --- |
| 1. Dependent Variable: lnpk. |

|  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- |
| **Pairwise Comparisons1** | | | | | | |
| (I) treatment | (J) treatment | **Mean Difference (I-J)** | **Std. Error** | **df** | **Sig.2** | **95% Confidence Interval for Difference2** |
| **Lower Bound** |
| T | R | -.22791462 | .17991531 | 177.92200323 | .20688676 | -.58295711 |

|  |  |  |
| --- | --- | --- |
| **Pairwise Comparisons1** | | |
| (I) treatment | (J) treatment | 95% Confidence Interval for Difference |
| **Upper Bound** |
| T | R | .12712788 |

|  |
| --- |
| Based on estimated marginal means1 |
| 1. Dependent Variable: lnpk. |
| 2. Adjustment for multiple comparisons: Least Significant Difference (equivalent to no adjustments). |

|  |  |  |  |
| --- | --- | --- | --- |
| **Univariate Tests1** | | | |
| **Numerator df** | **Denominator df** | **F** | **Sig.** |
| 1 | 177.922 | 1.605 | .207 |

|  |
| --- |
| The F tests the effect of treatment. This test is based on the linearly independent pairwise comparisons among the estimated marginal means.1 |
| 1. Dependent Variable: lnpk. |

MIXED lnpk BY period treatment sequence subject

/CRITERIA=CIN(90) MXITER(200) MXSTEP(20) SCORING(2) SINGULAR(0.000000000001) HCONVERGE(0,

RELATIVE) LCONVERGE(0.0000000000001, RELATIVE) PCONVERGE(0, RELATIVE)

/FIXED=period treatment sequence | SSTYPE(3)

/METHOD=REML

/RANDOM=treatment | SUBJECT(subject) COVTYPE(CSH)

/REPEATED=treatment | SUBJECT(subject\*period) COVTYPE(DIAG)

/EMMEANS=TABLES(treatment) COMPARE REFCAT(FIRST) ADJ(LSD).

Mixed Model Analysis

|  |  |  |
| --- | --- | --- |
| **Notes** | | |
| Output Created | | 28-FEB-2021 17:55:05 |
| Comments | |  |
| Input | Active Dataset | pkdataset |
| Filter | <none> |
| Weight | <none> |
| Split File | <none> |
| N of Rows in Working Data File | 245 |
| Missing Value Handling | Definition of Missing | User-defined missing values are treated as missing. |
| Cases Used | Statistics are based on all cases with valid data for all variables in the model. |
| Syntax | | MIXED lnpk BY period treatment sequence subject  /CRITERIA=CIN(90) MXITER(200) MXSTEP(20) SCORING(2) SINGULAR(0.000000000001) HCONVERGE(0,  RELATIVE) LCONVERGE(0.0000000000001, RELATIVE) PCONVERGE(0, RELATIVE)  /FIXED=period treatment sequence | SSTYPE(3)  /METHOD=REML  /RANDOM=treatment | SUBJECT(subject) COVTYPE(CSH)  /REPEATED=treatment | SUBJECT(subject\*period) COVTYPE(DIAG)  /EMMEANS=TABLES(treatment) COMPARE REFCAT(FIRST) ADJ(LSD). |
| Resources | Processor Time | 00:00:00.09 |
| Elapsed Time | 00:00:00.16 |

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| **Model Dimension1** | | | | | |
|  | | **Number of Levels** | **Covariance Structure** | **Number of Parameters** | **Subject Variables** |
| Fixed Effects | Intercept | 1 |  | 1 |  |
| period | 4 |  | 3 |  |
| treatment | 2 |  | 1 |  |
| sequence | 2 |  | 1 |  |
| Random Effects | treatment | 2 | Heterogeneous Compound Symmetry | 3 | subject |
| Repeated Effects | treatment | 2 | Diagonal | 2 | subject \* period |
| Total | | 13 |  | 11 |  |

|  |  |  |
| --- | --- | --- |
| **Model Dimension1** | | |
|  | | **Number of Subjects** |
| Fixed Effects | Intercept |  |
| period |  |
| treatment |  |
| sequence |  |
| Random Effects | treatment |  |
| Repeated Effects | treatment | 245 |
| Total | |  |

|  |
| --- |
| 1. Dependent Variable: lnpk. |

|  |  |
| --- | --- |
| **Information Criteria1** | |
| -2 Restricted Log Likelihood | 904.87437996 |
| Akaike's Information Criterion (AIC) | 914.87437996 |
| Hurvich and Tsai's Criterion (AICC) | 915.13189069 |
| Bozdogan's Criterion (CAIC) | 937.25669772 |
| Schwarz's Bayesian Criterion (BIC) | 932.25669772 |

|  |
| --- |
| The information criteria are displayed in smaller-is-better form.1 |
| 1. Dependent Variable: lnpk. |

Fixed Effects

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| **Type III Tests of Fixed Effects1** | | | | |
| Source | **Numerator df** | **Denominator df** | **F** | **Sig.** |
| Intercept | 1 | 73.563 | 4.284 | .042 |
| period | 3 | 131.364 | .236 | .871 |
| treatment | 1 | 68.067 | .280 | .599 |
| sequence | 1 | 73.131 | .289 | .592 |

|  |
| --- |
| 1. Dependent Variable: lnpk. |

Covariance Parameters

|  |  |  |  |
| --- | --- | --- | --- |
| **Estimates of Covariance Parameters1** | | | |
| Parameter | | **Estimate** | **Std. Error** |
| Repeated Measures | Var: [treatment=R] | .982 | .182 |
| Var: [treatment=T] | 1.000 | .208 |
| treatment [subject = subject] | Var: [treatment=R] | 2.984 | .598 |
| Var: [treatment=T] | 1.535 | .400 |
| CSH rho | .471 | .141 |

|  |
| --- |
| 1. Dependent Variable: lnpk. |

Estimated Marginal Means

treatment

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| **Estimates1** | | | | | |
| treatment | **Mean** | **Std. Error** | **df** | **90% Confidence Interval** | |
| **Lower Bound** | **Upper Bound** |
| R | .401 | .216 | 73.317 | .041 | .761 |
| T | .277 | .185 | 63.209 | -.032 | .586 |

|  |
| --- |
| 1. Dependent Variable: lnpk. |

|  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- |
| **Pairwise Comparisons1** | | | | | | |
| (I) treatment | (J) treatment | **Mean Difference (I-J)** | **Std. Error** | **df** | **Sig.2** | **90% Confidence Interval for Difference2** |
| **Lower Bound** |
| T | R | -.12364295 | .23377578 | 68.06672907 | .59859852 | -.51347568 |

|  |  |  |
| --- | --- | --- |
| **Pairwise Comparisons1** | | |
| (I) treatment | (J) treatment | 90% Confidence Interval for Difference |
| **Upper Bound** |
| T | R | .26618979 |

|  |
| --- |
| Based on estimated marginal means1 |
| 1. Dependent Variable: lnpk. |
| 2. Adjustment for multiple comparisons: Least Significant Difference (equivalent to no adjustments). |

|  |  |  |  |
| --- | --- | --- | --- |
| **Univariate Tests1** | | | |
| **Numerator df** | **Denominator df** | **F** | **Sig.** |
| 1 | 68.067 | .280 | .599 |

|  |
| --- |
| The F tests the effect of treatment. This test is based on the linearly independent pairwise comparisons among the estimated marginal means.1 |
| 1. Dependent Variable: lnpk. |

DATASET CLOSE pkdataset.

TITLE "RDS19".

RDS19

GET DATA

/TYPE=XLSX

/FILE='.\rds01.xlsx'

/SHEET=name 'rds19'

/CELLRANGE=FULL

/READNAMES=ON

/LEADINGSPACES IGNORE=YES

/TRAILINGSPACES IGNORE=YES

/DATATYPEMIN PERCENTAGE=95.0

/HIDDEN IGNORE=YES.

EXECUTE.

DATASET NAME pkdataset WINDOW=FRONT.

COMPUTE lnpk=ln(PK).

EXECUTE.

UNIANOVA lnpk BY period sequence treatment subject

/RANDOM subject

/CONTRAST(treatment)=Simple(1)

/METHOD=SSTYPE(3)

/INTERCEPT=INCLUDE

/CRITERIA=ALPHA(0.05)

/DESIGN=period sequence treatment subject(sequence).

Univariate Analysis of Variance

|  |  |  |
| --- | --- | --- |
| **Notes** | | |
| Output Created | | 28-FEB-2021 17:55:06 |
| Comments | |  |
| Input | Active Dataset | pkdataset |
| Filter | <none> |
| Weight | <none> |
| Split File | <none> |
| N of Rows in Working Data File | 216 |
| Missing Value Handling | Definition of Missing | User-defined missing values are treated as missing. |
| Cases Used | Statistics are based on all cases with valid data for all variables in the model. |
| Syntax | | UNIANOVA lnpk BY period sequence treatment subject  /RANDOM subject  /CONTRAST(treatment)=Simple(1)  /METHOD=SSTYPE(3)  /INTERCEPT=INCLUDE  /CRITERIA=ALPHA(0.05)  /DESIGN=period sequence treatment subject(sequence). |
| Resources | Processor Time | 00:00:00.08 |
| Elapsed Time | 00:00:00.04 |

|  |  |  |
| --- | --- | --- |
| **Between-Subjects Factors** | | |
|  | | **N** |
| period | 1 | 61 |
| 2 | 57 |
| 3 | 52 |
| 4 | 46 |
| sequence | RTRT | 106 |
| TRTR | 110 |
| treatment | R | 109 |
| T | 107 |
| subject | 1 | 4 |
| 2 | 3 |
| 3 | 3 |
| 4 | 4 |
| 5 | 4 |
| 6 | 3 |
| 7 | 4 |
| 8 | 4 |
| 9 | 4 |
| 10 | 4 |
| 11 | 3 |
| 12 | 4 |
| 13 | 4 |
| 14 | 4 |
| 15 | 4 |
| 16 | 4 |
| 17 | 4 |
| 18 | 3 |
| 19 | 3 |
| 20 | 3 |
| 21 | 4 |
| 22 | 3 |
| 23 | 3 |
| 24 | 3 |
| 25 | 4 |
| 26 | 4 |
| 27 | 3 |
| 28 | 4 |
| 29 | 3 |
| 30 | 4 |
| 31 | 3 |
| 32 | 4 |
| 33 | 4 |
| 34 | 2 |
| 35 | 3 |
| 36 | 4 |
| 37 | 4 |
| 38 | 4 |
| 39 | 4 |
| 40 | 4 |
| 41 | 4 |
| 42 | 3 |
| 43 | 2 |
| 44 | 4 |
| 45 | 3 |
| 46 | 3 |
| 47 | 4 |
| 48 | 4 |
| 49 | 4 |
| 50 | 4 |
| 51 | 4 |
| 52 | 2 |
| 53 | 4 |
| 54 | 4 |
| 55 | 4 |
| 56 | 1 |
| 57 | 3 |
| 58 | 4 |
| 59 | 3 |
| 60 | 4 |
| 62 | 4 |

|  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- |
| **Tests of Between-Subjects Effects** | | | | | | |
| Dependent Variable: lnpk | | | | | | |
| Source | | **Type III Sum of Squares** | **df** | **Mean Square** | **F** | **Sig.** |
| Intercept | Hypothesis | 50.083 | 1 | 50.083 | 8.060 | .006 |
| Error | 383.666 | 61.740 | 6.2141 |  |  |
| period | Hypothesis | .361 | 3 | .120 | .067 | .977 |
| Error | 269.459 | 151 | 1.7842 |  |  |
| sequence | Hypothesis | .656 | 1 | .656 | .104 | .748 |
| Error | 384.610 | 61.163 | 6.2883 |  |  |
| treatment | Hypothesis | 4.888 | 1 | 4.888 | 2.739 | .100 |
| Error | 269.459 | 151 | 1.7842 |  |  |
| subject(sequence) | Hypothesis | 388.904 | 59 | 6.592 | 3.694 | .000 |
| Error | 269.459 | 151 | 1.7842 |  |  |

|  |
| --- |
| 1. .921 MS(subject(sequence)) + .079 MS(Error) |
| 2. MS(Error) |
| 3. .937 MS(subject(sequence)) + .063 MS(Error) |

|  |  |  |  |
| --- | --- | --- | --- |
| **Expected Mean Squares1,2** | | | |
| Source | **Variance Component** | | |
| **Var(subject(sequence))** | **Var(Error)** | **Quadratic Term** |
| Intercept | 3.252 | 1.000 | Intercept, period, sequence, treatment |
| period | .000 | 1.000 | period |
| sequence | 3.307 | 1.000 | sequence |
| treatment | .000 | 1.000 | treatment |
| subject(sequence) | 3.530 | 1.000 |  |
| Error | .000 | 1.000 |  |

|  |
| --- |
| 1. For each source, the expected mean square equals the sum of the coefficients in the cells times the variance components, plus a quadratic term involving effects in the Quadratic Term cell. |
| 2. Expected Mean Squares are based on the Type III Sums of Squares. |

Custom Hypothesis Tests

|  |  |  |  |
| --- | --- | --- | --- |
| **Contrast Results (K Matrix)** | | | |
| treatment Simple Contrast1 | | | **Dependent Variable** |
| **lnpk** |
| Level 2 vs. Level 1 | Contrast Estimate | | -.306 |
| Hypothesized Value | | 0 |
| Difference (Estimate - Hypothesized) | | -.306 |
| Std. Error | | .185 |
| Sig. | | .100 |
| 95% Confidence Interval for Difference | Lower Bound | -.672 |
| Upper Bound | .059 |

|  |
| --- |
| 1. Reference category = 1 |

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| **Test Results** | | | | | |
| Dependent Variable: lnpk | | | | | |
| Source | **Sum of Squares** | **df** | **Mean Square** | **F** | **Sig.** |
| Contrast | 4.888 | 1 | 4.888 | 2.739 | .100 |
| Error | 269.459 | 151 | 1.784 |  |  |

MIXED lnpk BY period sequence treatment subject

/CRITERIA=DFMETHOD(SATTERTHWAITE) CIN(95) MXITER(100) MXSTEP(10) SCORING(1)

SINGULAR(0.000000000001) HCONVERGE(0, ABSOLUTE) LCONVERGE(0, ABSOLUTE) PCONVERGE(0.000001, ABSOLUTE)

/FIXED=period sequence treatment | SSTYPE(3)

/METHOD=REML

/RANDOM= subject(sequence) | COVTYPE(ID)

/EMMEANS=TABLES(treatment) COMPARE REFCAT(FIRST) ADJ(LSD).

Mixed Model Analysis

|  |  |  |
| --- | --- | --- |
| **Notes** | | |
| Output Created | | 28-FEB-2021 17:55:06 |
| Comments | |  |
| Input | Active Dataset | pkdataset |
| Filter | <none> |
| Weight | <none> |
| Split File | <none> |
| N of Rows in Working Data File | 216 |
| Missing Value Handling | Definition of Missing | User-defined missing values are treated as missing. |
| Cases Used | Statistics are based on all cases with valid data for all variables in the model. |
| Syntax | | MIXED lnpk BY period sequence treatment subject  /CRITERIA=DFMETHOD(SATTERTHWAITE) CIN(95) MXITER(100) MXSTEP(10) SCORING(1)  SINGULAR(0.000000000001) HCONVERGE(0, ABSOLUTE) LCONVERGE(0, ABSOLUTE) PCONVERGE(0.000001, ABSOLUTE)  /FIXED=period sequence treatment | SSTYPE(3)  /METHOD=REML  /RANDOM= subject(sequence) | COVTYPE(ID)  /EMMEANS=TABLES(treatment) COMPARE REFCAT(FIRST) ADJ(LSD). |
| Resources | Processor Time | 00:00:00.14 |
| Elapsed Time | 00:00:00.12 |

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| **Model Dimension1** | | | | |
|  | | **Number of Levels** | **Covariance Structure** | **Number of Parameters** |
| Fixed Effects | Intercept | 1 |  | 1 |
| period | 4 |  | 3 |
| sequence | 2 |  | 1 |
| treatment | 2 |  | 1 |
| Random Effects | subject(sequence) | 61 | Identity | 1 |
| Residual | |  |  | 1 |
| Total | | 70 |  | 8 |

|  |
| --- |
| 1. Dependent Variable: lnpk. |

|  |  |
| --- | --- |
| **Information Criteria1** | |
| -2 Restricted Log Likelihood | 815.22508020 |
| Akaike's Information Criterion (AIC) | 819.22508020 |
| Hurvich and Tsai's Criterion (AICC) | 819.28305121 |
| Bozdogan's Criterion (CAIC) | 827.91929526 |
| Schwarz's Bayesian Criterion (BIC) | 825.91929526 |

|  |
| --- |
| The information criteria are displayed in smaller-is-better form.1 |
| 1. Dependent Variable: lnpk. |

Fixed Effects

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| **Type III Tests of Fixed Effects1** | | | | |
| Source | **Numerator df** | **Denominator df** | **F** | **Sig.** |
| Intercept | 1 | 61.250 | 8.528 | .005 |
| period | 3 | 157.305 | .075 | .974 |
| sequence | 1 | 60.922 | .063 | .802 |
| treatment | 1 | 156.429 | 2.966 | .087 |

|  |
| --- |
| 1. Dependent Variable: lnpk. |

Covariance Parameters

|  |  |  |  |
| --- | --- | --- | --- |
| **Estimates of Covariance Parameters1** | | | |
| Parameter | | **Estimate** | **Std. Error** |
| Residual | | 1.768713 | .201889 |
| subject(sequence) | Variance | 1.324828 | .336045 |

|  |
| --- |
| 1. Dependent Variable: lnpk. |

Estimated Marginal Means

treatment

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| **Estimates1** | | | | | |
| treatment | **Mean** | **Std. Error** | **df** | **95% Confidence Interval** | |
| **Lower Bound** | **Upper Bound** |
| R | .667 | .196 | 94.513 | .277 | 1.057 |
| T | .351 | .197 | 96.711 | -.041 | .743 |

|  |
| --- |
| 1. Dependent Variable: lnpk. |

|  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- |
| **Pairwise Comparisons1** | | | | | | |
| (I) treatment | (J) treatment | **Mean Difference (I-J)** | **Std. Error** | **df** | **Sig.2** | **95% Confidence Interval for Difference2** |
| **Lower Bound** |
| T | R | -.31571933 | .18332179 | 156.42880919 | .08700730 | -.67782481 |

|  |  |  |
| --- | --- | --- |
| **Pairwise Comparisons1** | | |
| (I) treatment | (J) treatment | 95% Confidence Interval for Difference |
| **Upper Bound** |
| T | R | .04638616 |

|  |
| --- |
| Based on estimated marginal means1 |
| 1. Dependent Variable: lnpk. |
| 2. Adjustment for multiple comparisons: Least Significant Difference (equivalent to no adjustments). |

|  |  |  |  |
| --- | --- | --- | --- |
| **Univariate Tests1** | | | |
| **Numerator df** | **Denominator df** | **F** | **Sig.** |
| 1 | 156.429 | 2.966 | .087 |

|  |
| --- |
| The F tests the effect of treatment. This test is based on the linearly independent pairwise comparisons among the estimated marginal means.1 |
| 1. Dependent Variable: lnpk. |

MIXED lnpk BY period treatment sequence subject

/CRITERIA=CIN(90) MXITER(200) MXSTEP(20) SCORING(2) SINGULAR(0.000000000001) HCONVERGE(0,

RELATIVE) LCONVERGE(0.0000000000001, RELATIVE) PCONVERGE(0, RELATIVE)

/FIXED=period treatment sequence | SSTYPE(3)

/METHOD=REML

/RANDOM=treatment | SUBJECT(subject) COVTYPE(CSH)

/REPEATED=treatment | SUBJECT(subject\*period) COVTYPE(DIAG)

/EMMEANS=TABLES(treatment) COMPARE REFCAT(FIRST) ADJ(LSD).

Mixed Model Analysis

|  |  |  |
| --- | --- | --- |
| **Notes** | | |
| Output Created | | 28-FEB-2021 17:55:07 |
| Comments | |  |
| Input | Active Dataset | pkdataset |
| Filter | <none> |
| Weight | <none> |
| Split File | <none> |
| N of Rows in Working Data File | 216 |
| Missing Value Handling | Definition of Missing | User-defined missing values are treated as missing. |
| Cases Used | Statistics are based on all cases with valid data for all variables in the model. |
| Syntax | | MIXED lnpk BY period treatment sequence subject  /CRITERIA=CIN(90) MXITER(200) MXSTEP(20) SCORING(2) SINGULAR(0.000000000001) HCONVERGE(0,  RELATIVE) LCONVERGE(0.0000000000001, RELATIVE) PCONVERGE(0, RELATIVE)  /FIXED=period treatment sequence | SSTYPE(3)  /METHOD=REML  /RANDOM=treatment | SUBJECT(subject) COVTYPE(CSH)  /REPEATED=treatment | SUBJECT(subject\*period) COVTYPE(DIAG)  /EMMEANS=TABLES(treatment) COMPARE REFCAT(FIRST) ADJ(LSD). |
| Resources | Processor Time | 00:00:00.11 |
| Elapsed Time | 00:00:00.17 |

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| **Model Dimension1** | | | | | |
|  | | **Number of Levels** | **Covariance Structure** | **Number of Parameters** | **Subject Variables** |
| Fixed Effects | Intercept | 1 |  | 1 |  |
| period | 4 |  | 3 |  |
| treatment | 2 |  | 1 |  |
| sequence | 2 |  | 1 |  |
| Random Effects | treatment | 2 | Heterogeneous Compound Symmetry | 3 | subject |
| Repeated Effects | treatment | 2 | Diagonal | 2 | subject \* period |
| Total | | 13 |  | 11 |  |

|  |  |  |
| --- | --- | --- |
| **Model Dimension1** | | |
|  | | **Number of Subjects** |
| Fixed Effects | Intercept |  |
| period |  |
| treatment |  |
| sequence |  |
| Random Effects | treatment |  |
| Repeated Effects | treatment | 216 |
| Total | |  |

|  |
| --- |
| 1. Dependent Variable: lnpk. |

|  |  |
| --- | --- |
| **Information Criteria1** | |
| -2 Restricted Log Likelihood | 782.93959049 |
| Akaike's Information Criterion (AIC) | 792.93959049 |
| Hurvich and Tsai's Criterion (AICC) | 793.23370814 |
| Bozdogan's Criterion (CAIC) | 814.67512815 |
| Schwarz's Bayesian Criterion (BIC) | 809.67512815 |

|  |
| --- |
| The information criteria are displayed in smaller-is-better form.1 |
| 1. Dependent Variable: lnpk. |

Fixed Effects

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| **Type III Tests of Fixed Effects1** | | | | |
| Source | **Numerator df** | **Denominator df** | **F** | **Sig.** |
| Intercept | 1 | 60.431 | 7.831 | .007 |
| period | 3 | 114.144 | .084 | .969 |
| treatment | 1 | 59.220 | 1.400 | .241 |
| sequence | 1 | 60.143 | .102 | .750 |

|  |
| --- |
| 1. Dependent Variable: lnpk. |

Covariance Parameters

|  |  |  |  |
| --- | --- | --- | --- |
| **Estimates of Covariance Parameters1** | | | |
| Parameter | | **Estimate** | **Std. Error** |
| Repeated Measures | Var: [treatment=R] | .862 | .179 |
| Var: [treatment=T] | .990 | .206 |
| treatment [subject = subject] | Var: [treatment=R] | 2.876 | .637 |
| Var: [treatment=T] | 1.522 | .395 |
| CSH rho | .458 | .139 |

|  |
| --- |
| 1. Dependent Variable: lnpk. |

Estimated Marginal Means

treatment

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| **Estimates1** | | | | | |
| treatment | **Mean** | **Std. Error** | **df** | **90% Confidence Interval** | |
| **Lower Bound** | **Upper Bound** |
| R | .635 | .237 | 57.908 | .238 | 1.031 |
| T | .346 | .187 | 61.130 | .034 | .658 |

|  |
| --- |
| 1. Dependent Variable: lnpk. |

|  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- |
| **Pairwise Comparisons1** | | | | | | |
| (I) treatment | (J) treatment | **Mean Difference (I-J)** | **Std. Error** | **df** | **Sig.2** | **90% Confidence Interval for Difference2** |
| **Lower Bound** |
| T | R | -.28853745 | .24384625 | 59.21958060 | .24142820 | -.69600312 |

|  |  |  |
| --- | --- | --- |
| **Pairwise Comparisons1** | | |
| (I) treatment | (J) treatment | 90% Confidence Interval for Difference |
| **Upper Bound** |
| T | R | .11892822 |

|  |
| --- |
| Based on estimated marginal means1 |
| 1. Dependent Variable: lnpk. |
| 2. Adjustment for multiple comparisons: Least Significant Difference (equivalent to no adjustments). |

|  |  |  |  |
| --- | --- | --- | --- |
| **Univariate Tests1** | | | |
| **Numerator df** | **Denominator df** | **F** | **Sig.** |
| 1 | 59.220 | 1.400 | .241 |

|  |
| --- |
| The F tests the effect of treatment. This test is based on the linearly independent pairwise comparisons among the estimated marginal means.1 |
| 1. Dependent Variable: lnpk. |

DATASET CLOSE pkdataset.

TITLE "RDS20".

RDS20

GET DATA

/TYPE=XLSX

/FILE='.\rds01.xlsx'

/SHEET=name 'rds20'

/CELLRANGE=FULL

/READNAMES=ON

/LEADINGSPACES IGNORE=YES

/TRAILINGSPACES IGNORE=YES

/DATATYPEMIN PERCENTAGE=95.0

/HIDDEN IGNORE=YES.

EXECUTE.

DATASET NAME pkdataset WINDOW=FRONT.

COMPUTE lnpk=ln(PK).

EXECUTE.

UNIANOVA lnpk BY period sequence treatment subject

/RANDOM subject

/CONTRAST(treatment)=Simple(1)

/METHOD=SSTYPE(3)

/INTERCEPT=INCLUDE

/CRITERIA=ALPHA(0.05)

/DESIGN=period sequence treatment subject(sequence).

Univariate Analysis of Variance

|  |  |  |
| --- | --- | --- |
| **Notes** | | |
| Output Created | | 28-FEB-2021 17:55:07 |
| Comments | |  |
| Input | Active Dataset | pkdataset |
| Filter | <none> |
| Weight | <none> |
| Split File | <none> |
| N of Rows in Working Data File | 216 |
| Missing Value Handling | Definition of Missing | User-defined missing values are treated as missing. |
| Cases Used | Statistics are based on all cases with valid data for all variables in the model. |
| Syntax | | UNIANOVA lnpk BY period sequence treatment subject  /RANDOM subject  /CONTRAST(treatment)=Simple(1)  /METHOD=SSTYPE(3)  /INTERCEPT=INCLUDE  /CRITERIA=ALPHA(0.05)  /DESIGN=period sequence treatment subject(sequence). |
| Resources | Processor Time | 00:00:00.05 |
| Elapsed Time | 00:00:00.04 |

|  |  |  |
| --- | --- | --- |
| **Between-Subjects Factors** | | |
|  | | **N** |
| period | 1 | 61 |
| 2 | 57 |
| 3 | 52 |
| 4 | 46 |
| sequence | RTRT | 106 |
| TRTR | 110 |
| treatment | R | 109 |
| T | 107 |
| subject | 1 | 4 |
| 2 | 3 |
| 3 | 3 |
| 4 | 4 |
| 5 | 4 |
| 6 | 3 |
| 7 | 4 |
| 8 | 4 |
| 9 | 4 |
| 10 | 4 |
| 11 | 3 |
| 12 | 4 |
| 13 | 4 |
| 14 | 4 |
| 15 | 4 |
| 16 | 4 |
| 17 | 4 |
| 18 | 3 |
| 19 | 3 |
| 20 | 3 |
| 21 | 4 |
| 22 | 3 |
| 23 | 3 |
| 24 | 3 |
| 25 | 4 |
| 26 | 4 |
| 27 | 3 |
| 28 | 4 |
| 29 | 3 |
| 30 | 4 |
| 31 | 3 |
| 32 | 4 |
| 33 | 4 |
| 34 | 2 |
| 35 | 3 |
| 36 | 4 |
| 37 | 4 |
| 38 | 4 |
| 39 | 4 |
| 40 | 4 |
| 41 | 4 |
| 42 | 3 |
| 43 | 2 |
| 44 | 4 |
| 45 | 3 |
| 46 | 3 |
| 47 | 4 |
| 48 | 4 |
| 49 | 4 |
| 50 | 4 |
| 51 | 4 |
| 52 | 2 |
| 53 | 4 |
| 54 | 4 |
| 55 | 4 |
| 56 | 1 |
| 57 | 3 |
| 58 | 4 |
| 59 | 3 |
| 60 | 4 |
| 62 | 4 |

|  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- |
| **Tests of Between-Subjects Effects** | | | | | | |
| Dependent Variable: lnpk | | | | | | |
| Source | | **Type III Sum of Squares** | **df** | **Mean Square** | **F** | **Sig.** |
| Intercept | Hypothesis | 54.203 | 1 | 54.203 | 8.552 | .005 |
| Error | 392.349 | 61.906 | 6.3381 |  |  |
| period | Hypothesis | .455 | 3 | .152 | .079 | .971 |
| Error | 290.971 | 151 | 1.9272 |  |  |
| sequence | Hypothesis | .323 | 1 | .323 | .050 | .823 |
| Error | 392.990 | 61.294 | 6.4123 |  |  |
| treatment | Hypothesis | 6.430 | 1 | 6.430 | 3.337 | .070 |
| Error | 290.971 | 151 | 1.9272 |  |  |
| subject(sequence) | Hypothesis | 396.101 | 59 | 6.714 | 3.484 | .000 |
| Error | 290.971 | 151 | 1.9272 |  |  |

|  |
| --- |
| 1. .921 MS(subject(sequence)) + .079 MS(Error) |
| 2. MS(Error) |
| 3. .937 MS(subject(sequence)) + .063 MS(Error) |

|  |  |  |  |
| --- | --- | --- | --- |
| **Expected Mean Squares1,2** | | | |
| Source | **Variance Component** | | |
| **Var(subject(sequence))** | **Var(Error)** | **Quadratic Term** |
| Intercept | 3.252 | 1.000 | Intercept, period, sequence, treatment |
| period | .000 | 1.000 | period |
| sequence | 3.307 | 1.000 | sequence |
| treatment | .000 | 1.000 | treatment |
| subject(sequence) | 3.530 | 1.000 |  |
| Error | .000 | 1.000 |  |

|  |
| --- |
| 1. For each source, the expected mean square equals the sum of the coefficients in the cells times the variance components, plus a quadratic term involving effects in the Quadratic Term cell. |
| 2. Expected Mean Squares are based on the Type III Sums of Squares. |

Custom Hypothesis Tests

|  |  |  |  |
| --- | --- | --- | --- |
| **Contrast Results (K Matrix)** | | | |
| treatment Simple Contrast1 | | | **Dependent Variable** |
| **lnpk** |
| Level 2 vs. Level 1 | Contrast Estimate | | -.352 |
| Hypothesized Value | | 0 |
| Difference (Estimate - Hypothesized) | | -.352 |
| Std. Error | | .192 |
| Sig. | | .070 |
| 95% Confidence Interval for Difference | Lower Bound | -.732 |
| Upper Bound | .029 |

|  |
| --- |
| 1. Reference category = 1 |

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| **Test Results** | | | | | |
| Dependent Variable: lnpk | | | | | |
| Source | **Sum of Squares** | **df** | **Mean Square** | **F** | **Sig.** |
| Contrast | 6.430 | 1 | 6.430 | 3.337 | .070 |
| Error | 290.971 | 151 | 1.927 |  |  |

MIXED lnpk BY period sequence treatment subject

/CRITERIA=DFMETHOD(SATTERTHWAITE) CIN(95) MXITER(100) MXSTEP(10) SCORING(1)

SINGULAR(0.000000000001) HCONVERGE(0, ABSOLUTE) LCONVERGE(0, ABSOLUTE) PCONVERGE(0.000001, ABSOLUTE)

/FIXED=period sequence treatment | SSTYPE(3)

/METHOD=REML

/RANDOM= subject(sequence) | COVTYPE(ID)

/EMMEANS=TABLES(treatment) COMPARE REFCAT(FIRST) ADJ(LSD).

Mixed Model Analysis

|  |  |  |
| --- | --- | --- |
| **Notes** | | |
| Output Created | | 28-FEB-2021 17:55:07 |
| Comments | |  |
| Input | Active Dataset | pkdataset |
| Filter | <none> |
| Weight | <none> |
| Split File | <none> |
| N of Rows in Working Data File | 216 |
| Missing Value Handling | Definition of Missing | User-defined missing values are treated as missing. |
| Cases Used | Statistics are based on all cases with valid data for all variables in the model. |
| Syntax | | MIXED lnpk BY period sequence treatment subject  /CRITERIA=DFMETHOD(SATTERTHWAITE) CIN(95) MXITER(100) MXSTEP(10) SCORING(1)  SINGULAR(0.000000000001) HCONVERGE(0, ABSOLUTE) LCONVERGE(0, ABSOLUTE) PCONVERGE(0.000001, ABSOLUTE)  /FIXED=period sequence treatment | SSTYPE(3)  /METHOD=REML  /RANDOM= subject(sequence) | COVTYPE(ID)  /EMMEANS=TABLES(treatment) COMPARE REFCAT(FIRST) ADJ(LSD). |
| Resources | Processor Time | 00:00:00.08 |
| Elapsed Time | 00:00:00.16 |

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| **Model Dimension1** | | | | |
|  | | **Number of Levels** | **Covariance Structure** | **Number of Parameters** |
| Fixed Effects | Intercept | 1 |  | 1 |
| period | 4 |  | 3 |
| sequence | 2 |  | 1 |
| treatment | 2 |  | 1 |
| Random Effects | subject(sequence) | 61 | Identity | 1 |
| Residual | |  |  | 1 |
| Total | | 70 |  | 8 |

|  |
| --- |
| 1. Dependent Variable: lnpk. |

|  |  |
| --- | --- |
| **Information Criteria1** | |
| -2 Restricted Log Likelihood | 827.98452988 |
| Akaike's Information Criterion (AIC) | 831.98452988 |
| Hurvich and Tsai's Criterion (AICC) | 832.04250090 |
| Bozdogan's Criterion (CAIC) | 840.67874495 |
| Schwarz's Bayesian Criterion (BIC) | 838.67874495 |

|  |
| --- |
| The information criteria are displayed in smaller-is-better form.1 |
| 1. Dependent Variable: lnpk. |

Fixed Effects

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| **Type III Tests of Fixed Effects1** | | | | |
| Source | **Numerator df** | **Denominator df** | **F** | **Sig.** |
| Intercept | 1 | 61.329 | 9.063 | .004 |
| period | 3 | 157.592 | .086 | .968 |
| sequence | 1 | 60.992 | .020 | .888 |
| treatment | 1 | 156.683 | 3.572 | .061 |

|  |
| --- |
| 1. Dependent Variable: lnpk. |

Covariance Parameters

|  |  |  |  |
| --- | --- | --- | --- |
| **Estimates of Covariance Parameters1** | | | |
| Parameter | | **Estimate** | **Std. Error** |
| Residual | | 1.909064 | .217822 |
| subject(sequence) | Variance | 1.322455 | .343091 |

|  |
| --- |
| 1. Dependent Variable: lnpk. |

Estimated Marginal Means

treatment

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| **Estimates1** | | | | | |
| treatment | **Mean** | **Std. Error** | **df** | **95% Confidence Interval** | |
| **Lower Bound** | **Upper Bound** |
| R | .710 | .200 | 96.470 | .314 | 1.106 |
| T | .350 | .201 | 98.807 | -.048 | .748 |

|  |
| --- |
| 1. Dependent Variable: lnpk. |

|  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- |
| **Pairwise Comparisons1** | | | | | | |
| (I) treatment | (J) treatment | **Mean Difference (I-J)** | **Std. Error** | **df** | **Sig.2** | **95% Confidence Interval for Difference2** |
| **Lower Bound** |
| T | R | -.35983624 | .19040264 | 156.68277290 | .06062226 | -.73592339 |

|  |  |  |
| --- | --- | --- |
| **Pairwise Comparisons1** | | |
| (I) treatment | (J) treatment | 95% Confidence Interval for Difference |
| **Upper Bound** |
| T | R | .01625092 |

|  |
| --- |
| Based on estimated marginal means1 |
| 1. Dependent Variable: lnpk. |
| 2. Adjustment for multiple comparisons: Least Significant Difference (equivalent to no adjustments). |

|  |  |  |  |
| --- | --- | --- | --- |
| **Univariate Tests1** | | | |
| **Numerator df** | **Denominator df** | **F** | **Sig.** |
| 1 | 156.683 | 3.572 | .061 |

|  |
| --- |
| The F tests the effect of treatment. This test is based on the linearly independent pairwise comparisons among the estimated marginal means.1 |
| 1. Dependent Variable: lnpk. |

MIXED lnpk BY period treatment sequence subject

/CRITERIA=CIN(90) MXITER(200) MXSTEP(20) SCORING(2) SINGULAR(0.000000000001) HCONVERGE(0,

RELATIVE) LCONVERGE(0.0000000000001, RELATIVE) PCONVERGE(0, RELATIVE)

/FIXED=period treatment sequence | SSTYPE(3)

/METHOD=REML

/RANDOM=treatment | SUBJECT(subject) COVTYPE(CSH)

/REPEATED=treatment | SUBJECT(subject\*period) COVTYPE(DIAG)

/EMMEANS=TABLES(treatment) COMPARE REFCAT(FIRST) ADJ(LSD).

Mixed Model Analysis

|  |  |  |
| --- | --- | --- |
| **Notes** | | |
| Output Created | | 28-FEB-2021 17:55:08 |
| Comments | |  |
| Input | Active Dataset | pkdataset |
| Filter | <none> |
| Weight | <none> |
| Split File | <none> |
| N of Rows in Working Data File | 216 |
| Missing Value Handling | Definition of Missing | User-defined missing values are treated as missing. |
| Cases Used | Statistics are based on all cases with valid data for all variables in the model. |
| Syntax | | MIXED lnpk BY period treatment sequence subject  /CRITERIA=CIN(90) MXITER(200) MXSTEP(20) SCORING(2) SINGULAR(0.000000000001) HCONVERGE(0,  RELATIVE) LCONVERGE(0.0000000000001, RELATIVE) PCONVERGE(0, RELATIVE)  /FIXED=period treatment sequence | SSTYPE(3)  /METHOD=REML  /RANDOM=treatment | SUBJECT(subject) COVTYPE(CSH)  /REPEATED=treatment | SUBJECT(subject\*period) COVTYPE(DIAG)  /EMMEANS=TABLES(treatment) COMPARE REFCAT(FIRST) ADJ(LSD). |
| Resources | Processor Time | 00:00:00.13 |
| Elapsed Time | 00:00:00.37 |

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| **Model Dimension1** | | | | | |
|  | | **Number of Levels** | **Covariance Structure** | **Number of Parameters** | **Subject Variables** |
| Fixed Effects | Intercept | 1 |  | 1 |  |
| period | 4 |  | 3 |  |
| treatment | 2 |  | 1 |  |
| sequence | 2 |  | 1 |  |
| Random Effects | treatment | 2 | Heterogeneous Compound Symmetry | 3 | subject |
| Repeated Effects | treatment | 2 | Diagonal | 2 | subject \* period |
| Total | | 13 |  | 11 |  |

|  |  |  |
| --- | --- | --- |
| **Model Dimension1** | | |
|  | | **Number of Subjects** |
| Fixed Effects | Intercept |  |
| period |  |
| treatment |  |
| sequence |  |
| Random Effects | treatment |  |
| Repeated Effects | treatment | 216 |
| Total | |  |

|  |
| --- |
| 1. Dependent Variable: lnpk. |

|  |  |
| --- | --- |
| **Information Criteria1** | |
| -2 Restricted Log Likelihood | 796.31244365 |
| Akaike's Information Criterion (AIC) | 806.31244365 |
| Hurvich and Tsai's Criterion (AICC) | 806.60656129 |
| Bozdogan's Criterion (CAIC) | 828.04798130 |
| Schwarz's Bayesian Criterion (BIC) | 823.04798130 |

|  |
| --- |
| The information criteria are displayed in smaller-is-better form.1 |
| 1. Dependent Variable: lnpk. |

Fixed Effects

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| **Type III Tests of Fixed Effects1** | | | | |
| Source | **Numerator df** | **Denominator df** | **F** | **Sig.** |
| Intercept | 1 | 60.452 | 8.489 | .005 |
| period | 3 | 116.277 | .081 | .970 |
| treatment | 1 | 59.498 | 1.713 | .196 |
| sequence | 1 | 60.148 | .042 | .839 |

|  |
| --- |
| 1. Dependent Variable: lnpk. |

Covariance Parameters

|  |  |  |  |
| --- | --- | --- | --- |
| **Estimates of Covariance Parameters1** | | | |
| Parameter | | **Estimate** | **Std. Error** |
| Repeated Measures | Var: [treatment=R] | 1.059 | .218 |
| Var: [treatment=T] | .981 | .203 |
| treatment [subject = subject] | Var: [treatment=R] | 2.940 | .672 |
| Var: [treatment=T] | 1.531 | .396 |
| CSH rho | .440 | .143 |

|  |
| --- |
| 1. Dependent Variable: lnpk. |

Estimated Marginal Means

treatment

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| **Estimates1** | | | | | |
| treatment | **Mean** | **Std. Error** | **df** | **90% Confidence Interval** | |
| **Lower Bound** | **Upper Bound** |
| R | .680 | .243 | 57.937 | .273 | 1.087 |
| T | .351 | .187 | 61.111 | .038 | .663 |

|  |
| --- |
| 1. Dependent Variable: lnpk. |

|  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- |
| **Pairwise Comparisons1** | | | | | | |
| (I) treatment | (J) treatment | **Mean Difference (I-J)** | **Std. Error** | **df** | **Sig.2** | **90% Confidence Interval for Difference2** |
| **Lower Bound** |
| T | R | -.32927497 | .25155729 | 59.49789179 | .19558569 | -.74959450 |

|  |  |  |
| --- | --- | --- |
| **Pairwise Comparisons1** | | |
| (I) treatment | (J) treatment | 90% Confidence Interval for Difference |
| **Upper Bound** |
| T | R | .09104455 |

|  |
| --- |
| Based on estimated marginal means1 |
| 1. Dependent Variable: lnpk. |
| 2. Adjustment for multiple comparisons: Least Significant Difference (equivalent to no adjustments). |

|  |  |  |  |
| --- | --- | --- | --- |
| **Univariate Tests1** | | | |
| **Numerator df** | **Denominator df** | **F** | **Sig.** |
| 1 | 59.498 | 1.713 | .196 |

|  |
| --- |
| The F tests the effect of treatment. This test is based on the linearly independent pairwise comparisons among the estimated marginal means.1 |
| 1. Dependent Variable: lnpk. |

DATASET CLOSE pkdataset.

TITLE "RDS21".

RDS21

GET DATA

/TYPE=XLSX

/FILE='.\rds01.xlsx'

/SHEET=name 'rds21'

/CELLRANGE=FULL

/READNAMES=ON

/LEADINGSPACES IGNORE=YES

/TRAILINGSPACES IGNORE=YES

/DATATYPEMIN PERCENTAGE=95.0

/HIDDEN IGNORE=YES.

EXECUTE.

DATASET NAME pkdataset WINDOW=FRONT.

COMPUTE lnpk=ln(PK).

EXECUTE.

UNIANOVA lnpk BY period sequence treatment subject

/RANDOM subject

/CONTRAST(treatment)=Simple(1)

/METHOD=SSTYPE(3)

/INTERCEPT=INCLUDE

/CRITERIA=ALPHA(0.05)

/DESIGN=period sequence treatment subject(sequence).

Univariate Analysis of Variance

|  |  |  |
| --- | --- | --- |
| **Notes** | | |
| Output Created | | 28-FEB-2021 17:55:09 |
| Comments | |  |
| Input | Active Dataset | pkdataset |
| Filter | <none> |
| Weight | <none> |
| Split File | <none> |
| N of Rows in Working Data File | 298 |
| Missing Value Handling | Definition of Missing | User-defined missing values are treated as missing. |
| Cases Used | Statistics are based on all cases with valid data for all variables in the model. |
| Syntax | | UNIANOVA lnpk BY period sequence treatment subject  /RANDOM subject  /CONTRAST(treatment)=Simple(1)  /METHOD=SSTYPE(3)  /INTERCEPT=INCLUDE  /CRITERIA=ALPHA(0.05)  /DESIGN=period sequence treatment subject(sequence). |
| Resources | Processor Time | 00:00:00.02 |
| Elapsed Time | 00:00:00.09 |

|  |  |  |
| --- | --- | --- |
| **Between-Subjects Factors** | | |
|  | | **N** |
| period | 1 | 76 |
| 2 | 76 |
| 3 | 69 |
| 4 | 75 |
| sequence | RTRT | 147 |
| TRTR | 149 |
| treatment | R | 148 |
| T | 148 |
| subject | 1 | 4 |
| 2 | 4 |
| 3 | 4 |
| 4 | 4 |
| 5 | 4 |
| 6 | 4 |
| 7 | 4 |
| 8 | 4 |
| 9 | 4 |
| 10 | 4 |
| 11 | 3 |
| 12 | 4 |
| 13 | 4 |
| 14 | 4 |
| 15 | 4 |
| 16 | 4 |
| 17 | 4 |
| 18 | 4 |
| 19 | 4 |
| 20 | 3 |
| 21 | 4 |
| 22 | 4 |
| 23 | 4 |
| 24 | 3 |
| 25 | 4 |
| 26 | 4 |
| 27 | 4 |
| 28 | 4 |
| 29 | 4 |
| 30 | 4 |
| 31 | 3 |
| 32 | 4 |
| 33 | 4 |
| 34 | 4 |
| 35 | 4 |
| 36 | 4 |
| 37 | 4 |
| 38 | 4 |
| 39 | 4 |
| 40 | 4 |
| 41 | 4 |
| 42 | 3 |
| 43 | 4 |
| 44 | 4 |
| 45 | 3 |
| 46 | 4 |
| 47 | 4 |
| 48 | 4 |
| 49 | 4 |
| 50 | 4 |
| 51 | 4 |
| 52 | 3 |
| 53 | 4 |
| 54 | 4 |
| 55 | 4 |
| 56 | 4 |
| 57 | 4 |
| 58 | 4 |
| 59 | 4 |
| 60 | 4 |
| 62 | 4 |
| 63 | 4 |
| 64 | 4 |
| 65 | 4 |
| 66 | 4 |
| 67 | 2 |
| 68 | 4 |
| 69 | 3 |
| 70 | 4 |
| 71 | 2 |
| 72 | 4 |
| 73 | 4 |
| 74 | 4 |
| 75 | 4 |
| 76 | 4 |
| 77 | 4 |
| 78 | 4 |

|  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- |
| **Tests of Between-Subjects Effects** | | | | | | |
| Dependent Variable: lnpk | | | | | | |
| Source | | **Type III Sum of Squares** | **df** | **Mean Square** | **F** | **Sig.** |
| Intercept | Hypothesis | 17274.041 | 1 | 17274.041 | 6093.760 | .000 |
| Error | 212.988 | 75.136 | 2.8351 |  |  |
| period | Hypothesis | .718 | 3 | .239 | 1.987 | .117 |
| Error | 25.915 | 215 | .1212 |  |  |
| sequence | Hypothesis | .006 | 1 | .006 | .002 | .964 |
| Error | 213.421 | 75.121 | 2.8413 |  |  |
| treatment | Hypothesis | 2.319 | 1 | 2.319 | 19.237 | .000 |
| Error | 25.915 | 215 | .1212 |  |  |
| subject(sequence) | Hypothesis | 217.023 | 75 | 2.894 | 24.007 | .000 |
| Error | 25.915 | 215 | .1212 |  |  |

|  |
| --- |
| 1. .979 MS(subject(sequence)) + .021 MS(Error) |
| 2. MS(Error) |
| 3. .981 MS(subject(sequence)) + .019 MS(Error) |

|  |  |  |  |
| --- | --- | --- | --- |
| **Expected Mean Squares1,2** | | | |
| Source | **Variance Component** | | |
| **Var(subject(sequence))** | **Var(Error)** | **Quadratic Term** |
| Intercept | 3.759 | 1.000 | Intercept, period, sequence, treatment |
| period | .000 | 1.000 | period |
| sequence | 3.768 | 1.000 | sequence |
| treatment | .000 | 1.000 | treatment |
| subject(sequence) | 3.841 | 1.000 |  |
| Error | .000 | 1.000 |  |

|  |
| --- |
| 1. For each source, the expected mean square equals the sum of the coefficients in the cells times the variance components, plus a quadratic term involving effects in the Quadratic Term cell. |
| 2. Expected Mean Squares are based on the Type III Sums of Squares. |

Custom Hypothesis Tests

|  |  |  |  |
| --- | --- | --- | --- |
| **Contrast Results (K Matrix)** | | | |
| treatment Simple Contrast1 | | | **Dependent Variable** |
| **lnpk** |
| Level 2 vs. Level 1 | Contrast Estimate | | .178 |
| Hypothesized Value | | 0 |
| Difference (Estimate - Hypothesized) | | .178 |
| Std. Error | | .041 |
| Sig. | | .000 |
| 95% Confidence Interval for Difference | Lower Bound | .098 |
| Upper Bound | .258 |

|  |
| --- |
| 1. Reference category = 1 |

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| **Test Results** | | | | | |
| Dependent Variable: lnpk | | | | | |
| Source | **Sum of Squares** | **df** | **Mean Square** | **F** | **Sig.** |
| Contrast | 2.319 | 1 | 2.319 | 19.237 | .000 |
| Error | 25.915 | 215 | .121 |  |  |

MIXED lnpk BY period sequence treatment subject

/CRITERIA=DFMETHOD(SATTERTHWAITE) CIN(95) MXITER(100) MXSTEP(10) SCORING(1)

SINGULAR(0.000000000001) HCONVERGE(0, ABSOLUTE) LCONVERGE(0, ABSOLUTE) PCONVERGE(0.000001, ABSOLUTE)

/FIXED=period sequence treatment | SSTYPE(3)

/METHOD=REML

/RANDOM= subject(sequence) | COVTYPE(ID)

/EMMEANS=TABLES(treatment) COMPARE REFCAT(FIRST) ADJ(LSD).

Mixed Model Analysis

|  |  |  |
| --- | --- | --- |
| **Notes** | | |
| Output Created | | 28-FEB-2021 17:55:09 |
| Comments | |  |
| Input | Active Dataset | pkdataset |
| Filter | <none> |
| Weight | <none> |
| Split File | <none> |
| N of Rows in Working Data File | 298 |
| Missing Value Handling | Definition of Missing | User-defined missing values are treated as missing. |
| Cases Used | Statistics are based on all cases with valid data for all variables in the model. |
| Syntax | | MIXED lnpk BY period sequence treatment subject  /CRITERIA=DFMETHOD(SATTERTHWAITE) CIN(95) MXITER(100) MXSTEP(10) SCORING(1)  SINGULAR(0.000000000001) HCONVERGE(0, ABSOLUTE) LCONVERGE(0, ABSOLUTE) PCONVERGE(0.000001, ABSOLUTE)  /FIXED=period sequence treatment | SSTYPE(3)  /METHOD=REML  /RANDOM= subject(sequence) | COVTYPE(ID)  /EMMEANS=TABLES(treatment) COMPARE REFCAT(FIRST) ADJ(LSD). |
| Resources | Processor Time | 00:00:00.16 |
| Elapsed Time | 00:00:00.18 |

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| **Model Dimension1** | | | | |
|  | | **Number of Levels** | **Covariance Structure** | **Number of Parameters** |
| Fixed Effects | Intercept | 1 |  | 1 |
| period | 4 |  | 3 |
| sequence | 2 |  | 1 |
| treatment | 2 |  | 1 |
| Random Effects | subject(sequence) | 77 | Identity | 1 |
| Residual | |  |  | 1 |
| Total | | 86 |  | 8 |

|  |
| --- |
| 1. Dependent Variable: lnpk. |

|  |  |
| --- | --- |
| **Information Criteria1** | |
| -2 Restricted Log Likelihood | 474.08826546 |
| Akaike's Information Criterion (AIC) | 478.08826546 |
| Hurvich and Tsai's Criterion (AICC) | 478.13007730 |
| Bozdogan's Criterion (CAIC) | 487.42802730 |
| Schwarz's Bayesian Criterion (BIC) | 485.42802730 |

|  |
| --- |
| The information criteria are displayed in smaller-is-better form.1 |
| 1. Dependent Variable: lnpk. |

Fixed Effects

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| **Type III Tests of Fixed Effects1** | | | | |
| Source | **Numerator df** | **Denominator df** | **F** | **Sig.** |
| Intercept | 1 | 74.820 | 6018.865 | .000 |
| period | 3 | 215.152 | 2.013 | .113 |
| sequence | 1 | 74.807 | .002 | .962 |
| treatment | 1 | 215.009 | 19.221 | .000 |

|  |
| --- |
| 1. Dependent Variable: lnpk. |

Covariance Parameters

|  |  |  |  |
| --- | --- | --- | --- |
| **Estimates of Covariance Parameters1** | | | |
| Parameter | | **Estimate** | **Std. Error** |
| Residual | | .120590 | .011636 |
| subject(sequence) | Variance | .731614 | .124888 |

|  |
| --- |
| 1. Dependent Variable: lnpk. |

Estimated Marginal Means

treatment

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| **Estimates1** | | | | | |
| treatment | **Mean** | **Std. Error** | **df** | **95% Confidence Interval** | |
| **Lower Bound** | **Upper Bound** |
| R | 7.638 | .102 | 81.098 | 7.436 | 7.840 |
| T | 7.816 | .102 | 81.112 | 7.613 | 8.018 |

|  |
| --- |
| 1. Dependent Variable: lnpk. |

|  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- |
| **Pairwise Comparisons1** | | | | | | |
| (I) treatment | (J) treatment | **Mean Difference (I-J)** | **Std. Error** | **df** | **Sig.3** | **95% Confidence Interval for Difference3** |
| **Lower Bound** |
| T | R | .17778421\* | .04055096 | 215.00944562 | .00001821 | .09785588 |

|  |  |  |
| --- | --- | --- |
| **Pairwise Comparisons1** | | |
| (I) treatment | (J) treatment | 95% Confidence Interval for Difference |
| **Upper Bound** |
| T | R | .25771253 |

|  |
| --- |
| Based on estimated marginal means1 |
| \*. The mean difference is significant at the .05 level. |
| 1. Dependent Variable: lnpk. |
| 3. Adjustment for multiple comparisons: Least Significant Difference (equivalent to no adjustments). |

|  |  |  |  |
| --- | --- | --- | --- |
| **Univariate Tests1** | | | |
| **Numerator df** | **Denominator df** | **F** | **Sig.** |
| 1 | 215.009 | 19.221 | .000 |

|  |
| --- |
| The F tests the effect of treatment. This test is based on the linearly independent pairwise comparisons among the estimated marginal means.1 |
| 1. Dependent Variable: lnpk. |

MIXED lnpk BY period treatment sequence subject

/CRITERIA=CIN(90) MXITER(200) MXSTEP(20) SCORING(2) SINGULAR(0.000000000001) HCONVERGE(0,

RELATIVE) LCONVERGE(0.0000000000001, RELATIVE) PCONVERGE(0, RELATIVE)

/FIXED=period treatment sequence | SSTYPE(3)

/METHOD=REML

/RANDOM=treatment | SUBJECT(subject) COVTYPE(CSH)

/REPEATED=treatment | SUBJECT(subject\*period) COVTYPE(DIAG)

/EMMEANS=TABLES(treatment) COMPARE REFCAT(FIRST) ADJ(LSD).

Mixed Model Analysis

|  |  |  |
| --- | --- | --- |
| **Notes** | | |
| Output Created | | 28-FEB-2021 17:55:09 |
| Comments | |  |
| Input | Active Dataset | pkdataset |
| Filter | <none> |
| Weight | <none> |
| Split File | <none> |
| N of Rows in Working Data File | 298 |
| Missing Value Handling | Definition of Missing | User-defined missing values are treated as missing. |
| Cases Used | Statistics are based on all cases with valid data for all variables in the model. |
| Syntax | | MIXED lnpk BY period treatment sequence subject  /CRITERIA=CIN(90) MXITER(200) MXSTEP(20) SCORING(2) SINGULAR(0.000000000001) HCONVERGE(0,  RELATIVE) LCONVERGE(0.0000000000001, RELATIVE) PCONVERGE(0, RELATIVE)  /FIXED=period treatment sequence | SSTYPE(3)  /METHOD=REML  /RANDOM=treatment | SUBJECT(subject) COVTYPE(CSH)  /REPEATED=treatment | SUBJECT(subject\*period) COVTYPE(DIAG)  /EMMEANS=TABLES(treatment) COMPARE REFCAT(FIRST) ADJ(LSD). |
| Resources | Processor Time | 00:00:00.16 |
| Elapsed Time | 00:00:00.30 |

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| **Model Dimension1** | | | | | |
|  | | **Number of Levels** | **Covariance Structure** | **Number of Parameters** | **Subject Variables** |
| Fixed Effects | Intercept | 1 |  | 1 |  |
| period | 4 |  | 3 |  |
| treatment | 2 |  | 1 |  |
| sequence | 2 |  | 1 |  |
| Random Effects | treatment | 2 | Heterogeneous Compound Symmetry | 3 | subject |
| Repeated Effects | treatment | 2 | Diagonal | 2 | subject \* period |
| Total | | 13 |  | 11 |  |

|  |  |  |
| --- | --- | --- |
| **Model Dimension1** | | |
|  | | **Number of Subjects** |
| Fixed Effects | Intercept |  |
| period |  |
| treatment |  |
| sequence |  |
| Random Effects | treatment |  |
| Repeated Effects | treatment | 296 |
| Total | |  |

|  |
| --- |
| 1. Dependent Variable: lnpk. |

|  |  |
| --- | --- |
| **Information Criteria1** | |
| -2 Restricted Log Likelihood | 470.59083255 |
| Akaike's Information Criterion (AIC) | 480.59083255 |
| Hurvich and Tsai's Criterion (AICC) | 480.80210016 |
| Bozdogan's Criterion (CAIC) | 503.94023717 |
| Schwarz's Bayesian Criterion (BIC) | 498.94023717 |

|  |
| --- |
| The information criteria are displayed in smaller-is-better form.1 |
| 1. Dependent Variable: lnpk. |

Fixed Effects

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| **Type III Tests of Fixed Effects1** | | | | |
| Source | **Numerator df** | **Denominator df** | **F** | **Sig.** |
| Intercept | 1 | 74.836 | 6010.519 | .000 |
| period | 3 | 186.593 | 2.033 | .111 |
| treatment | 1 | 74.690 | 17.130 | .000 |
| sequence | 1 | 74.823 | .002 | .962 |

|  |
| --- |
| 1. Dependent Variable: lnpk. |

Covariance Parameters

|  |  |  |  |
| --- | --- | --- | --- |
| **Estimates of Covariance Parameters1** | | | |
| Parameter | | **Estimate** | **Std. Error** |
| Repeated Measures | Var: [treatment=R] | .102 | .018 |
| Var: [treatment=T] | .121 | .021 |
| treatment [subject = subject] | Var: [treatment=R] | .799 | .140 |
| Var: [treatment=T] | .685 | .123 |
| CSH rho | .984 | .018 |

|  |
| --- |
| 1. Dependent Variable: lnpk. |

Estimated Marginal Means

treatment

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| **Estimates1** | | | | | |
| treatment | **Mean** | **Std. Error** | **df** | **90% Confidence Interval** | |
| **Lower Bound** | **Upper Bound** |
| R | 7.636 | .105 | 74.667 | 7.461 | 7.811 |
| T | 7.816 | .099 | 74.877 | 7.652 | 7.980 |

|  |
| --- |
| 1. Dependent Variable: lnpk. |

|  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- |
| **Pairwise Comparisons1** | | | | | | |
| (I) treatment | (J) treatment | **Mean Difference (I-J)** | **Std. Error** | **df** | **Sig.3** | **90% Confidence Interval for Difference3** |
| **Lower Bound** |
| T | R | .17983927\* | .04345100 | 74.69026210 | .00009068 | .10747112 |

|  |  |  |
| --- | --- | --- |
| **Pairwise Comparisons1** | | |
| (I) treatment | (J) treatment | 90% Confidence Interval for Difference |
| **Upper Bound** |
| T | R | .25220742 |

|  |
| --- |
| Based on estimated marginal means1 |
| \*. The mean difference is significant at the .10 level. |
| 1. Dependent Variable: lnpk. |
| 3. Adjustment for multiple comparisons: Least Significant Difference (equivalent to no adjustments). |

|  |  |  |  |
| --- | --- | --- | --- |
| **Univariate Tests1** | | | |
| **Numerator df** | **Denominator df** | **F** | **Sig.** |
| 1 | 74.690 | 17.130 | .000 |

|  |
| --- |
| The F tests the effect of treatment. This test is based on the linearly independent pairwise comparisons among the estimated marginal means.1 |
| 1. Dependent Variable: lnpk. |

DATASET CLOSE pkdataset.

TITLE "RDS22".

RDS22

GET DATA

/TYPE=XLSX

/FILE='.\rds01.xlsx'

/SHEET=name 'rds22'

/CELLRANGE=FULL

/READNAMES=ON

/LEADINGSPACES IGNORE=YES

/TRAILINGSPACES IGNORE=YES

/DATATYPEMIN PERCENTAGE=95.0

/HIDDEN IGNORE=YES.

EXECUTE.

DATASET NAME pkdataset WINDOW=FRONT.

COMPUTE lnpk=ln(PK).

EXECUTE.

UNIANOVA lnpk BY period sequence treatment subject

/RANDOM subject

/CONTRAST(treatment)=Simple(1)

/METHOD=SSTYPE(3)

/INTERCEPT=INCLUDE

/CRITERIA=ALPHA(0.05)

/DESIGN=period sequence treatment subject(sequence).

Univariate Analysis of Variance

|  |  |  |
| --- | --- | --- |
| **Notes** | | |
| Output Created | | 28-FEB-2021 17:55:10 |
| Comments | |  |
| Input | Active Dataset | pkdataset |
| Filter | <none> |
| Weight | <none> |
| Split File | <none> |
| N of Rows in Working Data File | 126 |
| Missing Value Handling | Definition of Missing | User-defined missing values are treated as missing. |
| Cases Used | Statistics are based on all cases with valid data for all variables in the model. |
| Syntax | | UNIANOVA lnpk BY period sequence treatment subject  /RANDOM subject  /CONTRAST(treatment)=Simple(1)  /METHOD=SSTYPE(3)  /INTERCEPT=INCLUDE  /CRITERIA=ALPHA(0.05)  /DESIGN=period sequence treatment subject(sequence). |
| Resources | Processor Time | 00:00:00.00 |
| Elapsed Time | 00:00:00.09 |

|  |  |  |
| --- | --- | --- |
| **Between-Subjects Factors** | | |
|  | | **N** |
| period | 1 | 42 |
| 2 | 42 |
| 3 | 42 |
| sequence | RTR | 63 |
| TRR | 63 |
| treatment | R | 84 |
| T | 42 |
| subject | 1 | 3 |
| 2 | 3 |
| 3 | 3 |
| 4 | 3 |
| 5 | 3 |
| 6 | 3 |
| 7 | 3 |
| 8 | 3 |
| 9 | 3 |
| 10 | 3 |
| 11 | 3 |
| 12 | 3 |
| 13 | 3 |
| 14 | 3 |
| 15 | 3 |
| 16 | 3 |
| 17 | 3 |
| 18 | 3 |
| 19 | 3 |
| 20 | 3 |
| 21 | 3 |
| 22 | 3 |
| 23 | 3 |
| 24 | 3 |
| 25 | 3 |
| 26 | 3 |
| 27 | 3 |
| 28 | 3 |
| 29 | 3 |
| 30 | 3 |
| 31 | 3 |
| 32 | 3 |
| 33 | 3 |
| 34 | 3 |
| 35 | 3 |
| 36 | 3 |
| 37 | 3 |
| 38 | 3 |
| 39 | 3 |
| 40 | 3 |
| 41 | 3 |
| 42 | 3 |

|  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- |
| **Tests of Between-Subjects Effects** | | | | | | |
| Dependent Variable: lnpk | | | | | | |
| Source | | **Type III Sum of Squares** | **df** | **Mean Square** | **F** | **Sig.** |
| Intercept | Hypothesis | 2090.781 | 1 | 2090.781 | 1215.808 | .000 |
| Error | 70.878 | 41.216 | 1.7201 |  |  |
| period | Hypothesis | .440 | 2 | .220 | 1.225 | .299 |
| Error | 14.546 | 81 | .1802 |  |  |
| sequence | Hypothesis | .311 | 1 | .311 | .157 | .694 |
| Error | 79.054 | 40 | 1.9763 |  |  |
| treatment | Hypothesis | .189 | 1 | .189 | 1.051 | .308 |
| Error | 14.546 | 81 | .1802 |  |  |
| subject(sequence) | Hypothesis | 79.054 | 40 | 1.976 | 11.005 | .000 |
| Error | 14.546 | 81 | .1802 |  |  |

|  |
| --- |
| 1. .857 MS(subject(sequence)) + .143 MS(Error) |
| 2. MS(Error) |
| 3. MS(subject(sequence)) |

|  |  |  |  |
| --- | --- | --- | --- |
| **Expected Mean Squares1,2** | | | |
| Source | **Variance Component** | | |
| **Var(subject(sequence))** | **Var(Error)** | **Quadratic Term** |
| Intercept | 2.571 | 1.000 | Intercept, period, sequence, treatment |
| period | .000 | 1.000 | period |
| sequence | 3.000 | 1.000 | sequence |
| treatment | .000 | 1.000 | treatment |
| subject(sequence) | 3.000 | 1.000 |  |
| Error | .000 | 1.000 |  |

|  |
| --- |
| 1. For each source, the expected mean square equals the sum of the coefficients in the cells times the variance components, plus a quadratic term involving effects in the Quadratic Term cell. |
| 2. Expected Mean Squares are based on the Type III Sums of Squares. |

Custom Hypothesis Tests

|  |  |  |  |
| --- | --- | --- | --- |
| **Contrast Results (K Matrix)** | | | |
| treatment Simple Contrast1 | | | **Dependent Variable** |
| **lnpk** |
| Level 2 vs. Level 1 | Contrast Estimate | | -.095 |
| Hypothesized Value | | 0 |
| Difference (Estimate - Hypothesized) | | -.095 |
| Std. Error | | .092 |
| Sig. | | .308 |
| 95% Confidence Interval for Difference | Lower Bound | -.279 |
| Upper Bound | .089 |

|  |
| --- |
| 1. Reference category = 1 |

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| **Test Results** | | | | | |
| Dependent Variable: lnpk | | | | | |
| Source | **Sum of Squares** | **df** | **Mean Square** | **F** | **Sig.** |
| Contrast | .189 | 1 | .189 | 1.051 | .308 |
| Error | 14.546 | 81 | .180 |  |  |

MIXED lnpk BY period sequence treatment subject

/CRITERIA=DFMETHOD(SATTERTHWAITE) CIN(95) MXITER(100) MXSTEP(10) SCORING(1)

SINGULAR(0.000000000001) HCONVERGE(0, ABSOLUTE) LCONVERGE(0, ABSOLUTE) PCONVERGE(0.000001, ABSOLUTE)

/FIXED=period sequence treatment | SSTYPE(3)

/METHOD=REML

/RANDOM= subject(sequence) | COVTYPE(ID)

/EMMEANS=TABLES(treatment) COMPARE REFCAT(FIRST) ADJ(LSD).

Mixed Model Analysis

|  |  |  |
| --- | --- | --- |
| **Notes** | | |
| Output Created | | 28-FEB-2021 17:55:10 |
| Comments | |  |
| Input | Active Dataset | pkdataset |
| Filter | <none> |
| Weight | <none> |
| Split File | <none> |
| N of Rows in Working Data File | 126 |
| Missing Value Handling | Definition of Missing | User-defined missing values are treated as missing. |
| Cases Used | Statistics are based on all cases with valid data for all variables in the model. |
| Syntax | | MIXED lnpk BY period sequence treatment subject  /CRITERIA=DFMETHOD(SATTERTHWAITE) CIN(95) MXITER(100) MXSTEP(10) SCORING(1)  SINGULAR(0.000000000001) HCONVERGE(0, ABSOLUTE) LCONVERGE(0, ABSOLUTE) PCONVERGE(0.000001, ABSOLUTE)  /FIXED=period sequence treatment | SSTYPE(3)  /METHOD=REML  /RANDOM= subject(sequence) | COVTYPE(ID)  /EMMEANS=TABLES(treatment) COMPARE REFCAT(FIRST) ADJ(LSD). |
| Resources | Processor Time | 00:00:00.05 |
| Elapsed Time | 00:00:00.06 |

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| **Model Dimension1** | | | | |
|  | | **Number of Levels** | **Covariance Structure** | **Number of Parameters** |
| Fixed Effects | Intercept | 1 |  | 1 |
| period | 3 |  | 2 |
| sequence | 2 |  | 1 |
| treatment | 2 |  | 1 |
| Random Effects | subject(sequence) | 42 | Identity | 1 |
| Residual | |  |  | 1 |
| Total | | 50 |  | 7 |

|  |
| --- |
| 1. Dependent Variable: lnpk. |

|  |  |
| --- | --- |
| **Information Criteria1** | |
| -2 Restricted Log Likelihood | 249.25371191 |
| Akaike's Information Criterion (AIC) | 253.25371191 |
| Hurvich and Tsai's Criterion (AICC) | 253.35540682 |
| Bozdogan's Criterion (CAIC) | 260.84529300 |
| Schwarz's Bayesian Criterion (BIC) | 258.84529300 |

|  |
| --- |
| The information criteria are displayed in smaller-is-better form.1 |
| 1. Dependent Variable: lnpk. |

Fixed Effects

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| **Type III Tests of Fixed Effects1** | | | | |
| Source | **Numerator df** | **Denominator df** | **F** | **Sig.** |
| Intercept | 1 | 41.216 | 1215.808 | .000 |
| period | 2 | 81.000 | 1.225 | .299 |
| sequence | 1 | 40.000 | .157 | .694 |
| treatment | 1 | 81.000 | 1.051 | .308 |

|  |
| --- |
| 1. Dependent Variable: lnpk. |

Covariance Parameters

|  |  |  |  |
| --- | --- | --- | --- |
| **Estimates of Covariance Parameters1** | | | |
| Parameter | | **Estimate** | **Std. Error** |
| Residual | | .179582 | .028219 |
| subject(sequence) | Variance | .598920 | .147608 |

|  |
| --- |
| 1. Dependent Variable: lnpk. |

Estimated Marginal Means

treatment

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| **Estimates1** | | | | | |
| treatment | **Mean** | **Std. Error** | **df** | **95% Confidence Interval** | |
| **Lower Bound** | **Upper Bound** |
| R | 4.447 | .129 | 44.912 | 4.188 | 4.707 |
| T | 4.353 | .140 | 59.994 | 4.073 | 4.632 |

|  |
| --- |
| 1. Dependent Variable: lnpk. |

|  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- |
| **Pairwise Comparisons1** | | | | | | |
| (I) treatment | (J) treatment | **Mean Difference (I-J)** | **Std. Error** | **df** | **Sig.2** | **95% Confidence Interval for Difference2** |
| **Lower Bound** |
| T | R | -.09478922 | .09247452 | 81.00000000 | .30840017 | -.27878451 |

|  |  |  |
| --- | --- | --- |
| **Pairwise Comparisons1** | | |
| (I) treatment | (J) treatment | 95% Confidence Interval for Difference |
| **Upper Bound** |
| T | R | .08920606 |

|  |
| --- |
| Based on estimated marginal means1 |
| 1. Dependent Variable: lnpk. |
| 2. Adjustment for multiple comparisons: Least Significant Difference (equivalent to no adjustments). |

|  |  |  |  |
| --- | --- | --- | --- |
| **Univariate Tests1** | | | |
| **Numerator df** | **Denominator df** | **F** | **Sig.** |
| 1 | 81.000 | 1.051 | .308 |

|  |
| --- |
| The F tests the effect of treatment. This test is based on the linearly independent pairwise comparisons among the estimated marginal means.1 |
| 1. Dependent Variable: lnpk. |

MIXED lnpk BY period treatment sequence subject

/CRITERIA=CIN(90) MXITER(200) MXSTEP(20) SCORING(2) SINGULAR(0.000000000001) HCONVERGE(0,

RELATIVE) LCONVERGE(0.0000000000001, RELATIVE) PCONVERGE(0, RELATIVE)

/FIXED=period treatment sequence | SSTYPE(3)

/METHOD=REML

/RANDOM=treatment | SUBJECT(subject) COVTYPE(CSH)

/REPEATED=treatment | SUBJECT(subject\*period) COVTYPE(DIAG)

/EMMEANS=TABLES(treatment) COMPARE REFCAT(FIRST) ADJ(LSD).

Mixed Model Analysis

|  |  |  |
| --- | --- | --- |
| **Notes** | | |
| Output Created | | 28-FEB-2021 17:55:10 |
| Comments | |  |
| Input | Active Dataset | pkdataset |
| Filter | <none> |
| Weight | <none> |
| Split File | <none> |
| N of Rows in Working Data File | 126 |
| Missing Value Handling | Definition of Missing | User-defined missing values are treated as missing. |
| Cases Used | Statistics are based on all cases with valid data for all variables in the model. |
| Syntax | | MIXED lnpk BY period treatment sequence subject  /CRITERIA=CIN(90) MXITER(200) MXSTEP(20) SCORING(2) SINGULAR(0.000000000001) HCONVERGE(0,  RELATIVE) LCONVERGE(0.0000000000001, RELATIVE) PCONVERGE(0, RELATIVE)  /FIXED=period treatment sequence | SSTYPE(3)  /METHOD=REML  /RANDOM=treatment | SUBJECT(subject) COVTYPE(CSH)  /REPEATED=treatment | SUBJECT(subject\*period) COVTYPE(DIAG)  /EMMEANS=TABLES(treatment) COMPARE REFCAT(FIRST) ADJ(LSD). |
| Resources | Processor Time | 00:00:00.14 |
| Elapsed Time | 00:00:00.20 |

|  |
| --- |
| **Warnings** |
| Iteration was terminated but convergence has not been achieved. The MIXED procedure continues despite this warning. Subsequent results produced are based on the last iteration. Validity of the model fit is uncertain. |

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| **Model Dimension1** | | | | | |
|  | | **Number of Levels** | **Covariance Structure** | **Number of Parameters** | **Subject Variables** |
| Fixed Effects | Intercept | 1 |  | 1 |  |
| period | 3 |  | 2 |  |
| treatment | 2 |  | 1 |  |
| sequence | 2 |  | 1 |  |
| Random Effects | treatment | 2 | Heterogeneous Compound Symmetry | 3 | subject |
| Repeated Effects | treatment | 2 | Diagonal | 2 | subject \* period |
| Total | | 12 |  | 10 |  |

|  |  |  |
| --- | --- | --- |
| **Model Dimension1** | | |
|  | | **Number of Subjects** |
| Fixed Effects | Intercept |  |
| period |  |
| treatment |  |
| sequence |  |
| Random Effects | treatment |  |
| Repeated Effects | treatment | 126 |
| Total | |  |

|  |
| --- |
| 1. Dependent Variable: lnpk. |

|  |  |
| --- | --- |
| **Information Criteria1** | |
| -2 Restricted Log Likelihood | 248.99027588 |
| Akaike's Information Criterion (AIC) | 258.99027588 |
| Hurvich and Tsai's Criterion (AICC) | 259.51201501 |
| Bozdogan's Criterion (CAIC) | 277.96922861 |
| Schwarz's Bayesian Criterion (BIC) | 272.96922861 |

|  |
| --- |
| The information criteria are displayed in smaller-is-better form.1 |
| 1. Dependent Variable: lnpk. |

Fixed Effects

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| **Type III Tests of Fixed Effects1** | | | | |
| Source | **Numerator df** | **Denominator df** | **F** | **Sig.** |
| Intercept | 1 | 40.314 | 1196.879 | .000 |
| period | 2 | 49.661 | 1.203 | .309 |
| treatment | 1 | 65.464 | 1.063 | .306 |
| sequence | 1 | 40.089 | .172 | .681 |

|  |
| --- |
| 1. Dependent Variable: lnpk. |

Covariance Parameters

|  |  |  |  |
| --- | --- | --- | --- |
| **Estimates of Covariance Parameters1** | | | |
| Parameter | | **Estimate** | **Std. Error** |
| Repeated Measures | Var: [treatment=R] | .184 | .041 |
| Var: [treatment=T] | .069 | .183 |
| treatment [subject = subject] | Var: [treatment=R] | .575 | .150 |
| Var: [treatment=T] | .7492 | .000 |
| CSH rho | .931 | .134 |

|  |
| --- |
| 1. Dependent Variable: lnpk. |
| 2. This covariance parameter is redundant. |

Estimated Marginal Means

treatment

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| **Estimates1** | | | | | |
| treatment | **Mean** | **Std. Error** | **df** | **90% Confidence Interval** | |
| **Lower Bound** | **Upper Bound** |
| R | 4.447 | .127 | 41.232 | 4.234 | 4.661 |
| T | 4.353 | .143 | 44.063 | 4.112 | 4.593 |

|  |
| --- |
| 1. Dependent Variable: lnpk. |

|  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- |
| **Pairwise Comparisons1** | | | | | | |
| (I) treatment | (J) treatment | **Mean Difference (I-J)** | **Std. Error** | **df** | **Sig.2** | **90% Confidence Interval for Difference2** |
| **Lower Bound** |
| T | R | -.09478922 | .09191662 | 65.46422577 | .30621753 | -.24814888 |

|  |  |  |
| --- | --- | --- |
| **Pairwise Comparisons1** | | |
| (I) treatment | (J) treatment | 90% Confidence Interval for Difference |
| **Upper Bound** |
| T | R | .05857043 |

|  |
| --- |
| Based on estimated marginal means1 |
| 1. Dependent Variable: lnpk. |
| 2. Adjustment for multiple comparisons: Least Significant Difference (equivalent to no adjustments). |

|  |  |  |  |
| --- | --- | --- | --- |
| **Univariate Tests1** | | | |
| **Numerator df** | **Denominator df** | **F** | **Sig.** |
| 1 | 65.464 | 1.063 | .306 |

|  |
| --- |
| The F tests the effect of treatment. This test is based on the linearly independent pairwise comparisons among the estimated marginal means.1 |
| 1. Dependent Variable: lnpk. |

DATASET CLOSE pkdataset.

TITLE "RDS23".

RDS23

GET DATA

/TYPE=XLSX

/FILE='.\rds01.xlsx'

/SHEET=name 'rds23'

/CELLRANGE=FULL

/READNAMES=ON

/LEADINGSPACES IGNORE=YES

/TRAILINGSPACES IGNORE=YES

/DATATYPEMIN PERCENTAGE=95.0

/HIDDEN IGNORE=YES.

EXECUTE.

DATASET NAME pkdataset WINDOW=FRONT.

COMPUTE lnpk=ln(PK).

EXECUTE.

UNIANOVA lnpk BY period sequence treatment subject

/RANDOM subject

/CONTRAST(treatment)=Simple(1)

/METHOD=SSTYPE(3)

/INTERCEPT=INCLUDE

/CRITERIA=ALPHA(0.05)

/DESIGN=period sequence treatment subject(sequence).

Univariate Analysis of Variance

|  |  |  |
| --- | --- | --- |
| **Notes** | | |
| Output Created | | 28-FEB-2021 17:55:11 |
| Comments | |  |
| Input | Active Dataset | pkdataset |
| Filter | <none> |
| Weight | <none> |
| Split File | <none> |
| N of Rows in Working Data File | 88 |
| Missing Value Handling | Definition of Missing | User-defined missing values are treated as missing. |
| Cases Used | Statistics are based on all cases with valid data for all variables in the model. |
| Syntax | | UNIANOVA lnpk BY period sequence treatment subject  /RANDOM subject  /CONTRAST(treatment)=Simple(1)  /METHOD=SSTYPE(3)  /INTERCEPT=INCLUDE  /CRITERIA=ALPHA(0.05)  /DESIGN=period sequence treatment subject(sequence). |
| Resources | Processor Time | 00:00:00.02 |
| Elapsed Time | 00:00:00.01 |

|  |  |  |
| --- | --- | --- |
| **Between-Subjects Factors** | | |
|  | | **N** |
| period | 1 | 22 |
| 2 | 22 |
| 3 | 22 |
| 4 | 22 |
| sequence | RTRT | 16 |
| RTTR | 24 |
| TRRT | 24 |
| TRTR | 24 |
| treatment | R | 44 |
| T | 44 |
| subject | 1 | 4 |
| 2 | 4 |
| 3 | 4 |
| 4 | 4 |
| 6 | 4 |
| 7 | 4 |
| 8 | 4 |
| 9 | 4 |
| 10 | 4 |
| 12 | 4 |
| 14 | 4 |
| 15 | 4 |
| 16 | 4 |
| 17 | 4 |
| 18 | 4 |
| 19 | 4 |
| 21 | 4 |
| 22 | 4 |
| 23 | 4 |
| 24 | 4 |
| 26 | 4 |
| 27 | 4 |

|  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- |
| **Tests of Between-Subjects Effects** | | | | | | |
| Dependent Variable: lnpk | | | | | | |
| Source | | **Type III Sum of Squares** | **df** | **Mean Square** | **F** | **Sig.** |
| Intercept | Hypothesis | 3026.749 | 1 | 3026.749 | 3896.878 | .000 |
| Error | 13.981 | 18 | .7771 |  |  |
| period | Hypothesis | .565 | 3 | .188 | 1.234 | .305 |
| Error | 9.455 | 62 | .1532 |  |  |
| sequence | Hypothesis | 5.089 | 3 | 1.696 | 2.184 | .125 |
| Error | 13.981 | 18 | .7771 |  |  |
| treatment | Hypothesis | .266 | 1 | .266 | 1.746 | .191 |
| Error | 9.455 | 62 | .1532 |  |  |
| subject(sequence) | Hypothesis | 13.981 | 18 | .777 | 5.093 | .000 |
| Error | 9.455 | 62 | .1532 |  |  |

|  |
| --- |
| 1. MS(subject(sequence)) |
| 2. MS(Error) |

|  |  |  |  |
| --- | --- | --- | --- |
| **Expected Mean Squares1,2** | | | |
| Source | **Variance Component** | | |
| **Var(subject(sequence))** | **Var(Error)** | **Quadratic Term** |
| Intercept | 4.000 | 1.000 | Intercept, period, sequence, treatment |
| period | .000 | 1.000 | period |
| sequence | 4.000 | 1.000 | sequence |
| treatment | .000 | 1.000 | treatment |
| subject(sequence) | 4.000 | 1.000 |  |
| Error | .000 | 1.000 |  |

|  |
| --- |
| 1. For each source, the expected mean square equals the sum of the coefficients in the cells times the variance components, plus a quadratic term involving effects in the Quadratic Term cell. |
| 2. Expected Mean Squares are based on the Type III Sums of Squares. |

Custom Hypothesis Tests

|  |  |  |  |
| --- | --- | --- | --- |
| **Contrast Results (K Matrix)** | | | |
| treatment Simple Contrast1 | | | **Dependent Variable** |
| **lnpk** |
| Level 2 vs. Level 1 | Contrast Estimate | | .110 |
| Hypothesized Value | | 0 |
| Difference (Estimate - Hypothesized) | | .110 |
| Std. Error | | .084 |
| Sig. | | .191 |
| 95% Confidence Interval for Difference | Lower Bound | -.057 |
| Upper Bound | .278 |

|  |
| --- |
| 1. Reference category = 1 |

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| **Test Results** | | | | | |
| Dependent Variable: lnpk | | | | | |
| Source | **Sum of Squares** | **df** | **Mean Square** | **F** | **Sig.** |
| Contrast | .266 | 1 | .266 | 1.746 | .191 |
| Error | 9.455 | 62 | .153 |  |  |

MIXED lnpk BY period sequence treatment subject

/CRITERIA=DFMETHOD(SATTERTHWAITE) CIN(95) MXITER(100) MXSTEP(10) SCORING(1)

SINGULAR(0.000000000001) HCONVERGE(0, ABSOLUTE) LCONVERGE(0, ABSOLUTE) PCONVERGE(0.000001, ABSOLUTE)

/FIXED=period sequence treatment | SSTYPE(3)

/METHOD=REML

/RANDOM= subject(sequence) | COVTYPE(ID)

/EMMEANS=TABLES(treatment) COMPARE REFCAT(FIRST) ADJ(LSD).

Mixed Model Analysis

|  |  |  |
| --- | --- | --- |
| **Notes** | | |
| Output Created | | 28-FEB-2021 17:55:11 |
| Comments | |  |
| Input | Active Dataset | pkdataset |
| Filter | <none> |
| Weight | <none> |
| Split File | <none> |
| N of Rows in Working Data File | 88 |
| Missing Value Handling | Definition of Missing | User-defined missing values are treated as missing. |
| Cases Used | Statistics are based on all cases with valid data for all variables in the model. |
| Syntax | | MIXED lnpk BY period sequence treatment subject  /CRITERIA=DFMETHOD(SATTERTHWAITE) CIN(95) MXITER(100) MXSTEP(10) SCORING(1)  SINGULAR(0.000000000001) HCONVERGE(0, ABSOLUTE) LCONVERGE(0, ABSOLUTE) PCONVERGE(0.000001, ABSOLUTE)  /FIXED=period sequence treatment | SSTYPE(3)  /METHOD=REML  /RANDOM= subject(sequence) | COVTYPE(ID)  /EMMEANS=TABLES(treatment) COMPARE REFCAT(FIRST) ADJ(LSD). |
| Resources | Processor Time | 00:00:00.03 |
| Elapsed Time | 00:00:00.02 |

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| **Model Dimension1** | | | | |
|  | | **Number of Levels** | **Covariance Structure** | **Number of Parameters** |
| Fixed Effects | Intercept | 1 |  | 1 |
| period | 4 |  | 3 |
| sequence | 4 |  | 3 |
| treatment | 2 |  | 1 |
| Random Effects | subject(sequence) | 22 | Identity | 1 |
| Residual | |  |  | 1 |
| Total | | 33 |  | 10 |

|  |
| --- |
| 1. Dependent Variable: lnpk. |

|  |  |
| --- | --- |
| **Information Criteria1** | |
| -2 Restricted Log Likelihood | 129.16329544 |
| Akaike's Information Criterion (AIC) | 133.16329544 |
| Hurvich and Tsai's Criterion (AICC) | 133.31913960 |
| Bozdogan's Criterion (CAIC) | 139.92734871 |
| Schwarz's Bayesian Criterion (BIC) | 137.92734871 |

|  |
| --- |
| The information criteria are displayed in smaller-is-better form.1 |
| 1. Dependent Variable: lnpk. |

Fixed Effects

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| **Type III Tests of Fixed Effects1** | | | | |
| Source | **Numerator df** | **Denominator df** | **F** | **Sig.** |
| Intercept | 1 | 18 | 3852.347 | .000 |
| period | 3 | 62 | 1.234 | .305 |
| sequence | 3 | 18 | 2.184 | .125 |
| treatment | 1 | 62 | 1.746 | .191 |

|  |
| --- |
| 1. Dependent Variable: lnpk. |

Covariance Parameters

|  |  |  |  |
| --- | --- | --- | --- |
| **Estimates of Covariance Parameters1** | | | |
| Parameter | | **Estimate** | **Std. Error** |
| Residual | | .152504 | .027391 |
| subject(sequence) | Variance | .156052 | .065087 |

|  |
| --- |
| 1. Dependent Variable: lnpk. |

Estimated Marginal Means

treatment

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| **Estimates1** | | | | | |
| treatment | **Mean** | **Std. Error** | **df** | **95% Confidence Interval** | |
| **Lower Bound** | **Upper Bound** |
| R | 5.866 | .104 | 25.304 | 5.652 | 6.081 |
| T | 5.977 | .104 | 25.304 | 5.762 | 6.191 |

|  |
| --- |
| 1. Dependent Variable: lnpk. |

|  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- |
| **Pairwise Comparisons1** | | | | | | |
| (I) treatment | (J) treatment | **Mean Difference (I-J)** | **Std. Error** | **df** | **Sig.2** | **95% Confidence Interval for Difference2** |
| **Lower Bound** |
| T | R | .11048285 | .08360493 | 62.00000000 | .19119480 | -.05664102 |

|  |  |  |
| --- | --- | --- |
| **Pairwise Comparisons1** | | |
| (I) treatment | (J) treatment | 95% Confidence Interval for Difference |
| **Upper Bound** |
| T | R | .27760673 |

|  |
| --- |
| Based on estimated marginal means1 |
| 1. Dependent Variable: lnpk. |
| 2. Adjustment for multiple comparisons: Least Significant Difference (equivalent to no adjustments). |

|  |  |  |  |
| --- | --- | --- | --- |
| **Univariate Tests1** | | | |
| **Numerator df** | **Denominator df** | **F** | **Sig.** |
| 1 | 62 | 1.746 | .191 |

|  |
| --- |
| The F tests the effect of treatment. This test is based on the linearly independent pairwise comparisons among the estimated marginal means.1 |
| 1. Dependent Variable: lnpk. |

MIXED lnpk BY period treatment sequence subject

/CRITERIA=CIN(90) MXITER(200) MXSTEP(20) SCORING(2) SINGULAR(0.000000000001) HCONVERGE(0,

RELATIVE) LCONVERGE(0.0000000000001, RELATIVE) PCONVERGE(0, RELATIVE)

/FIXED=period treatment sequence | SSTYPE(3)

/METHOD=REML

/RANDOM=treatment | SUBJECT(subject) COVTYPE(CSH)

/REPEATED=treatment | SUBJECT(subject\*period) COVTYPE(DIAG)

/EMMEANS=TABLES(treatment) COMPARE REFCAT(FIRST) ADJ(LSD).

Mixed Model Analysis

|  |  |  |
| --- | --- | --- |
| **Notes** | | |
| Output Created | | 28-FEB-2021 17:55:11 |
| Comments | |  |
| Input | Active Dataset | pkdataset |
| Filter | <none> |
| Weight | <none> |
| Split File | <none> |
| N of Rows in Working Data File | 88 |
| Missing Value Handling | Definition of Missing | User-defined missing values are treated as missing. |
| Cases Used | Statistics are based on all cases with valid data for all variables in the model. |
| Syntax | | MIXED lnpk BY period treatment sequence subject  /CRITERIA=CIN(90) MXITER(200) MXSTEP(20) SCORING(2) SINGULAR(0.000000000001) HCONVERGE(0,  RELATIVE) LCONVERGE(0.0000000000001, RELATIVE) PCONVERGE(0, RELATIVE)  /FIXED=period treatment sequence | SSTYPE(3)  /METHOD=REML  /RANDOM=treatment | SUBJECT(subject) COVTYPE(CSH)  /REPEATED=treatment | SUBJECT(subject\*period) COVTYPE(DIAG)  /EMMEANS=TABLES(treatment) COMPARE REFCAT(FIRST) ADJ(LSD). |
| Resources | Processor Time | 00:00:00.05 |
| Elapsed Time | 00:00:00.05 |

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| **Model Dimension1** | | | | | |
|  | | **Number of Levels** | **Covariance Structure** | **Number of Parameters** | **Subject Variables** |
| Fixed Effects | Intercept | 1 |  | 1 |  |
| period | 4 |  | 3 |  |
| treatment | 2 |  | 1 |  |
| sequence | 4 |  | 3 |  |
| Random Effects | treatment | 2 | Heterogeneous Compound Symmetry | 3 | subject |
| Repeated Effects | treatment | 2 | Diagonal | 2 | subject \* period |
| Total | | 15 |  | 13 |  |

|  |  |  |
| --- | --- | --- |
| **Model Dimension1** | | |
|  | | **Number of Subjects** |
| Fixed Effects | Intercept |  |
| period |  |
| treatment |  |
| sequence |  |
| Random Effects | treatment |  |
| Repeated Effects | treatment | 88 |
| Total | |  |

|  |
| --- |
| 1. Dependent Variable: lnpk. |

|  |  |
| --- | --- |
| **Information Criteria1** | |
| -2 Restricted Log Likelihood | 119.80621158 |
| Akaike's Information Criterion (AIC) | 129.80621158 |
| Hurvich and Tsai's Criterion (AICC) | 130.61702239 |
| Bozdogan's Criterion (CAIC) | 146.71634475 |
| Schwarz's Bayesian Criterion (BIC) | 141.71634475 |

|  |
| --- |
| The information criteria are displayed in smaller-is-better form.1 |
| 1. Dependent Variable: lnpk. |

Fixed Effects

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| **Type III Tests of Fixed Effects1** | | | | |
| Source | **Numerator df** | **Denominator df** | **F** | **Sig.** |
| Intercept | 1 | 17.996 | 3852.332 | .000 |
| period | 3 | 40.385 | 1.793 | .164 |
| treatment | 1 | 15.631 | 1.521 | .236 |
| sequence | 3 | 18.002 | 2.250 | .117 |

|  |
| --- |
| 1. Dependent Variable: lnpk. |

Covariance Parameters

|  |  |  |  |
| --- | --- | --- | --- |
| **Estimates of Covariance Parameters1** | | | |
| Parameter | | **Estimate** | **Std. Error** |
| Repeated Measures | Var: [treatment=R] | .228 | .070 |
| Var: [treatment=T] | .057 | .019 |
| treatment [subject = subject] | Var: [treatment=R] | .127 | .092 |
| Var: [treatment=T] | .205 | .082 |
| CSH rho | .934 | .254 |

|  |
| --- |
| 1. Dependent Variable: lnpk. |

Estimated Marginal Means

treatment

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| **Estimates1** | | | | | |
| treatment | **Mean** | **Std. Error** | **df** | **90% Confidence Interval** | |
| **Lower Bound** | **Upper Bound** |
| R | 5.867 | .106 | 16.614 | 5.682 | 6.052 |
| T | 5.977 | .104 | 16.763 | 5.795 | 6.158 |

|  |
| --- |
| 1. Dependent Variable: lnpk. |

|  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- |
| **Pairwise Comparisons1** | | | | | | |
| (I) treatment | (J) treatment | **Mean Difference (I-J)** | **Std. Error** | **df** | **Sig.2** | **90% Confidence Interval for Difference2** |
| **Lower Bound** |
| T | R | .10954733 | .08883474 | 15.63130439 | .23574022 | -.04577247 |

|  |  |  |
| --- | --- | --- |
| **Pairwise Comparisons1** | | |
| (I) treatment | (J) treatment | 90% Confidence Interval for Difference |
| **Upper Bound** |
| T | R | .26486713 |

|  |
| --- |
| Based on estimated marginal means1 |
| 1. Dependent Variable: lnpk. |
| 2. Adjustment for multiple comparisons: Least Significant Difference (equivalent to no adjustments). |

|  |  |  |  |
| --- | --- | --- | --- |
| **Univariate Tests1** | | | |
| **Numerator df** | **Denominator df** | **F** | **Sig.** |
| 1 | 15.631 | 1.521 | .236 |

|  |
| --- |
| The F tests the effect of treatment. This test is based on the linearly independent pairwise comparisons among the estimated marginal means.1 |
| 1. Dependent Variable: lnpk. |

DATASET CLOSE pkdataset.

TITLE "RDS24".

RDS24

GET DATA

/TYPE=XLSX

/FILE='.\rds01.xlsx'

/SHEET=name 'rds24'

/CELLRANGE=FULL

/READNAMES=ON

/LEADINGSPACES IGNORE=YES

/TRAILINGSPACES IGNORE=YES

/DATATYPEMIN PERCENTAGE=95.0

/HIDDEN IGNORE=YES.

EXECUTE.

DATASET NAME pkdataset WINDOW=FRONT.

COMPUTE lnpk=ln(PK).

EXECUTE.

UNIANOVA lnpk BY period sequence treatment subject

/RANDOM subject

/CONTRAST(treatment)=Simple(1)

/METHOD=SSTYPE(3)

/INTERCEPT=INCLUDE

/CRITERIA=ALPHA(0.05)

/DESIGN=period sequence treatment subject(sequence).

Univariate Analysis of Variance

|  |  |  |
| --- | --- | --- |
| **Notes** | | |
| Output Created | | 28-FEB-2021 17:55:11 |
| Comments | |  |
| Input | Active Dataset | pkdataset |
| Filter | <none> |
| Weight | <none> |
| Split File | <none> |
| N of Rows in Working Data File | 160 |
| Missing Value Handling | Definition of Missing | User-defined missing values are treated as missing. |
| Cases Used | Statistics are based on all cases with valid data for all variables in the model. |
| Syntax | | UNIANOVA lnpk BY period sequence treatment subject  /RANDOM subject  /CONTRAST(treatment)=Simple(1)  /METHOD=SSTYPE(3)  /INTERCEPT=INCLUDE  /CRITERIA=ALPHA(0.05)  /DESIGN=period sequence treatment subject(sequence). |
| Resources | Processor Time | 00:00:00.02 |
| Elapsed Time | 00:00:00.03 |

|  |  |  |
| --- | --- | --- |
| **Between-Subjects Factors** | | |
|  | | **N** |
| period | 1 | 39 |
| 2 | 39 |
| 3 | 39 |
| 4 | 39 |
| sequence | RRTT | 40 |
| RTTR | 40 |
| TRRT | 36 |
| TTRR | 40 |
| treatment | R | 78 |
| T | 78 |
| subject | 1 | 4 |
| 2 | 4 |
| 3 | 4 |
| 4 | 4 |
| 5 | 4 |
| 7 | 4 |
| 9 | 4 |
| 10 | 4 |
| 11 | 4 |
| 12 | 4 |
| 13 | 4 |
| 14 | 4 |
| 15 | 4 |
| 17 | 4 |
| 18 | 4 |
| 19 | 4 |
| 20 | 4 |
| 22 | 4 |
| 23 | 4 |
| 24 | 4 |
| 25 | 4 |
| 26 | 4 |
| 27 | 4 |
| 28 | 4 |
| 29 | 4 |
| 30 | 4 |
| 31 | 4 |
| 33 | 4 |
| 34 | 4 |
| 35 | 4 |
| 36 | 4 |
| 37 | 4 |
| 38 | 4 |
| 39 | 4 |
| 40 | 4 |
| 906 | 4 |
| 908 | 4 |
| 921 | 4 |
| 932 | 4 |

|  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- |
| **Tests of Between-Subjects Effects** | | | | | | |
| Dependent Variable: lnpk | | | | | | |
| Source | | **Type III Sum of Squares** | **df** | **Mean Square** | **F** | **Sig.** |
| Intercept | Hypothesis | 275.611 | 1 | 275.611 | 137.282 | .000 |
| Error | 70.267 | 35 | 2.0081 |  |  |
| period | Hypothesis | 1.028 | 3 | .343 | 1.821 | .147 |
| Error | 21.270 | 113 | .1882 |  |  |
| sequence | Hypothesis | 6.998 | 3 | 2.333 | 1.162 | .338 |
| Error | 70.267 | 35 | 2.0081 |  |  |
| treatment | Hypothesis | .018 | 1 | .018 | .094 | .760 |
| Error | 21.270 | 113 | .1882 |  |  |
| subject(sequence) | Hypothesis | 70.267 | 35 | 2.008 | 10.666 | .000 |
| Error | 21.270 | 113 | .1882 |  |  |

|  |
| --- |
| 1. MS(subject(sequence)) |
| 2. MS(Error) |

|  |  |  |  |
| --- | --- | --- | --- |
| **Expected Mean Squares1,2** | | | |
| Source | **Variance Component** | | |
| **Var(subject(sequence))** | **Var(Error)** | **Quadratic Term** |
| Intercept | 4.000 | 1.000 | Intercept, period, sequence, treatment |
| period | .000 | 1.000 | period |
| sequence | 4.000 | 1.000 | sequence |
| treatment | .000 | 1.000 | treatment |
| subject(sequence) | 4.000 | 1.000 |  |
| Error | .000 | 1.000 |  |

|  |
| --- |
| 1. For each source, the expected mean square equals the sum of the coefficients in the cells times the variance components, plus a quadratic term involving effects in the Quadratic Term cell. |
| 2. Expected Mean Squares are based on the Type III Sums of Squares. |

Custom Hypothesis Tests

|  |  |  |  |
| --- | --- | --- | --- |
| **Contrast Results (K Matrix)** | | | |
| treatment Simple Contrast1 | | | **Dependent Variable** |
| **lnpk** |
| Level 2 vs. Level 1 | Contrast Estimate | | -.021 |
| Hypothesized Value | | 0 |
| Difference (Estimate - Hypothesized) | | -.021 |
| Std. Error | | .069 |
| Sig. | | .760 |
| 95% Confidence Interval for Difference | Lower Bound | -.159 |
| Upper Bound | .116 |

|  |
| --- |
| 1. Reference category = 1 |

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| **Test Results** | | | | | |
| Dependent Variable: lnpk | | | | | |
| Source | **Sum of Squares** | **df** | **Mean Square** | **F** | **Sig.** |
| Contrast | .018 | 1 | .018 | .094 | .760 |
| Error | 21.270 | 113 | .188 |  |  |

MIXED lnpk BY period sequence treatment subject

/CRITERIA=DFMETHOD(SATTERTHWAITE) CIN(95) MXITER(100) MXSTEP(10) SCORING(1)

SINGULAR(0.000000000001) HCONVERGE(0, ABSOLUTE) LCONVERGE(0, ABSOLUTE) PCONVERGE(0.000001, ABSOLUTE)

/FIXED=period sequence treatment | SSTYPE(3)

/METHOD=REML

/RANDOM= subject(sequence) | COVTYPE(ID)

/EMMEANS=TABLES(treatment) COMPARE REFCAT(FIRST) ADJ(LSD).

Mixed Model Analysis

|  |  |  |
| --- | --- | --- |
| **Notes** | | |
| Output Created | | 28-FEB-2021 17:55:11 |
| Comments | |  |
| Input | Active Dataset | pkdataset |
| Filter | <none> |
| Weight | <none> |
| Split File | <none> |
| N of Rows in Working Data File | 160 |
| Missing Value Handling | Definition of Missing | User-defined missing values are treated as missing. |
| Cases Used | Statistics are based on all cases with valid data for all variables in the model. |
| Syntax | | MIXED lnpk BY period sequence treatment subject  /CRITERIA=DFMETHOD(SATTERTHWAITE) CIN(95) MXITER(100) MXSTEP(10) SCORING(1)  SINGULAR(0.000000000001) HCONVERGE(0, ABSOLUTE) LCONVERGE(0, ABSOLUTE) PCONVERGE(0.000001, ABSOLUTE)  /FIXED=period sequence treatment | SSTYPE(3)  /METHOD=REML  /RANDOM= subject(sequence) | COVTYPE(ID)  /EMMEANS=TABLES(treatment) COMPARE REFCAT(FIRST) ADJ(LSD). |
| Resources | Processor Time | 00:00:00.05 |
| Elapsed Time | 00:00:00.03 |

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| **Model Dimension1** | | | | |
|  | | **Number of Levels** | **Covariance Structure** | **Number of Parameters** |
| Fixed Effects | Intercept | 1 |  | 1 |
| period | 4 |  | 3 |
| sequence | 4 |  | 3 |
| treatment | 2 |  | 1 |
| Random Effects | subject(sequence) | 39 | Identity | 1 |
| Residual | |  |  | 1 |
| Total | | 50 |  | 10 |

|  |
| --- |
| 1. Dependent Variable: lnpk. |

|  |  |
| --- | --- |
| **Information Criteria1** | |
| -2 Restricted Log Likelihood | 283.59476106 |
| Akaike's Information Criterion (AIC) | 287.59476106 |
| Hurvich and Tsai's Criterion (AICC) | 287.67751968 |
| Bozdogan's Criterion (CAIC) | 295.58918561 |
| Schwarz's Bayesian Criterion (BIC) | 293.58918561 |

|  |
| --- |
| The information criteria are displayed in smaller-is-better form.1 |
| 1. Dependent Variable: lnpk. |

Fixed Effects

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| **Type III Tests of Fixed Effects1** | | | | |
| Source | **Numerator df** | **Denominator df** | **F** | **Sig.** |
| Intercept | 1 | 35 | 137.313 | .000 |
| period | 3 | 113.000 | 1.821 | .147 |
| sequence | 3 | 35 | 1.162 | .338 |
| treatment | 1 | 113.000 | .094 | .760 |

|  |
| --- |
| 1. Dependent Variable: lnpk. |

Covariance Parameters

|  |  |  |  |
| --- | --- | --- | --- |
| **Estimates of Covariance Parameters1** | | | |
| Parameter | | **Estimate** | **Std. Error** |
| Residual | | .188227 | .025041 |
| subject(sequence) | Variance | .454850 | .120142 |

|  |
| --- |
| 1. Dependent Variable: lnpk. |

Estimated Marginal Means

treatment

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| **Estimates1** | | | | | |
| treatment | **Mean** | **Std. Error** | **df** | **95% Confidence Interval** | |
| **Lower Bound** | **Upper Bound** |
| R | 1.341 | .119 | 41.747 | 1.102 | 1.581 |
| T | 1.320 | .119 | 41.747 | 1.080 | 1.560 |

|  |
| --- |
| 1. Dependent Variable: lnpk. |

|  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- |
| **Pairwise Comparisons1** | | | | | | |
| (I) treatment | (J) treatment | **Mean Difference (I-J)** | **Std. Error** | **df** | **Sig.2** | **95% Confidence Interval for Difference2** |
| **Lower Bound** |
| T | R | -.02127816 | .06949472 | 113.00000000 | .76002805 | -.15895974 |

|  |  |  |
| --- | --- | --- |
| **Pairwise Comparisons1** | | |
| (I) treatment | (J) treatment | 95% Confidence Interval for Difference |
| **Upper Bound** |
| T | R | .11640341 |

|  |
| --- |
| Based on estimated marginal means1 |
| 1. Dependent Variable: lnpk. |
| 2. Adjustment for multiple comparisons: Least Significant Difference (equivalent to no adjustments). |

|  |  |  |  |
| --- | --- | --- | --- |
| **Univariate Tests1** | | | |
| **Numerator df** | **Denominator df** | **F** | **Sig.** |
| 1 | 113.000 | .094 | .760 |

|  |
| --- |
| The F tests the effect of treatment. This test is based on the linearly independent pairwise comparisons among the estimated marginal means.1 |
| 1. Dependent Variable: lnpk. |

MIXED lnpk BY period treatment sequence subject

/CRITERIA=CIN(90) MXITER(200) MXSTEP(20) SCORING(2) SINGULAR(0.000000000001) HCONVERGE(0,

RELATIVE) LCONVERGE(0.0000000000001, RELATIVE) PCONVERGE(0, RELATIVE)

/FIXED=period treatment sequence | SSTYPE(3)

/METHOD=REML

/RANDOM=treatment | SUBJECT(subject) COVTYPE(CSH)

/REPEATED=treatment | SUBJECT(subject\*period) COVTYPE(DIAG)

/EMMEANS=TABLES(treatment) COMPARE REFCAT(FIRST) ADJ(LSD).

Mixed Model Analysis

|  |  |  |
| --- | --- | --- |
| **Notes** | | |
| Output Created | | 28-FEB-2021 17:55:12 |
| Comments | |  |
| Input | Active Dataset | pkdataset |
| Filter | <none> |
| Weight | <none> |
| Split File | <none> |
| N of Rows in Working Data File | 160 |
| Missing Value Handling | Definition of Missing | User-defined missing values are treated as missing. |
| Cases Used | Statistics are based on all cases with valid data for all variables in the model. |
| Syntax | | MIXED lnpk BY period treatment sequence subject  /CRITERIA=CIN(90) MXITER(200) MXSTEP(20) SCORING(2) SINGULAR(0.000000000001) HCONVERGE(0,  RELATIVE) LCONVERGE(0.0000000000001, RELATIVE) PCONVERGE(0, RELATIVE)  /FIXED=period treatment sequence | SSTYPE(3)  /METHOD=REML  /RANDOM=treatment | SUBJECT(subject) COVTYPE(CSH)  /REPEATED=treatment | SUBJECT(subject\*period) COVTYPE(DIAG)  /EMMEANS=TABLES(treatment) COMPARE REFCAT(FIRST) ADJ(LSD). |
| Resources | Processor Time | 00:00:00.06 |
| Elapsed Time | 00:00:00.07 |

|  |
| --- |
| **Warnings** |
| The final Hessian matrix is not positive definite although all convergence criteria are satisfied. The MIXED procedure continues despite this warning. Validity of subsequent results cannot be ascertained. |

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| **Model Dimension1** | | | | | |
|  | | **Number of Levels** | **Covariance Structure** | **Number of Parameters** | **Subject Variables** |
| Fixed Effects | Intercept | 1 |  | 1 |  |
| period | 4 |  | 3 |  |
| treatment | 2 |  | 1 |  |
| sequence | 4 |  | 3 |  |
| Random Effects | treatment | 2 | Heterogeneous Compound Symmetry | 3 | subject |
| Repeated Effects | treatment | 2 | Diagonal | 2 | subject \* period |
| Total | | 15 |  | 13 |  |

|  |  |  |
| --- | --- | --- |
| **Model Dimension1** | | |
|  | | **Number of Subjects** |
| Fixed Effects | Intercept |  |
| period |  |
| treatment |  |
| sequence |  |
| Random Effects | treatment |  |
| Repeated Effects | treatment | 156 |
| Total | |  |

|  |
| --- |
| 1. Dependent Variable: lnpk. |

|  |  |
| --- | --- |
| **Information Criteria1** | |
| -2 Restricted Log Likelihood | 274.30636136 |
| Akaike's Information Criterion (AIC) | 284.30636136 |
| Hurvich and Tsai's Criterion (AICC) | 284.72889657 |
| Bozdogan's Criterion (CAIC) | 304.29242273 |
| Schwarz's Bayesian Criterion (BIC) | 299.29242273 |

|  |
| --- |
| The information criteria are displayed in smaller-is-better form.1 |
| 1. Dependent Variable: lnpk. |

Fixed Effects

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| **Type III Tests of Fixed Effects1** | | | | |
| Source | **Numerator df** | **Denominator df** | **F** | **Sig.** |
| Intercept | 1 | 23.932 | 137.106 | .000 |
| period | 3 | 98.052 | 3.317 | .023 |
| treatment | 1 | 130.027 | .087 | .768 |
| sequence | 3 | 29.461 | .966 | .422 |

|  |
| --- |
| 1. Dependent Variable: lnpk. |

Covariance Parameters

|  |  |  |  |
| --- | --- | --- | --- |
| **Estimates of Covariance Parameters1** | | | |
| Parameter | | **Estimate** | **Std. Error** |
| Repeated Measures | Var: [treatment=R] | .248 | .045 |
| Var: [treatment=T] | .107 | .025 |
| treatment [subject = subject] | Var: [treatment=R] | .349 | .111 |
| Var: [treatment=T] | .584 | .153 |
| CSH rho | 1.0002 | .000 |

|  |
| --- |
| 1. Dependent Variable: lnpk. |
| 2. This covariance parameter is redundant. |

Estimated Marginal Means

treatment

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| **Estimates1** | | | | | |
| treatment | **Mean** | **Std. Error** | **df** | **90% Confidence Interval** | |
| **Lower Bound** | **Upper Bound** |
| R | 1.342 | .110 | 35.990 | 1.156 | 1.528 |
| T | 1.321 | .128 | 23.431 | 1.101 | 1.540 |

|  |
| --- |
| 1. Dependent Variable: lnpk. |

|  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- |
| **Pairwise Comparisons1** | | | | | | |
| (I) treatment | (J) treatment | **Mean Difference (I-J)** | **Std. Error** | **df** | **Sig.2** | **90% Confidence Interval for Difference2** |
| **Lower Bound** |
| T | R | -.02159624 | .07300969 | 130.02733695 | .76785496 | -.14254824 |

|  |  |  |
| --- | --- | --- |
| **Pairwise Comparisons1** | | |
| (I) treatment | (J) treatment | 90% Confidence Interval for Difference |
| **Upper Bound** |
| T | R | .09935576 |

|  |
| --- |
| Based on estimated marginal means1 |
| 1. Dependent Variable: lnpk. |
| 2. Adjustment for multiple comparisons: Least Significant Difference (equivalent to no adjustments). |

|  |  |  |  |
| --- | --- | --- | --- |
| **Univariate Tests1** | | | |
| **Numerator df** | **Denominator df** | **F** | **Sig.** |
| 1 | 130.027 | .087 | .768 |

|  |
| --- |
| The F tests the effect of treatment. This test is based on the linearly independent pairwise comparisons among the estimated marginal means.1 |
| 1. Dependent Variable: lnpk. |

DATASET CLOSE pkdataset.

TITLE "RDS25".

RDS25

GET DATA

/TYPE=XLSX

/FILE='.\rds01.xlsx'

/SHEET=name 'rds25'

/CELLRANGE=FULL

/READNAMES=ON

/LEADINGSPACES IGNORE=YES

/TRAILINGSPACES IGNORE=YES

/DATATYPEMIN PERCENTAGE=95.0

/HIDDEN IGNORE=YES.

EXECUTE.

DATASET NAME pkdataset WINDOW=FRONT.

COMPUTE lnpk=ln(PK).

EXECUTE.

UNIANOVA lnpk BY period sequence treatment subject

/RANDOM subject

/CONTRAST(treatment)=Simple(1)

/METHOD=SSTYPE(3)

/INTERCEPT=INCLUDE

/CRITERIA=ALPHA(0.05)

/DESIGN=period sequence treatment subject(sequence).

Univariate Analysis of Variance

|  |  |  |
| --- | --- | --- |
| **Notes** | | |
| Output Created | | 28-FEB-2021 17:55:12 |
| Comments | |  |
| Input | Active Dataset | pkdataset |
| Filter | <none> |
| Weight | <none> |
| Split File | <none> |
| N of Rows in Working Data File | 280 |
| Missing Value Handling | Definition of Missing | User-defined missing values are treated as missing. |
| Cases Used | Statistics are based on all cases with valid data for all variables in the model. |
| Syntax | | UNIANOVA lnpk BY period sequence treatment subject  /RANDOM subject  /CONTRAST(treatment)=Simple(1)  /METHOD=SSTYPE(3)  /INTERCEPT=INCLUDE  /CRITERIA=ALPHA(0.05)  /DESIGN=period sequence treatment subject(sequence). |
| Resources | Processor Time | 00:00:00.05 |
| Elapsed Time | 00:00:00.04 |

|  |  |  |
| --- | --- | --- |
| **Between-Subjects Factors** | | |
|  | | **N** |
| period | 1 | 70 |
| 2 | 70 |
| 3 | 70 |
| 4 | 70 |
| sequence | RTRT | 140 |
| TRTR | 140 |
| treatment | R | 140 |
| T | 140 |
| subject | 1 | 4 |
| 2 | 4 |
| 3 | 4 |
| 4 | 4 |
| 5 | 4 |
| 6 | 4 |
| 7 | 4 |
| 8 | 4 |
| 9 | 4 |
| 10 | 4 |
| 11 | 4 |
| 12 | 4 |
| 13 | 4 |
| 14 | 4 |
| 15 | 4 |
| 16 | 4 |
| 17 | 4 |
| 18 | 4 |
| 19 | 4 |
| 20 | 4 |
| 21 | 4 |
| 22 | 4 |
| 23 | 4 |
| 24 | 4 |
| 25 | 4 |
| 26 | 4 |
| 27 | 4 |
| 28 | 4 |
| 29 | 4 |
| 30 | 4 |
| 31 | 4 |
| 32 | 4 |
| 33 | 4 |
| 34 | 4 |
| 35 | 4 |
| 36 | 4 |
| 37 | 4 |
| 38 | 4 |
| 39 | 4 |
| 40 | 4 |
| 41 | 4 |
| 42 | 4 |
| 43 | 4 |
| 44 | 4 |
| 45 | 4 |
| 46 | 4 |
| 47 | 4 |
| 48 | 4 |
| 49 | 4 |
| 50 | 4 |
| 51 | 4 |
| 52 | 4 |
| 53 | 4 |
| 54 | 4 |
| 55 | 4 |
| 56 | 4 |
| 57 | 4 |
| 58 | 4 |
| 59 | 4 |
| 60 | 4 |
| 61 | 4 |
| 62 | 4 |
| 63 | 4 |
| 64 | 4 |
| 65 | 4 |
| 66 | 4 |
| 67 | 4 |
| 68 | 4 |
| 69 | 4 |
| 70 | 4 |

|  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- |
| **Tests of Between-Subjects Effects** | | | | | | |
| Dependent Variable: lnpk | | | | | | |
| Source | | **Type III Sum of Squares** | **df** | **Mean Square** | **F** | **Sig.** |
| Intercept | Hypothesis | 5763.174 | 1 | 5763.174 | 1362.483 | .000 |
| Error | 287.634 | 68 | 4.2301 |  |  |
| period | Hypothesis | 2.762 | 3 | .921 | 2.710 | .046 |
| Error | 69.987 | 206 | .3402 |  |  |
| sequence | Hypothesis | 1.671 | 1 | 1.671 | .395 | .532 |
| Error | 287.634 | 68 | 4.2301 |  |  |
| treatment | Hypothesis | 1.262 | 1 | 1.262 | 3.715 | .055 |
| Error | 69.987 | 206 | .3402 |  |  |
| subject(sequence) | Hypothesis | 287.634 | 68 | 4.230 | 12.450 | .000 |
| Error | 69.987 | 206 | .3402 |  |  |

|  |
| --- |
| 1. MS(subject(sequence)) |
| 2. MS(Error) |

|  |  |  |  |
| --- | --- | --- | --- |
| **Expected Mean Squares1,2** | | | |
| Source | **Variance Component** | | |
| **Var(subject(sequence))** | **Var(Error)** | **Quadratic Term** |
| Intercept | 4.000 | 1.000 | Intercept, period, sequence, treatment |
| period | .000 | 1.000 | period |
| sequence | 4.000 | 1.000 | sequence |
| treatment | .000 | 1.000 | treatment |
| subject(sequence) | 4.000 | 1.000 |  |
| Error | .000 | 1.000 |  |

|  |
| --- |
| 1. For each source, the expected mean square equals the sum of the coefficients in the cells times the variance components, plus a quadratic term involving effects in the Quadratic Term cell. |
| 2. Expected Mean Squares are based on the Type III Sums of Squares. |

Custom Hypothesis Tests

|  |  |  |  |
| --- | --- | --- | --- |
| **Contrast Results (K Matrix)** | | | |
| treatment Simple Contrast1 | | | **Dependent Variable** |
| **lnpk** |
| Level 2 vs. Level 1 | Contrast Estimate | | -.134 |
| Hypothesized Value | | 0 |
| Difference (Estimate - Hypothesized) | | -.134 |
| Std. Error | | .070 |
| Sig. | | .055 |
| 95% Confidence Interval for Difference | Lower Bound | -.272 |
| Upper Bound | .003 |

|  |
| --- |
| 1. Reference category = 1 |

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| **Test Results** | | | | | |
| Dependent Variable: lnpk | | | | | |
| Source | **Sum of Squares** | **df** | **Mean Square** | **F** | **Sig.** |
| Contrast | 1.262 | 1 | 1.262 | 3.715 | .055 |
| Error | 69.987 | 206 | .340 |  |  |

MIXED lnpk BY period sequence treatment subject

/CRITERIA=DFMETHOD(SATTERTHWAITE) CIN(95) MXITER(100) MXSTEP(10) SCORING(1)

SINGULAR(0.000000000001) HCONVERGE(0, ABSOLUTE) LCONVERGE(0, ABSOLUTE) PCONVERGE(0.000001, ABSOLUTE)

/FIXED=period sequence treatment | SSTYPE(3)

/METHOD=REML

/RANDOM= subject(sequence) | COVTYPE(ID)

/EMMEANS=TABLES(treatment) COMPARE REFCAT(FIRST) ADJ(LSD).

Mixed Model Analysis

|  |  |  |
| --- | --- | --- |
| **Notes** | | |
| Output Created | | 28-FEB-2021 17:55:12 |
| Comments | |  |
| Input | Active Dataset | pkdataset |
| Filter | <none> |
| Weight | <none> |
| Split File | <none> |
| N of Rows in Working Data File | 280 |
| Missing Value Handling | Definition of Missing | User-defined missing values are treated as missing. |
| Cases Used | Statistics are based on all cases with valid data for all variables in the model. |
| Syntax | | MIXED lnpk BY period sequence treatment subject  /CRITERIA=DFMETHOD(SATTERTHWAITE) CIN(95) MXITER(100) MXSTEP(10) SCORING(1)  SINGULAR(0.000000000001) HCONVERGE(0, ABSOLUTE) LCONVERGE(0, ABSOLUTE) PCONVERGE(0.000001, ABSOLUTE)  /FIXED=period sequence treatment | SSTYPE(3)  /METHOD=REML  /RANDOM= subject(sequence) | COVTYPE(ID)  /EMMEANS=TABLES(treatment) COMPARE REFCAT(FIRST) ADJ(LSD). |
| Resources | Processor Time | 00:00:00.09 |
| Elapsed Time | 00:00:00.09 |

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| **Model Dimension1** | | | | |
|  | | **Number of Levels** | **Covariance Structure** | **Number of Parameters** |
| Fixed Effects | Intercept | 1 |  | 1 |
| period | 4 |  | 3 |
| sequence | 2 |  | 1 |
| treatment | 2 |  | 1 |
| Random Effects | subject(sequence) | 70 | Identity | 1 |
| Residual | |  |  | 1 |
| Total | | 79 |  | 8 |

|  |
| --- |
| 1. Dependent Variable: lnpk. |

|  |  |
| --- | --- |
| **Information Criteria1** | |
| -2 Restricted Log Likelihood | 678.74530619 |
| Akaike's Information Criterion (AIC) | 682.74530619 |
| Hurvich and Tsai's Criterion (AICC) | 682.78958663 |
| Bozdogan's Criterion (CAIC) | 691.97156240 |
| Schwarz's Bayesian Criterion (BIC) | 689.97156240 |

|  |
| --- |
| The information criteria are displayed in smaller-is-better form.1 |
| 1. Dependent Variable: lnpk. |

Fixed Effects

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| **Type III Tests of Fixed Effects1** | | | | |
| Source | **Numerator df** | **Denominator df** | **F** | **Sig.** |
| Intercept | 1 | 68 | 1362.483 | .000 |
| period | 3 | 206 | 2.710 | .046 |
| sequence | 1 | 68 | .395 | .532 |
| treatment | 1 | 206 | 3.715 | .055 |

|  |
| --- |
| 1. Dependent Variable: lnpk. |

Covariance Parameters

|  |  |  |  |
| --- | --- | --- | --- |
| **Estimates of Covariance Parameters1** | | | |
| Parameter | | **Estimate** | **Std. Error** |
| Residual | | .339740 | .033476 |
| subject(sequence) | Variance | .972541 | .181549 |

|  |
| --- |
| 1. Dependent Variable: lnpk. |

Estimated Marginal Means

treatment

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| **Estimates1** | | | | | |
| treatment | **Mean** | **Std. Error** | **df** | **95% Confidence Interval** | |
| **Lower Bound** | **Upper Bound** |
| R | 4.604 | .128 | 79.193 | 4.350 | 4.858 |
| T | 4.470 | .128 | 79.193 | 4.215 | 4.724 |

|  |
| --- |
| 1. Dependent Variable: lnpk. |

|  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- |
| **Pairwise Comparisons1** | | | | | | |
| (I) treatment | (J) treatment | **Mean Difference (I-J)** | **Std. Error** | **df** | **Sig.2** | **95% Confidence Interval for Difference2** |
| **Lower Bound** |
| T | R | -.13427529 | .06966658 | 206.00000000 | .05530535 | -.27162621 |

|  |  |  |
| --- | --- | --- |
| **Pairwise Comparisons1** | | |
| (I) treatment | (J) treatment | 95% Confidence Interval for Difference |
| **Upper Bound** |
| T | R | .00307563 |

|  |
| --- |
| Based on estimated marginal means1 |
| 1. Dependent Variable: lnpk. |
| 2. Adjustment for multiple comparisons: Least Significant Difference (equivalent to no adjustments). |

|  |  |  |  |
| --- | --- | --- | --- |
| **Univariate Tests1** | | | |
| **Numerator df** | **Denominator df** | **F** | **Sig.** |
| 1 | 206 | 3.715 | .055 |

|  |
| --- |
| The F tests the effect of treatment. This test is based on the linearly independent pairwise comparisons among the estimated marginal means.1 |
| 1. Dependent Variable: lnpk. |

MIXED lnpk BY period treatment sequence subject

/CRITERIA=CIN(90) MXITER(200) MXSTEP(20) SCORING(2) SINGULAR(0.000000000001) HCONVERGE(0,

RELATIVE) LCONVERGE(0.0000000000001, RELATIVE) PCONVERGE(0, RELATIVE)

/FIXED=period treatment sequence | SSTYPE(3)

/METHOD=REML

/RANDOM=treatment | SUBJECT(subject) COVTYPE(CSH)

/REPEATED=treatment | SUBJECT(subject\*period) COVTYPE(DIAG)

/EMMEANS=TABLES(treatment) COMPARE REFCAT(FIRST) ADJ(LSD).

Mixed Model Analysis

|  |  |  |
| --- | --- | --- |
| **Notes** | | |
| Output Created | | 28-FEB-2021 17:55:13 |
| Comments | |  |
| Input | Active Dataset | pkdataset |
| Filter | <none> |
| Weight | <none> |
| Split File | <none> |
| N of Rows in Working Data File | 280 |
| Missing Value Handling | Definition of Missing | User-defined missing values are treated as missing. |
| Cases Used | Statistics are based on all cases with valid data for all variables in the model. |
| Syntax | | MIXED lnpk BY period treatment sequence subject  /CRITERIA=CIN(90) MXITER(200) MXSTEP(20) SCORING(2) SINGULAR(0.000000000001) HCONVERGE(0,  RELATIVE) LCONVERGE(0.0000000000001, RELATIVE) PCONVERGE(0, RELATIVE)  /FIXED=period treatment sequence | SSTYPE(3)  /METHOD=REML  /RANDOM=treatment | SUBJECT(subject) COVTYPE(CSH)  /REPEATED=treatment | SUBJECT(subject\*period) COVTYPE(DIAG)  /EMMEANS=TABLES(treatment) COMPARE REFCAT(FIRST) ADJ(LSD). |
| Resources | Processor Time | 00:00:00.09 |
| Elapsed Time | 00:00:00.12 |

|  |
| --- |
| **Warnings** |
| The final Hessian matrix is not positive definite although all convergence criteria are satisfied. The MIXED procedure continues despite this warning. Validity of subsequent results cannot be ascertained. |

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| **Model Dimension1** | | | | | |
|  | | **Number of Levels** | **Covariance Structure** | **Number of Parameters** | **Subject Variables** |
| Fixed Effects | Intercept | 1 |  | 1 |  |
| period | 4 |  | 3 |  |
| treatment | 2 |  | 1 |  |
| sequence | 2 |  | 1 |  |
| Random Effects | treatment | 2 | Heterogeneous Compound Symmetry | 3 | subject |
| Repeated Effects | treatment | 2 | Diagonal | 2 | subject \* period |
| Total | | 13 |  | 11 |  |

|  |  |  |
| --- | --- | --- |
| **Model Dimension1** | | |
|  | | **Number of Subjects** |
| Fixed Effects | Intercept |  |
| period |  |
| treatment |  |
| sequence |  |
| Random Effects | treatment |  |
| Repeated Effects | treatment | 280 |
| Total | |  |

|  |
| --- |
| 1. Dependent Variable: lnpk. |

|  |  |
| --- | --- |
| **Information Criteria1** | |
| -2 Restricted Log Likelihood | 660.04654017 |
| Akaike's Information Criterion (AIC) | 670.04654017 |
| Hurvich and Tsai's Criterion (AICC) | 670.27042076 |
| Bozdogan's Criterion (CAIC) | 693.11218070 |
| Schwarz's Bayesian Criterion (BIC) | 688.11218070 |

|  |
| --- |
| The information criteria are displayed in smaller-is-better form.1 |
| 1. Dependent Variable: lnpk. |

Fixed Effects

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| **Type III Tests of Fixed Effects1** | | | | |
| Source | **Numerator df** | **Denominator df** | **F** | **Sig.** |
| Intercept | 1 | 53.392 | 1360.784 | .000 |
| period | 3 | 177.967 | 2.621 | .052 |
| treatment | 1 | 187.168 | 3.719 | .055 |
| sequence | 1 | 53.392 | .394 | .533 |

|  |
| --- |
| 1. Dependent Variable: lnpk. |

Covariance Parameters

|  |  |  |  |
| --- | --- | --- | --- |
| **Estimates of Covariance Parameters1** | | | |
| Parameter | | **Estimate** | **Std. Error** |
| Repeated Measures | Var: [treatment=R] | .484 | .067 |
| Var: [treatment=T] | .190 | .031 |
| treatment [subject = subject] | Var: [treatment=R] | 1.027 | .216 |
| Var: [treatment=T] | .924 | .175 |
| CSH rho | 1.0002 | .000 |

|  |
| --- |
| 1. Dependent Variable: lnpk. |
| 2. This covariance parameter is redundant. |

Estimated Marginal Means

treatment

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| **Estimates1** | | | | | |
| treatment | **Mean** | **Std. Error** | **df** | **90% Confidence Interval** | |
| **Lower Bound** | **Upper Bound** |
| R | 4.604 | .135 | 68.840 | 4.379 | 4.828 |
| T | 4.470 | .121 | 54.164 | 4.268 | 4.672 |

|  |
| --- |
| 1. Dependent Variable: lnpk. |

|  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- |
| **Pairwise Comparisons1** | | | | | | |
| (I) treatment | (J) treatment | **Mean Difference (I-J)** | **Std. Error** | **df** | **Sig.3** | **90% Confidence Interval for Difference3** |
| **Lower Bound** |
| T | R | -.13427529\* | .06962795 | 187.16765579 | .05531000 | -.24937277 |

|  |  |  |
| --- | --- | --- |
| **Pairwise Comparisons1** | | |
| (I) treatment | (J) treatment | 90% Confidence Interval for Difference |
| **Upper Bound** |
| T | R | -.01917781 |

|  |
| --- |
| Based on estimated marginal means1 |
| \*. The mean difference is significant at the .10 level. |
| 1. Dependent Variable: lnpk. |
| 3. Adjustment for multiple comparisons: Least Significant Difference (equivalent to no adjustments). |

|  |  |  |  |
| --- | --- | --- | --- |
| **Univariate Tests1** | | | |
| **Numerator df** | **Denominator df** | **F** | **Sig.** |
| 1 | 187.168 | 3.719 | .055 |

|  |
| --- |
| The F tests the effect of treatment. This test is based on the linearly independent pairwise comparisons among the estimated marginal means.1 |
| 1. Dependent Variable: lnpk. |

DATASET CLOSE pkdataset.

TITLE "RDS26".

RDS26

GET DATA

/TYPE=XLSX

/FILE='.\rds01.xlsx'

/SHEET=name 'rds26'

/CELLRANGE=FULL

/READNAMES=ON

/LEADINGSPACES IGNORE=YES

/TRAILINGSPACES IGNORE=YES

/DATATYPEMIN PERCENTAGE=95.0

/HIDDEN IGNORE=YES.

EXECUTE.

DATASET NAME pkdataset WINDOW=FRONT.

COMPUTE lnpk=ln(PK).

EXECUTE.

UNIANOVA lnpk BY period sequence treatment subject

/RANDOM subject

/CONTRAST(treatment)=Simple(1)

/METHOD=SSTYPE(3)

/INTERCEPT=INCLUDE

/CRITERIA=ALPHA(0.05)

/DESIGN=period sequence treatment subject(sequence).

Univariate Analysis of Variance

|  |  |  |
| --- | --- | --- |
| **Notes** | | |
| Output Created | | 28-FEB-2021 17:55:13 |
| Comments | |  |
| Input | Active Dataset | pkdataset |
| Filter | <none> |
| Weight | <none> |
| Split File | <none> |
| N of Rows in Working Data File | 216 |
| Missing Value Handling | Definition of Missing | User-defined missing values are treated as missing. |
| Cases Used | Statistics are based on all cases with valid data for all variables in the model. |
| Syntax | | UNIANOVA lnpk BY period sequence treatment subject  /RANDOM subject  /CONTRAST(treatment)=Simple(1)  /METHOD=SSTYPE(3)  /INTERCEPT=INCLUDE  /CRITERIA=ALPHA(0.05)  /DESIGN=period sequence treatment subject(sequence). |
| Resources | Processor Time | 00:00:00.02 |
| Elapsed Time | 00:00:00.06 |

|  |  |  |
| --- | --- | --- |
| **Between-Subjects Factors** | | |
|  | | **N** |
| period | 1 | 54 |
| 2 | 54 |
| 3 | 52 |
| 4 | 52 |
| sequence | RTRT | 106 |
| TRTR | 106 |
| treatment | R | 106 |
| T | 106 |
| subject | 1 | 4 |
| 2 | 4 |
| 3 | 2 |
| 4 | 4 |
| 5 | 4 |
| 6 | 4 |
| 7 | 4 |
| 8 | 4 |
| 9 | 4 |
| 10 | 4 |
| 11 | 4 |
| 12 | 4 |
| 13 | 4 |
| 15 | 4 |
| 16 | 4 |
| 17 | 4 |
| 18 | 4 |
| 19 | 4 |
| 20 | 4 |
| 21 | 4 |
| 22 | 4 |
| 23 | 4 |
| 24 | 4 |
| 25 | 4 |
| 26 | 4 |
| 27 | 2 |
| 28 | 4 |
| 29 | 4 |
| 30 | 4 |
| 31 | 4 |
| 32 | 4 |
| 33 | 4 |
| 34 | 4 |
| 35 | 4 |
| 36 | 4 |
| 37 | 4 |
| 38 | 4 |
| 39 | 4 |
| 40 | 4 |
| 42 | 4 |
| 43 | 4 |
| 44 | 4 |
| 45 | 4 |
| 46 | 4 |
| 47 | 4 |
| 48 | 4 |
| 49 | 4 |
| 50 | 4 |
| 52 | 4 |
| 53 | 4 |
| 54 | 4 |
| 55 | 4 |
| 56 | 4 |
| 57 | 4 |

|  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- |
| **Tests of Between-Subjects Effects** | | | | | | |
| Dependent Variable: lnpk | | | | | | |
| Source | | **Type III Sum of Squares** | **df** | **Mean Square** | **F** | **Sig.** |
| Intercept | Hypothesis | 3203.211 | 1 | 3203.211 | 2609.999 | .000 |
| Error | 64.399 | 52.472 | 1.2271 |  |  |
| period | Hypothesis | 1.757 | 3 | .586 | 1.939 | .126 |
| Error | 46.534 | 154 | .3022 |  |  |
| sequence | Hypothesis | .015 | 1 | .015 | .012 | .912 |
| Error | 64.422 | 52.437 | 1.2293 |  |  |
| treatment | Hypothesis | 9.084 | 1 | 9.084 | 30.062 | .000 |
| Error | 46.534 | 154 | .3022 |  |  |
| subject(sequence) | Hypothesis | 64.717 | 52 | 1.245 | 4.119 | .000 |
| Error | 46.534 | 154 | .3022 |  |  |

|  |
| --- |
| 1. .982 MS(subject(sequence)) + .018 MS(Error) |
| 2. MS(Error) |
| 3. .983 MS(subject(sequence)) + .017 MS(Error) |

|  |  |  |  |
| --- | --- | --- | --- |
| **Expected Mean Squares1,2** | | | |
| Source | **Variance Component** | | |
| **Var(subject(sequence))** | **Var(Error)** | **Quadratic Term** |
| Intercept | 3.852 | 1.000 | Intercept, period, sequence, treatment |
| period | .000 | 1.000 | period |
| sequence | 3.857 | 1.000 | sequence |
| treatment | .000 | 1.000 | treatment |
| subject(sequence) | 3.924 | 1.000 |  |
| Error | .000 | 1.000 |  |

|  |
| --- |
| 1. For each source, the expected mean square equals the sum of the coefficients in the cells times the variance components, plus a quadratic term involving effects in the Quadratic Term cell. |
| 2. Expected Mean Squares are based on the Type III Sums of Squares. |

Custom Hypothesis Tests

|  |  |  |  |
| --- | --- | --- | --- |
| **Contrast Results (K Matrix)** | | | |
| treatment Simple Contrast1 | | | **Dependent Variable** |
| **lnpk** |
| Level 2 vs. Level 1 | Contrast Estimate | | .414 |
| Hypothesized Value | | 0 |
| Difference (Estimate - Hypothesized) | | .414 |
| Std. Error | | .076 |
| Sig. | | .000 |
| 95% Confidence Interval for Difference | Lower Bound | .265 |
| Upper Bound | .563 |

|  |
| --- |
| 1. Reference category = 1 |

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| **Test Results** | | | | | |
| Dependent Variable: lnpk | | | | | |
| Source | **Sum of Squares** | **df** | **Mean Square** | **F** | **Sig.** |
| Contrast | 9.084 | 1 | 9.084 | 30.062 | .000 |
| Error | 46.534 | 154 | .302 |  |  |

MIXED lnpk BY period sequence treatment subject

/CRITERIA=DFMETHOD(SATTERTHWAITE) CIN(95) MXITER(100) MXSTEP(10) SCORING(1)

SINGULAR(0.000000000001) HCONVERGE(0, ABSOLUTE) LCONVERGE(0, ABSOLUTE) PCONVERGE(0.000001, ABSOLUTE)

/FIXED=period sequence treatment | SSTYPE(3)

/METHOD=REML

/RANDOM= subject(sequence) | COVTYPE(ID)

/EMMEANS=TABLES(treatment) COMPARE REFCAT(FIRST) ADJ(LSD).

Mixed Model Analysis

|  |  |  |
| --- | --- | --- |
| **Notes** | | |
| Output Created | | 28-FEB-2021 17:55:13 |
| Comments | |  |
| Input | Active Dataset | pkdataset |
| Filter | <none> |
| Weight | <none> |
| Split File | <none> |
| N of Rows in Working Data File | 216 |
| Missing Value Handling | Definition of Missing | User-defined missing values are treated as missing. |
| Cases Used | Statistics are based on all cases with valid data for all variables in the model. |
| Syntax | | MIXED lnpk BY period sequence treatment subject  /CRITERIA=DFMETHOD(SATTERTHWAITE) CIN(95) MXITER(100) MXSTEP(10) SCORING(1)  SINGULAR(0.000000000001) HCONVERGE(0, ABSOLUTE) LCONVERGE(0, ABSOLUTE) PCONVERGE(0.000001, ABSOLUTE)  /FIXED=period sequence treatment | SSTYPE(3)  /METHOD=REML  /RANDOM= subject(sequence) | COVTYPE(ID)  /EMMEANS=TABLES(treatment) COMPARE REFCAT(FIRST) ADJ(LSD). |
| Resources | Processor Time | 00:00:00.08 |
| Elapsed Time | 00:00:00.08 |

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| **Model Dimension1** | | | | |
|  | | **Number of Levels** | **Covariance Structure** | **Number of Parameters** |
| Fixed Effects | Intercept | 1 |  | 1 |
| period | 4 |  | 3 |
| sequence | 2 |  | 1 |
| treatment | 2 |  | 1 |
| Random Effects | subject(sequence) | 54 | Identity | 1 |
| Residual | |  |  | 1 |
| Total | | 63 |  | 8 |

|  |
| --- |
| 1. Dependent Variable: lnpk. |

|  |  |
| --- | --- |
| **Information Criteria1** | |
| -2 Restricted Log Likelihood | 435.44528875 |
| Akaike's Information Criterion (AIC) | 439.44528875 |
| Hurvich and Tsai's Criterion (AICC) | 439.50440205 |
| Bozdogan's Criterion (CAIC) | 448.10104109 |
| Schwarz's Bayesian Criterion (BIC) | 446.10104109 |

|  |
| --- |
| The information criteria are displayed in smaller-is-better form.1 |
| 1. Dependent Variable: lnpk. |

Fixed Effects

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| **Type III Tests of Fixed Effects1** | | | | |
| Source | **Numerator df** | **Denominator df** | **F** | **Sig.** |
| Intercept | 1 | 51.818 | 2615.524 | .000 |
| period | 3 | 154.560 | 1.954 | .123 |
| sequence | 1 | 51.804 | .025 | .875 |
| treatment | 1 | 153.960 | 30.049 | .000 |

|  |
| --- |
| 1. Dependent Variable: lnpk. |

Covariance Parameters

|  |  |  |  |
| --- | --- | --- | --- |
| **Estimates of Covariance Parameters1** | | | |
| Parameter | | **Estimate** | **Std. Error** |
| Residual | | .302299 | .034455 |
| subject(sequence) | Variance | .240553 | .063110 |

|  |
| --- |
| 1. Dependent Variable: lnpk. |

Estimated Marginal Means

treatment

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| **Estimates1** | | | | | |
| treatment | **Mean** | **Std. Error** | **df** | **95% Confidence Interval** | |
| **Lower Bound** | **Upper Bound** |
| R | 3.721 | .086 | 78.389 | 3.550 | 3.891 |
| T | 4.135 | .086 | 78.389 | 3.964 | 4.305 |

|  |
| --- |
| 1. Dependent Variable: lnpk. |

|  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- |
| **Pairwise Comparisons1** | | | | | | |
| (I) treatment | (J) treatment | **Mean Difference (I-J)** | **Std. Error** | **df** | **Sig.3** | **95% Confidence Interval for Difference3** |
| **Lower Bound** |
| T | R | .41399815\* | .07552325 | 153.96023447 | .00000017 | .26480257 |

|  |  |  |
| --- | --- | --- |
| **Pairwise Comparisons1** | | |
| (I) treatment | (J) treatment | 95% Confidence Interval for Difference |
| **Upper Bound** |
| T | R | .56319373 |

|  |
| --- |
| Based on estimated marginal means1 |
| \*. The mean difference is significant at the .05 level. |
| 1. Dependent Variable: lnpk. |
| 3. Adjustment for multiple comparisons: Least Significant Difference (equivalent to no adjustments). |

|  |  |  |  |
| --- | --- | --- | --- |
| **Univariate Tests1** | | | |
| **Numerator df** | **Denominator df** | **F** | **Sig.** |
| 1 | 153.960 | 30.049 | .000 |

|  |
| --- |
| The F tests the effect of treatment. This test is based on the linearly independent pairwise comparisons among the estimated marginal means.1 |
| 1. Dependent Variable: lnpk. |

MIXED lnpk BY period treatment sequence subject

/CRITERIA=CIN(90) MXITER(200) MXSTEP(20) SCORING(2) SINGULAR(0.000000000001) HCONVERGE(0,

RELATIVE) LCONVERGE(0.0000000000001, RELATIVE) PCONVERGE(0, RELATIVE)

/FIXED=period treatment sequence | SSTYPE(3)

/METHOD=REML

/RANDOM=treatment | SUBJECT(subject) COVTYPE(CSH)

/REPEATED=treatment | SUBJECT(subject\*period) COVTYPE(DIAG)

/EMMEANS=TABLES(treatment) COMPARE REFCAT(FIRST) ADJ(LSD).

Mixed Model Analysis

|  |  |  |
| --- | --- | --- |
| **Notes** | | |
| Output Created | | 28-FEB-2021 17:55:13 |
| Comments | |  |
| Input | Active Dataset | pkdataset |
| Filter | <none> |
| Weight | <none> |
| Split File | <none> |
| N of Rows in Working Data File | 216 |
| Missing Value Handling | Definition of Missing | User-defined missing values are treated as missing. |
| Cases Used | Statistics are based on all cases with valid data for all variables in the model. |
| Syntax | | MIXED lnpk BY period treatment sequence subject  /CRITERIA=CIN(90) MXITER(200) MXSTEP(20) SCORING(2) SINGULAR(0.000000000001) HCONVERGE(0,  RELATIVE) LCONVERGE(0.0000000000001, RELATIVE) PCONVERGE(0, RELATIVE)  /FIXED=period treatment sequence | SSTYPE(3)  /METHOD=REML  /RANDOM=treatment | SUBJECT(subject) COVTYPE(CSH)  /REPEATED=treatment | SUBJECT(subject\*period) COVTYPE(DIAG)  /EMMEANS=TABLES(treatment) COMPARE REFCAT(FIRST) ADJ(LSD). |
| Resources | Processor Time | 00:00:00.09 |
| Elapsed Time | 00:00:00.09 |

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| **Model Dimension1** | | | | | |
|  | | **Number of Levels** | **Covariance Structure** | **Number of Parameters** | **Subject Variables** |
| Fixed Effects | Intercept | 1 |  | 1 |  |
| period | 4 |  | 3 |  |
| treatment | 2 |  | 1 |  |
| sequence | 2 |  | 1 |  |
| Random Effects | treatment | 2 | Heterogeneous Compound Symmetry | 3 | subject |
| Repeated Effects | treatment | 2 | Diagonal | 2 | subject \* period |
| Total | | 13 |  | 11 |  |

|  |  |  |
| --- | --- | --- |
| **Model Dimension1** | | |
|  | | **Number of Subjects** |
| Fixed Effects | Intercept |  |
| period |  |
| treatment |  |
| sequence |  |
| Random Effects | treatment |  |
| Repeated Effects | treatment | 212 |
| Total | |  |

|  |
| --- |
| 1. Dependent Variable: lnpk. |

|  |  |
| --- | --- |
| **Information Criteria1** | |
| -2 Restricted Log Likelihood | 433.84147582 |
| Akaike's Information Criterion (AIC) | 443.84147582 |
| Hurvich and Tsai's Criterion (AICC) | 444.14147582 |
| Bozdogan's Criterion (CAIC) | 465.48085666 |
| Schwarz's Bayesian Criterion (BIC) | 460.48085666 |

|  |
| --- |
| The information criteria are displayed in smaller-is-better form.1 |
| 1. Dependent Variable: lnpk. |

Fixed Effects

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| **Type III Tests of Fixed Effects1** | | | | |
| Source | **Numerator df** | **Denominator df** | **F** | **Sig.** |
| Intercept | 1 | 51.819 | 2614.020 | .000 |
| period | 3 | 123.136 | 2.063 | .109 |
| treatment | 1 | 51.401 | 27.148 | .000 |
| sequence | 1 | 51.805 | .026 | .872 |

|  |
| --- |
| 1. Dependent Variable: lnpk. |

Covariance Parameters

|  |  |  |  |
| --- | --- | --- | --- |
| **Estimates of Covariance Parameters1** | | | |
| Parameter | | **Estimate** | **Std. Error** |
| Repeated Measures | Var: [treatment=R] | .306 | .061 |
| Var: [treatment=T] | .269 | .053 |
| treatment [subject = subject] | Var: [treatment=R] | .200 | .076 |
| Var: [treatment=T] | .311 | .092 |
| CSH rho | .936 | .153 |

|  |
| --- |
| 1. Dependent Variable: lnpk. |

Estimated Marginal Means

treatment

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| **Estimates1** | | | | | |
| treatment | **Mean** | **Std. Error** | **df** | **90% Confidence Interval** | |
| **Lower Bound** | **Upper Bound** |
| R | 3.721 | .081 | 51.735 | 3.585 | 3.857 |
| T | 4.133 | .091 | 51.745 | 3.980 | 4.286 |

|  |
| --- |
| 1. Dependent Variable: lnpk. |

|  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- |
| **Pairwise Comparisons1** | | | | | | |
| (I) treatment | (J) treatment | **Mean Difference (I-J)** | **Std. Error** | **df** | **Sig.3** | **90% Confidence Interval for Difference3** |
| **Lower Bound** |
| T | R | .41203905\* | .07908040 | 51.40085759 | .00000337 | .27957596 |

|  |  |  |
| --- | --- | --- |
| **Pairwise Comparisons1** | | |
| (I) treatment | (J) treatment | 90% Confidence Interval for Difference |
| **Upper Bound** |
| T | R | .54450214 |

|  |
| --- |
| Based on estimated marginal means1 |
| \*. The mean difference is significant at the .10 level. |
| 1. Dependent Variable: lnpk. |
| 3. Adjustment for multiple comparisons: Least Significant Difference (equivalent to no adjustments). |

|  |  |  |  |
| --- | --- | --- | --- |
| **Univariate Tests1** | | | |
| **Numerator df** | **Denominator df** | **F** | **Sig.** |
| 1 | 51.401 | 27.148 | .000 |

|  |
| --- |
| The F tests the effect of treatment. This test is based on the linearly independent pairwise comparisons among the estimated marginal means.1 |
| 1. Dependent Variable: lnpk. |

DATASET CLOSE pkdataset.

TITLE "RDS27".

RDS27

GET DATA

/TYPE=XLSX

/FILE='.\rds01.xlsx'

/SHEET=name 'rds27'

/CELLRANGE=FULL

/READNAMES=ON

/LEADINGSPACES IGNORE=YES

/TRAILINGSPACES IGNORE=YES

/DATATYPEMIN PERCENTAGE=95.0

/HIDDEN IGNORE=YES.

EXECUTE.

DATASET NAME pkdataset WINDOW=FRONT.

COMPUTE lnpk=ln(PK).

EXECUTE.

UNIANOVA lnpk BY period sequence treatment subject

/RANDOM subject

/CONTRAST(treatment)=Simple(1)

/METHOD=SSTYPE(3)

/INTERCEPT=INCLUDE

/CRITERIA=ALPHA(0.05)

/DESIGN=period sequence treatment subject(sequence).

Univariate Analysis of Variance

|  |  |  |
| --- | --- | --- |
| **Notes** | | |
| Output Created | | 28-FEB-2021 17:55:14 |
| Comments | |  |
| Input | Active Dataset | pkdataset |
| Filter | <none> |
| Weight | <none> |
| Split File | <none> |
| N of Rows in Working Data File | 624 |
| Missing Value Handling | Definition of Missing | User-defined missing values are treated as missing. |
| Cases Used | Statistics are based on all cases with valid data for all variables in the model. |
| Syntax | | UNIANOVA lnpk BY period sequence treatment subject  /RANDOM subject  /CONTRAST(treatment)=Simple(1)  /METHOD=SSTYPE(3)  /INTERCEPT=INCLUDE  /CRITERIA=ALPHA(0.05)  /DESIGN=period sequence treatment subject(sequence). |
| Resources | Processor Time | 00:00:00.92 |
| Elapsed Time | 00:00:01.33 |

|  |  |  |
| --- | --- | --- |
| **Between-Subjects Factors** | | |
|  | | **N** |
| period | 1 | 312 |
| 2 | 311 |
| sequence | RR | 156 |
| RT | 155 |
| TR | 156 |
| TT | 156 |
| treatment | R | 312 |
| T | 311 |
| subject | 1 | 2 |
| 2 | 2 |
| 3 | 2 |
| 4 | 2 |
| 5 | 2 |
| 6 | 2 |
| 7 | 2 |
| 8 | 2 |
| 9 | 2 |
| 10 | 2 |
| 11 | 2 |
| 12 | 2 |
| 13 | 2 |
| 14 | 2 |
| 15 | 2 |
| 16 | 2 |
| 17 | 2 |
| 18 | 2 |
| 19 | 2 |
| 20 | 2 |
| 21 | 2 |
| 22 | 2 |
| 23 | 2 |
| 24 | 2 |
| 25 | 2 |
| 26 | 2 |
| 27 | 2 |
| 28 | 2 |
| 29 | 2 |
| 30 | 2 |
| 31 | 2 |
| 32 | 2 |
| 33 | 2 |
| 34 | 2 |
| 35 | 2 |
| 36 | 2 |
| 37 | 2 |
| 38 | 2 |
| 39 | 2 |
| 40 | 2 |
| 41 | 2 |
| 42 | 2 |
| 43 | 2 |
| 44 | 2 |
| 45 | 2 |
| 46 | 2 |
| 47 | 2 |
| 48 | 2 |
| 49 | 2 |
| 50 | 2 |
| 51 | 2 |
| 52 | 2 |
| 53 | 2 |
| 54 | 2 |
| 55 | 2 |
| 56 | 2 |
| 57 | 2 |
| 58 | 2 |
| 59 | 2 |
| 60 | 2 |
| 61 | 2 |
| 62 | 2 |
| 63 | 2 |
| 64 | 2 |
| 65 | 2 |
| 66 | 2 |
| 67 | 2 |
| 68 | 2 |
| 69 | 2 |
| 70 | 2 |
| 71 | 2 |
| 72 | 2 |
| 73 | 2 |
| 74 | 2 |
| 75 | 2 |
| 76 | 2 |
| 77 | 2 |
| 78 | 2 |
| 79 | 2 |
| 80 | 2 |
| 81 | 2 |
| 82 | 2 |
| 83 | 2 |
| 84 | 2 |
| 85 | 2 |
| 86 | 2 |
| 87 | 2 |
| 88 | 2 |
| 89 | 2 |
| 90 | 2 |
| 91 | 2 |
| 92 | 2 |
| 93 | 2 |
| 94 | 2 |
| 95 | 2 |
| 96 | 2 |
| 97 | 2 |
| 98 | 2 |
| 99 | 2 |
| 100 | 2 |
| 101 | 2 |
| 102 | 2 |
| 103 | 2 |
| 104 | 2 |
| 105 | 2 |
| 106 | 2 |
| 107 | 2 |
| 108 | 2 |
| 109 | 2 |
| 110 | 2 |
| 111 | 1 |
| 112 | 2 |
| 113 | 2 |
| 114 | 2 |
| 115 | 2 |
| 116 | 2 |
| 117 | 2 |
| 118 | 2 |
| 119 | 2 |
| 120 | 2 |
| 121 | 2 |
| 122 | 2 |
| 123 | 2 |
| 124 | 2 |
| 125 | 2 |
| 126 | 2 |
| 127 | 2 |
| 128 | 2 |
| 129 | 2 |
| 130 | 2 |
| 131 | 2 |
| 132 | 2 |
| 133 | 2 |
| 134 | 2 |
| 135 | 2 |
| 136 | 2 |
| 137 | 2 |
| 138 | 2 |
| 139 | 2 |
| 140 | 2 |
| 141 | 2 |
| 142 | 2 |
| 143 | 2 |
| 144 | 2 |
| 145 | 2 |
| 146 | 2 |
| 147 | 2 |
| 148 | 2 |
| 149 | 2 |
| 150 | 2 |
| 151 | 2 |
| 152 | 2 |
| 153 | 2 |
| 154 | 2 |
| 155 | 2 |
| 156 | 2 |
| 157 | 2 |
| 158 | 2 |
| 159 | 2 |
| 160 | 2 |
| 161 | 2 |
| 162 | 2 |
| 163 | 2 |
| 164 | 2 |
| 165 | 2 |
| 166 | 2 |
| 167 | 2 |
| 168 | 2 |
| 169 | 2 |
| 170 | 2 |
| 171 | 2 |
| 172 | 2 |
| 173 | 2 |
| 174 | 2 |
| 175 | 2 |
| 176 | 2 |
| 177 | 2 |
| 178 | 2 |
| 179 | 2 |
| 180 | 2 |
| 181 | 2 |
| 182 | 2 |
| 183 | 2 |
| 184 | 2 |
| 185 | 2 |
| 186 | 2 |
| 187 | 2 |
| 188 | 2 |
| 189 | 2 |
| 190 | 2 |
| 191 | 2 |
| 192 | 2 |
| 193 | 2 |
| 194 | 2 |
| 195 | 2 |
| 196 | 2 |
| 197 | 2 |
| 198 | 2 |
| 199 | 2 |
| 200 | 2 |
| 201 | 2 |
| 202 | 2 |
| 203 | 2 |
| 204 | 2 |
| 205 | 2 |
| 206 | 2 |
| 207 | 2 |
| 208 | 2 |
| 209 | 2 |
| 210 | 2 |
| 211 | 2 |
| 212 | 2 |
| 213 | 2 |
| 214 | 2 |
| 215 | 2 |
| 216 | 2 |
| 217 | 2 |
| 218 | 2 |
| 219 | 2 |
| 220 | 2 |
| 221 | 2 |
| 222 | 2 |
| 223 | 2 |
| 224 | 2 |
| 225 | 2 |
| 226 | 2 |
| 227 | 2 |
| 228 | 2 |
| 229 | 2 |
| 230 | 2 |
| 231 | 2 |
| 232 | 2 |
| 233 | 2 |
| 234 | 2 |
| 235 | 2 |
| 236 | 2 |
| 237 | 2 |
| 238 | 2 |
| 239 | 2 |
| 240 | 2 |
| 241 | 2 |
| 242 | 2 |
| 243 | 2 |
| 244 | 2 |
| 245 | 2 |
| 246 | 2 |
| 247 | 2 |
| 248 | 2 |
| 249 | 2 |
| 250 | 2 |
| 251 | 2 |
| 252 | 2 |
| 253 | 2 |
| 254 | 2 |
| 255 | 2 |
| 256 | 2 |
| 257 | 2 |
| 258 | 2 |
| 259 | 2 |
| 260 | 2 |
| 261 | 2 |
| 262 | 2 |
| 263 | 2 |
| 264 | 2 |
| 265 | 2 |
| 266 | 2 |
| 267 | 2 |
| 268 | 2 |
| 269 | 2 |
| 270 | 2 |
| 271 | 2 |
| 272 | 2 |
| 273 | 2 |
| 274 | 2 |
| 275 | 2 |
| 276 | 2 |
| 277 | 2 |
| 278 | 2 |
| 279 | 2 |
| 280 | 2 |
| 281 | 2 |
| 282 | 2 |
| 283 | 2 |
| 284 | 2 |
| 285 | 2 |
| 286 | 2 |
| 287 | 2 |
| 288 | 2 |
| 289 | 2 |
| 290 | 2 |
| 291 | 2 |
| 292 | 2 |
| 293 | 2 |
| 294 | 2 |
| 295 | 2 |
| 296 | 2 |
| 297 | 2 |
| 298 | 2 |
| 299 | 2 |
| 300 | 2 |
| 301 | 2 |
| 302 | 2 |
| 303 | 2 |
| 304 | 2 |
| 305 | 2 |
| 306 | 2 |
| 307 | 2 |
| 308 | 2 |
| 309 | 2 |
| 310 | 2 |
| 311 | 2 |
| 312 | 2 |

|  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- |
| **Tests of Between-Subjects Effects** | | | | | | |
| Dependent Variable: lnpk | | | | | | |
| Source | | **Type III Sum of Squares** | **df** | **Mean Square** | **F** | **Sig.** |
| Intercept | Hypothesis | 12841.330 | 1 | 12841.330 | 11923.817 | .000 |
| Error | 331.809 | 308.101 | 1.0771 |  |  |
| period | Hypothesis | .023 | 1 | .023 | .205 | .651 |
| Error | 33.983 | 309 | .1102 |  |  |
| sequence | Hypothesis | 2.187 | 3 | .729 | .797 | .496 |
| Error | 293.437 | 320.774 | .9153 |  |  |
| treatment | Hypothesis | 2.456 | 1 | 2.456 | 22.335 | .000 |
| Error | 33.983 | 309 | .1102 |  |  |
| subject(sequence) | Hypothesis | 332.180 | 308 | 1.079 | 9.806 | .000 |
| Error | 33.983 | 309 | .1102 |  |  |

|  |
| --- |
| 1. .998 MS(subject(sequence)) + .002 MS(Error) |
| 2. MS(Error) |
| 3. .831 MS(subject(sequence)) + .169 MS(Error) |

|  |  |  |  |
| --- | --- | --- | --- |
| **Expected Mean Squares1,2** | | | |
| Source | **Variance Component** | | |
| **Var(subject(sequence))** | **Var(Error)** | **Quadratic Term** |
| Intercept | 1.994 | 1.000 | Intercept, period, sequence, treatment |
| period | .000 | 1.000 | period |
| sequence | 1.659 | 1.000 | sequence |
| treatment | .000 | 1.000 | treatment |
| subject(sequence) | 1.997 | 1.000 |  |
| Error | .000 | 1.000 |  |

|  |
| --- |
| 1. For each source, the expected mean square equals the sum of the coefficients in the cells times the variance components, plus a quadratic term involving effects in the Quadratic Term cell. |
| 2. Expected Mean Squares are based on the Type III Sums of Squares. |

Custom Hypothesis Tests

|  |  |  |  |
| --- | --- | --- | --- |
| **Contrast Results (K Matrix)** | | | |
| treatment Simple Contrast1 | | | **Dependent Variable** |
| **lnpk** |
| Level 2 vs. Level 1 | Contrast Estimate | | -.178 |
| Hypothesized Value | | 0 |
| Difference (Estimate - Hypothesized) | | -.178 |
| Std. Error | | .038 |
| Sig. | | .000 |
| 95% Confidence Interval for Difference | Lower Bound | -.252 |
| Upper Bound | -.104 |

|  |
| --- |
| 1. Reference category = 1 |

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| **Test Results** | | | | | |
| Dependent Variable: lnpk | | | | | |
| Source | **Sum of Squares** | **df** | **Mean Square** | **F** | **Sig.** |
| Contrast | 2.456 | 1 | 2.456 | 22.335 | .000 |
| Error | 33.983 | 309 | .110 |  |  |

MIXED lnpk BY period sequence treatment subject

/CRITERIA=DFMETHOD(SATTERTHWAITE) CIN(95) MXITER(100) MXSTEP(10) SCORING(1)

SINGULAR(0.000000000001) HCONVERGE(0, ABSOLUTE) LCONVERGE(0, ABSOLUTE) PCONVERGE(0.000001, ABSOLUTE)

/FIXED=period sequence treatment | SSTYPE(3)

/METHOD=REML

/RANDOM= subject(sequence) | COVTYPE(ID)

/EMMEANS=TABLES(treatment) COMPARE REFCAT(FIRST) ADJ(LSD).

Mixed Model Analysis

|  |  |  |
| --- | --- | --- |
| **Notes** | | |
| Output Created | | 28-FEB-2021 17:55:16 |
| Comments | |  |
| Input | Active Dataset | pkdataset |
| Filter | <none> |
| Weight | <none> |
| Split File | <none> |
| N of Rows in Working Data File | 624 |
| Missing Value Handling | Definition of Missing | User-defined missing values are treated as missing. |
| Cases Used | Statistics are based on all cases with valid data for all variables in the model. |
| Syntax | | MIXED lnpk BY period sequence treatment subject  /CRITERIA=DFMETHOD(SATTERTHWAITE) CIN(95) MXITER(100) MXSTEP(10) SCORING(1)  SINGULAR(0.000000000001) HCONVERGE(0, ABSOLUTE) LCONVERGE(0, ABSOLUTE) PCONVERGE(0.000001, ABSOLUTE)  /FIXED=period sequence treatment | SSTYPE(3)  /METHOD=REML  /RANDOM= subject(sequence) | COVTYPE(ID)  /EMMEANS=TABLES(treatment) COMPARE REFCAT(FIRST) ADJ(LSD). |
| Resources | Processor Time | 00:00:05.34 |
| Elapsed Time | 00:00:05.60 |

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| **Model Dimension1** | | | | |
|  | | **Number of Levels** | **Covariance Structure** | **Number of Parameters** |
| Fixed Effects | Intercept | 1 |  | 1 |
| period | 2 |  | 1 |
| sequence | 4 |  | 3 |
| treatment | 2 |  | 1 |
| Random Effects | subject(sequence) | 312 | Identity | 1 |
| Residual | |  |  | 1 |
| Total | | 321 |  | 8 |

|  |
| --- |
| 1. Dependent Variable: lnpk. |

|  |  |
| --- | --- |
| **Information Criteria1** | |
| -2 Restricted Log Likelihood | 1125.09238307 |
| Akaike's Information Criterion (AIC) | 1129.09238307 |
| Hurvich and Tsai's Criterion (AICC) | 1129.11192705 |
| Bozdogan's Criterion (CAIC) | 1139.94212112 |
| Schwarz's Bayesian Criterion (BIC) | 1137.94212112 |

|  |
| --- |
| The information criteria are displayed in smaller-is-better form.1 |
| 1. Dependent Variable: lnpk. |

Fixed Effects

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| **Type III Tests of Fixed Effects1** | | | | |
| Source | **Numerator df** | **Denominator df** | **F** | **Sig.** |
| Intercept | 1 | 306.693 | 11820.127 | .000 |
| period | 1 | 307.876 | .161 | .688 |
| sequence | 3 | 325.742 | .789 | .501 |
| treatment | 1 | 308.041 | 21.623 | .000 |

|  |
| --- |
| 1. Dependent Variable: lnpk. |

Covariance Parameters

|  |  |  |  |
| --- | --- | --- | --- |
| **Estimates of Covariance Parameters1** | | | |
| Parameter | | **Estimate** | **Std. Error** |
| Residual | | .110233 | .008887 |
| subject(sequence) | Variance | .489840 | .044263 |

|  |
| --- |
| 1. Dependent Variable: lnpk. |

Estimated Marginal Means

treatment

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| **Estimates1** | | | | | |
| treatment | **Mean** | **Std. Error** | **df** | **95% Confidence Interval** | |
| **Lower Bound** | **Upper Bound** |
| R | 4.632 | .046 | 426.610 | 4.542 | 4.722 |
| T | 4.457 | .046 | 427.767 | 4.367 | 4.547 |

|  |
| --- |
| 1. Dependent Variable: lnpk. |

|  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- |
| **Pairwise Comparisons1** | | | | | | |
| (I) treatment | (J) treatment | **Mean Difference (I-J)** | **Std. Error** | **df** | **Sig.3** | **95% Confidence Interval for Difference3** |
| **Lower Bound** |
| T | R | -.17532387\* | .03770344 | 308.04098058 | .00000493 | -.24951274 |

|  |  |  |
| --- | --- | --- |
| **Pairwise Comparisons1** | | |
| (I) treatment | (J) treatment | 95% Confidence Interval for Difference |
| **Upper Bound** |
| T | R | -.10113499 |

|  |
| --- |
| Based on estimated marginal means1 |
| \*. The mean difference is significant at the .05 level. |
| 1. Dependent Variable: lnpk. |
| 3. Adjustment for multiple comparisons: Least Significant Difference (equivalent to no adjustments). |

|  |  |  |  |
| --- | --- | --- | --- |
| **Univariate Tests1** | | | |
| **Numerator df** | **Denominator df** | **F** | **Sig.** |
| 1 | 308.041 | 21.623 | .000 |

|  |
| --- |
| The F tests the effect of treatment. This test is based on the linearly independent pairwise comparisons among the estimated marginal means.1 |
| 1. Dependent Variable: lnpk. |

MIXED lnpk BY period treatment sequence subject

/CRITERIA=CIN(90) MXITER(200) MXSTEP(20) SCORING(2) SINGULAR(0.000000000001) HCONVERGE(0,

RELATIVE) LCONVERGE(0.0000000000001, RELATIVE) PCONVERGE(0, RELATIVE)

/FIXED=period treatment sequence | SSTYPE(3)

/METHOD=REML

/RANDOM=treatment | SUBJECT(subject) COVTYPE(CSH)

/REPEATED=treatment | SUBJECT(subject\*period) COVTYPE(DIAG)

/EMMEANS=TABLES(treatment) COMPARE REFCAT(FIRST) ADJ(LSD).

Mixed Model Analysis

|  |  |  |
| --- | --- | --- |
| **Notes** | | |
| Output Created | | 28-FEB-2021 17:55:21 |
| Comments | |  |
| Input | Active Dataset | pkdataset |
| Filter | <none> |
| Weight | <none> |
| Split File | <none> |
| N of Rows in Working Data File | 624 |
| Missing Value Handling | Definition of Missing | User-defined missing values are treated as missing. |
| Cases Used | Statistics are based on all cases with valid data for all variables in the model. |
| Syntax | | MIXED lnpk BY period treatment sequence subject  /CRITERIA=CIN(90) MXITER(200) MXSTEP(20) SCORING(2) SINGULAR(0.000000000001) HCONVERGE(0,  RELATIVE) LCONVERGE(0.0000000000001, RELATIVE) PCONVERGE(0, RELATIVE)  /FIXED=period treatment sequence | SSTYPE(3)  /METHOD=REML  /RANDOM=treatment | SUBJECT(subject) COVTYPE(CSH)  /REPEATED=treatment | SUBJECT(subject\*period) COVTYPE(DIAG)  /EMMEANS=TABLES(treatment) COMPARE REFCAT(FIRST) ADJ(LSD). |
| Resources | Processor Time | 00:00:00.20 |
| Elapsed Time | 00:00:00.25 |

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| **Model Dimension1** | | | | | |
|  | | **Number of Levels** | **Covariance Structure** | **Number of Parameters** | **Subject Variables** |
| Fixed Effects | Intercept | 1 |  | 1 |  |
| period | 2 |  | 1 |  |
| treatment | 2 |  | 1 |  |
| sequence | 4 |  | 3 |  |
| Random Effects | treatment | 2 | Heterogeneous Compound Symmetry | 3 | subject |
| Repeated Effects | treatment | 2 | Diagonal | 2 | subject \* period |
| Total | | 13 |  | 11 |  |

|  |  |  |
| --- | --- | --- |
| **Model Dimension1** | | |
|  | | **Number of Subjects** |
| Fixed Effects | Intercept |  |
| period |  |
| treatment |  |
| sequence |  |
| Random Effects | treatment |  |
| Repeated Effects | treatment | 623 |
| Total | |  |

|  |
| --- |
| 1. Dependent Variable: lnpk. |

|  |  |
| --- | --- |
| **Information Criteria1** | |
| -2 Restricted Log Likelihood | 1123.66435096 |
| Akaike's Information Criterion (AIC) | 1133.66435096 |
| Hurvich and Tsai's Criterion (AICC) | 1133.76255064 |
| Bozdogan's Criterion (CAIC) | 1160.78869608 |
| Schwarz's Bayesian Criterion (BIC) | 1155.78869608 |

|  |
| --- |
| The information criteria are displayed in smaller-is-better form.1 |
| 1. Dependent Variable: lnpk. |

Fixed Effects

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| **Type III Tests of Fixed Effects1** | | | | |
| Source | **Numerator df** | **Denominator df** | **F** | **Sig.** |
| Intercept | 1 | 304.719 | 11825.462 | .000 |
| period | 1 | 299.733 | .231 | .631 |
| treatment | 1 | 151.756 | 20.520 | .000 |
| sequence | 3 | 266.000 | .803 | .493 |

|  |
| --- |
| 1. Dependent Variable: lnpk. |

Covariance Parameters

|  |  |  |  |
| --- | --- | --- | --- |
| **Estimates of Covariance Parameters1** | | | |
| Parameter | | **Estimate** | **Std. Error** |
| Repeated Measures | Var: [treatment=R] | .117 | .018 |
| Var: [treatment=T] | .093 | .015 |
| treatment [subject = subject] | Var: [treatment=R] | .496 | .052 |
| Var: [treatment=T] | .494 | .054 |
| CSH rho | .978 | .036 |

|  |
| --- |
| 1. Dependent Variable: lnpk. |

Estimated Marginal Means

treatment

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| **Estimates1** | | | | | |
| treatment | **Mean** | **Std. Error** | **df** | **90% Confidence Interval** | |
| **Lower Bound** | **Upper Bound** |
| R | 4.632 | .046 | 325.554 | 4.555 | 4.709 |
| T | 4.457 | .046 | 299.147 | 4.382 | 4.532 |

|  |
| --- |
| 1. Dependent Variable: lnpk. |

|  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- |
| **Pairwise Comparisons1** | | | | | | |
| (I) treatment | (J) treatment | **Mean Difference (I-J)** | **Std. Error** | **df** | **Sig.3** | **90% Confidence Interval for Difference3** |
| **Lower Bound** |
| T | R | -.17495514\* | .03862199 | 151.75622147 | .00001187 | -.23887285 |

|  |  |  |
| --- | --- | --- |
| **Pairwise Comparisons1** | | |
| (I) treatment | (J) treatment | 90% Confidence Interval for Difference |
| **Upper Bound** |
| T | R | -.11103742 |

|  |
| --- |
| Based on estimated marginal means1 |
| \*. The mean difference is significant at the .10 level. |
| 1. Dependent Variable: lnpk. |
| 3. Adjustment for multiple comparisons: Least Significant Difference (equivalent to no adjustments). |

|  |  |  |  |
| --- | --- | --- | --- |
| **Univariate Tests1** | | | |
| **Numerator df** | **Denominator df** | **F** | **Sig.** |
| 1 | 151.756 | 20.520 | .000 |

|  |
| --- |
| The F tests the effect of treatment. This test is based on the linearly independent pairwise comparisons among the estimated marginal means.1 |
| 1. Dependent Variable: lnpk. |

DATASET CLOSE pkdataset.

TITLE "RDS28".

RDS28

GET DATA

/TYPE=XLSX

/FILE='.\rds01.xlsx'

/SHEET=name 'rds28'

/CELLRANGE=FULL

/READNAMES=ON

/LEADINGSPACES IGNORE=YES

/TRAILINGSPACES IGNORE=YES

/DATATYPEMIN PERCENTAGE=95.0

/HIDDEN IGNORE=YES.

EXECUTE.

DATASET NAME pkdataset WINDOW=FRONT.

COMPUTE lnpk=ln(PK).

EXECUTE.

UNIANOVA lnpk BY period sequence treatment subject

/RANDOM subject

/CONTRAST(treatment)=Simple(1)

/METHOD=SSTYPE(3)

/INTERCEPT=INCLUDE

/CRITERIA=ALPHA(0.05)

/DESIGN=period sequence treatment subject(sequence).

Univariate Analysis of Variance

|  |  |  |
| --- | --- | --- |
| **Notes** | | |
| Output Created | | 28-FEB-2021 17:55:22 |
| Comments | |  |
| Input | Active Dataset | pkdataset |
| Filter | <none> |
| Weight | <none> |
| Split File | <none> |
| N of Rows in Working Data File | 256 |
| Missing Value Handling | Definition of Missing | User-defined missing values are treated as missing. |
| Cases Used | Statistics are based on all cases with valid data for all variables in the model. |
| Syntax | | UNIANOVA lnpk BY period sequence treatment subject  /RANDOM subject  /CONTRAST(treatment)=Simple(1)  /METHOD=SSTYPE(3)  /INTERCEPT=INCLUDE  /CRITERIA=ALPHA(0.05)  /DESIGN=period sequence treatment subject(sequence). |
| Resources | Processor Time | 00:00:00.02 |
| Elapsed Time | 00:00:00.03 |

|  |  |  |
| --- | --- | --- |
| **Between-Subjects Factors** | | |
|  | | **N** |
| period | 1 | 64 |
| 2 | 64 |
| 3 | 64 |
| 4 | 64 |
| sequence | RRTT | 128 |
| TTRR | 128 |
| treatment | R | 128 |
| T | 128 |
| subject | 1 | 4 |
| 2 | 4 |
| 3 | 4 |
| 4 | 4 |
| 5 | 4 |
| 6 | 4 |
| 7 | 4 |
| 8 | 4 |
| 9 | 4 |
| 10 | 4 |
| 11 | 4 |
| 12 | 4 |
| 13 | 4 |
| 14 | 4 |
| 15 | 4 |
| 16 | 4 |
| 17 | 4 |
| 18 | 4 |
| 19 | 4 |
| 20 | 4 |
| 21 | 4 |
| 22 | 4 |
| 23 | 4 |
| 24 | 4 |
| 25 | 4 |
| 26 | 4 |
| 27 | 4 |
| 28 | 4 |
| 29 | 4 |
| 30 | 4 |
| 31 | 4 |
| 32 | 4 |
| 33 | 4 |
| 34 | 4 |
| 35 | 4 |
| 36 | 4 |
| 37 | 4 |
| 38 | 4 |
| 39 | 4 |
| 40 | 4 |
| 41 | 4 |
| 42 | 4 |
| 43 | 4 |
| 44 | 4 |
| 45 | 4 |
| 46 | 4 |
| 47 | 4 |
| 48 | 4 |
| 49 | 4 |
| 50 | 4 |
| 51 | 4 |
| 52 | 4 |
| 53 | 4 |
| 54 | 4 |
| 55 | 4 |
| 56 | 4 |
| 57 | 4 |
| 58 | 4 |
| 59 | 4 |
| 60 | 4 |
| 61 | 4 |
| 62 | 4 |
| 63 | 4 |
| 64 | 4 |

|  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- |
| **Tests of Between-Subjects Effects** | | | | | | |
| Dependent Variable: lnpk | | | | | | |
| Source | | **Type III Sum of Squares** | **df** | **Mean Square** | **F** | **Sig.** |
| Intercept | Hypothesis | 5531.610 | 1 | 5531.610 | 3302.493 | .000 |
| Error | 103.849 | 62 | 1.6751 |  |  |
| period | Hypothesis | .078 | 3 | .026 | .262 | .853 |
| Error | 18.630 | 188 | .0992 |  |  |
| sequence | Hypothesis | 8.322 | 1 | 8.322 | 4.968 | .029 |
| Error | 103.849 | 62 | 1.6751 |  |  |
| treatment | Hypothesis | .265 | 1 | .265 | 2.674 | .104 |
| Error | 18.630 | 188 | .0992 |  |  |
| subject(sequence) | Hypothesis | 103.849 | 62 | 1.675 | 16.903 | .000 |
| Error | 18.630 | 188 | .0992 |  |  |

|  |
| --- |
| 1. MS(subject(sequence)) |
| 2. MS(Error) |

|  |  |  |  |
| --- | --- | --- | --- |
| **Expected Mean Squares1,2** | | | |
| Source | **Variance Component** | | |
| **Var(subject(sequence))** | **Var(Error)** | **Quadratic Term** |
| Intercept | 4.000 | 1.000 | Intercept, period, sequence, treatment |
| period | .000 | 1.000 | period |
| sequence | 4.000 | 1.000 | sequence |
| treatment | .000 | 1.000 | treatment |
| subject(sequence) | 4.000 | 1.000 |  |
| Error | .000 | 1.000 |  |

|  |
| --- |
| 1. For each source, the expected mean square equals the sum of the coefficients in the cells times the variance components, plus a quadratic term involving effects in the Quadratic Term cell. |
| 2. Expected Mean Squares are based on the Type III Sums of Squares. |

Custom Hypothesis Tests

|  |  |  |  |
| --- | --- | --- | --- |
| **Contrast Results (K Matrix)** | | | |
| treatment Simple Contrast1 | | | **Dependent Variable** |
| **lnpk** |
| Level 2 vs. Level 1 | Contrast Estimate | | -.064 |
| Hypothesized Value | | 0 |
| Difference (Estimate - Hypothesized) | | -.064 |
| Std. Error | | .039 |
| Sig. | | .104 |
| 95% Confidence Interval for Difference | Lower Bound | -.142 |
| Upper Bound | .013 |

|  |
| --- |
| 1. Reference category = 1 |

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| **Test Results** | | | | | |
| Dependent Variable: lnpk | | | | | |
| Source | **Sum of Squares** | **df** | **Mean Square** | **F** | **Sig.** |
| Contrast | .265 | 1 | .265 | 2.674 | .104 |
| Error | 18.630 | 188 | .099 |  |  |

MIXED lnpk BY period sequence treatment subject

/CRITERIA=DFMETHOD(SATTERTHWAITE) CIN(95) MXITER(100) MXSTEP(10) SCORING(1)

SINGULAR(0.000000000001) HCONVERGE(0, ABSOLUTE) LCONVERGE(0, ABSOLUTE) PCONVERGE(0.000001, ABSOLUTE)

/FIXED=period sequence treatment | SSTYPE(3)

/METHOD=REML

/RANDOM= subject(sequence) | COVTYPE(ID)

/EMMEANS=TABLES(treatment) COMPARE REFCAT(FIRST) ADJ(LSD).

Mixed Model Analysis

|  |  |  |
| --- | --- | --- |
| **Notes** | | |
| Output Created | | 28-FEB-2021 17:55:22 |
| Comments | |  |
| Input | Active Dataset | pkdataset |
| Filter | <none> |
| Weight | <none> |
| Split File | <none> |
| N of Rows in Working Data File | 256 |
| Missing Value Handling | Definition of Missing | User-defined missing values are treated as missing. |
| Cases Used | Statistics are based on all cases with valid data for all variables in the model. |
| Syntax | | MIXED lnpk BY period sequence treatment subject  /CRITERIA=DFMETHOD(SATTERTHWAITE) CIN(95) MXITER(100) MXSTEP(10) SCORING(1)  SINGULAR(0.000000000001) HCONVERGE(0, ABSOLUTE) LCONVERGE(0, ABSOLUTE) PCONVERGE(0.000001, ABSOLUTE)  /FIXED=period sequence treatment | SSTYPE(3)  /METHOD=REML  /RANDOM= subject(sequence) | COVTYPE(ID)  /EMMEANS=TABLES(treatment) COMPARE REFCAT(FIRST) ADJ(LSD). |
| Resources | Processor Time | 00:00:00.08 |
| Elapsed Time | 00:00:00.09 |

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| **Model Dimension1** | | | | |
|  | | **Number of Levels** | **Covariance Structure** | **Number of Parameters** |
| Fixed Effects | Intercept | 1 |  | 1 |
| period | 4 |  | 3 |
| sequence | 2 |  | 1 |
| treatment | 2 |  | 1 |
| Random Effects | subject(sequence) | 64 | Identity | 1 |
| Residual | |  |  | 1 |
| Total | | 73 |  | 8 |

|  |
| --- |
| 1. Dependent Variable: lnpk. |

|  |  |
| --- | --- |
| **Information Criteria1** | |
| -2 Restricted Log Likelihood | 331.80845105 |
| Akaike's Information Criterion (AIC) | 335.80845105 |
| Hurvich and Tsai's Criterion (AICC) | 335.85703404 |
| Bozdogan's Criterion (CAIC) | 344.85137288 |
| Schwarz's Bayesian Criterion (BIC) | 342.85137288 |

|  |
| --- |
| The information criteria are displayed in smaller-is-better form.1 |
| 1. Dependent Variable: lnpk. |

Fixed Effects

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| **Type III Tests of Fixed Effects1** | | | | |
| Source | **Numerator df** | **Denominator df** | **F** | **Sig.** |
| Intercept | 1 | 62 | 3302.493 | .000 |
| period | 3 | 188 | .262 | .853 |
| sequence | 1 | 62 | 4.968 | .029 |
| treatment | 1 | 188 | 2.674 | .104 |

|  |
| --- |
| 1. Dependent Variable: lnpk. |

Covariance Parameters

|  |  |  |  |
| --- | --- | --- | --- |
| **Estimates of Covariance Parameters1** | | | |
| Parameter | | **Estimate** | **Std. Error** |
| Residual | | .099096 | .010221 |
| subject(sequence) | Variance | .393971 | .075252 |

|  |
| --- |
| 1. Dependent Variable: lnpk. |

Estimated Marginal Means

treatment

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| **Estimates1** | | | | | |
| treatment | **Mean** | **Std. Error** | **df** | **95% Confidence Interval** | |
| **Lower Bound** | **Upper Bound** |
| R | 4.681 | .083 | 69.473 | 4.515 | 4.847 |
| T | 4.616 | .083 | 69.473 | 4.450 | 4.782 |

|  |
| --- |
| 1. Dependent Variable: lnpk. |

|  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- |
| **Pairwise Comparisons1** | | | | | | |
| (I) treatment | (J) treatment | **Mean Difference (I-J)** | **Std. Error** | **df** | **Sig.2** | **95% Confidence Interval for Difference2** |
| **Lower Bound** |
| T | R | -.06434039 | .03934934 | 188.00000000 | .10369980 | -.14196337 |

|  |  |  |
| --- | --- | --- |
| **Pairwise Comparisons1** | | |
| (I) treatment | (J) treatment | 95% Confidence Interval for Difference |
| **Upper Bound** |
| T | R | .01328259 |

|  |
| --- |
| Based on estimated marginal means1 |
| 1. Dependent Variable: lnpk. |
| 2. Adjustment for multiple comparisons: Least Significant Difference (equivalent to no adjustments). |

|  |  |  |  |
| --- | --- | --- | --- |
| **Univariate Tests1** | | | |
| **Numerator df** | **Denominator df** | **F** | **Sig.** |
| 1 | 188 | 2.674 | .104 |

|  |
| --- |
| The F tests the effect of treatment. This test is based on the linearly independent pairwise comparisons among the estimated marginal means.1 |
| 1. Dependent Variable: lnpk. |

MIXED lnpk BY period treatment sequence subject

/CRITERIA=CIN(90) MXITER(200) MXSTEP(20) SCORING(2) SINGULAR(0.000000000001) HCONVERGE(0,

RELATIVE) LCONVERGE(0.0000000000001, RELATIVE) PCONVERGE(0, RELATIVE)

/FIXED=period treatment sequence | SSTYPE(3)

/METHOD=REML

/RANDOM=treatment | SUBJECT(subject) COVTYPE(CSH)

/REPEATED=treatment | SUBJECT(subject\*period) COVTYPE(DIAG)

/EMMEANS=TABLES(treatment) COMPARE REFCAT(FIRST) ADJ(LSD).

Mixed Model Analysis

|  |  |  |
| --- | --- | --- |
| **Notes** | | |
| Output Created | | 28-FEB-2021 17:55:22 |
| Comments | |  |
| Input | Active Dataset | pkdataset |
| Filter | <none> |
| Weight | <none> |
| Split File | <none> |
| N of Rows in Working Data File | 256 |
| Missing Value Handling | Definition of Missing | User-defined missing values are treated as missing. |
| Cases Used | Statistics are based on all cases with valid data for all variables in the model. |
| Syntax | | MIXED lnpk BY period treatment sequence subject  /CRITERIA=CIN(90) MXITER(200) MXSTEP(20) SCORING(2) SINGULAR(0.000000000001) HCONVERGE(0,  RELATIVE) LCONVERGE(0.0000000000001, RELATIVE) PCONVERGE(0, RELATIVE)  /FIXED=period treatment sequence | SSTYPE(3)  /METHOD=REML  /RANDOM=treatment | SUBJECT(subject) COVTYPE(CSH)  /REPEATED=treatment | SUBJECT(subject\*period) COVTYPE(DIAG)  /EMMEANS=TABLES(treatment) COMPARE REFCAT(FIRST) ADJ(LSD). |
| Resources | Processor Time | 00:00:00.09 |
| Elapsed Time | 00:00:00.27 |

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| **Model Dimension1** | | | | | |
|  | | **Number of Levels** | **Covariance Structure** | **Number of Parameters** | **Subject Variables** |
| Fixed Effects | Intercept | 1 |  | 1 |  |
| period | 4 |  | 3 |  |
| treatment | 2 |  | 1 |  |
| sequence | 2 |  | 1 |  |
| Random Effects | treatment | 2 | Heterogeneous Compound Symmetry | 3 | subject |
| Repeated Effects | treatment | 2 | Diagonal | 2 | subject \* period |
| Total | | 13 |  | 11 |  |

|  |  |  |
| --- | --- | --- |
| **Model Dimension1** | | |
|  | | **Number of Subjects** |
| Fixed Effects | Intercept |  |
| period |  |
| treatment |  |
| sequence |  |
| Random Effects | treatment |  |
| Repeated Effects | treatment | 256 |
| Total | |  |

|  |
| --- |
| 1. Dependent Variable: lnpk. |

|  |  |
| --- | --- |
| **Information Criteria1** | |
| -2 Restricted Log Likelihood | 329.25749377 |
| Akaike's Information Criterion (AIC) | 339.25749377 |
| Hurvich and Tsai's Criterion (AICC) | 339.50339541 |
| Bozdogan's Criterion (CAIC) | 361.86479836 |
| Schwarz's Bayesian Criterion (BIC) | 356.86479836 |

|  |
| --- |
| The information criteria are displayed in smaller-is-better form.1 |
| 1. Dependent Variable: lnpk. |

Fixed Effects

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| **Type III Tests of Fixed Effects1** | | | | |
| Source | **Numerator df** | **Denominator df** | **F** | **Sig.** |
| Intercept | 1 | 62.000 | 3302.493 | .000 |
| period | 3 | 144.977 | .303 | .823 |
| treatment | 1 | 62.000 | 2.400 | .126 |
| sequence | 1 | 62.000 | 4.968 | .029 |

|  |
| --- |
| 1. Dependent Variable: lnpk. |

Covariance Parameters

|  |  |  |  |
| --- | --- | --- | --- |
| **Estimates of Covariance Parameters1** | | | |
| Parameter | | **Estimate** | **Std. Error** |
| Repeated Measures | Var: [treatment=R] | .078 | .014 |
| Var: [treatment=T] | .109 | .019 |
| treatment [subject = subject] | Var: [treatment=R] | .421 | .083 |
| Var: [treatment=T] | .378 | .078 |
| CSH rho | .980 | .029 |

|  |
| --- |
| 1. Dependent Variable: lnpk. |

Estimated Marginal Means

treatment

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| **Estimates1** | | | | | |
| treatment | **Mean** | **Std. Error** | **df** | **90% Confidence Interval** | |
| **Lower Bound** | **Upper Bound** |
| R | 4.681 | .085 | 62.000 | 4.539 | 4.822 |
| T | 4.616 | .082 | 62.000 | 4.479 | 4.753 |

|  |
| --- |
| 1. Dependent Variable: lnpk. |

|  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- |
| **Pairwise Comparisons1** | | | | | | |
| (I) treatment | (J) treatment | **Mean Difference (I-J)** | **Std. Error** | **df** | **Sig.2** | **90% Confidence Interval for Difference2** |
| **Lower Bound** |
| T | R | -.06434039 | .04153447 | 62.00000026 | .12645130 | -.13369482 |

|  |  |  |
| --- | --- | --- |
| **Pairwise Comparisons1** | | |
| (I) treatment | (J) treatment | 90% Confidence Interval for Difference |
| **Upper Bound** |
| T | R | .00501404 |

|  |
| --- |
| Based on estimated marginal means1 |
| 1. Dependent Variable: lnpk. |
| 2. Adjustment for multiple comparisons: Least Significant Difference (equivalent to no adjustments). |

|  |  |  |  |
| --- | --- | --- | --- |
| **Univariate Tests1** | | | |
| **Numerator df** | **Denominator df** | **F** | **Sig.** |
| 1 | 62.000 | 2.400 | .126 |

|  |
| --- |
| The F tests the effect of treatment. This test is based on the linearly independent pairwise comparisons among the estimated marginal means.1 |
| 1. Dependent Variable: lnpk. |

DATASET CLOSE pkdataset.

TITLE "RDS29".

RDS29

GET DATA

/TYPE=XLSX

/FILE='.\rds01.xlsx'

/SHEET=name 'rds29'

/CELLRANGE=FULL

/READNAMES=ON

/LEADINGSPACES IGNORE=YES

/TRAILINGSPACES IGNORE=YES

/DATATYPEMIN PERCENTAGE=95.0

/HIDDEN IGNORE=YES.

EXECUTE.

DATASET NAME pkdataset WINDOW=FRONT.

COMPUTE lnpk=ln(PK).

EXECUTE.

UNIANOVA lnpk BY period sequence treatment subject

/RANDOM subject

/CONTRAST(treatment)=Simple(1)

/METHOD=SSTYPE(3)

/INTERCEPT=INCLUDE

/CRITERIA=ALPHA(0.05)

/DESIGN=period sequence treatment subject(sequence).

Univariate Analysis of Variance

|  |  |  |
| --- | --- | --- |
| **Notes** | | |
| Output Created | | 28-FEB-2021 17:55:23 |
| Comments | |  |
| Input | Active Dataset | pkdataset |
| Filter | <none> |
| Weight | <none> |
| Split File | <none> |
| N of Rows in Working Data File | 41 |
| Missing Value Handling | Definition of Missing | User-defined missing values are treated as missing. |
| Cases Used | Statistics are based on all cases with valid data for all variables in the model. |
| Syntax | | UNIANOVA lnpk BY period sequence treatment subject  /RANDOM subject  /CONTRAST(treatment)=Simple(1)  /METHOD=SSTYPE(3)  /INTERCEPT=INCLUDE  /CRITERIA=ALPHA(0.05)  /DESIGN=period sequence treatment subject(sequence). |
| Resources | Processor Time | 00:00:00.02 |
| Elapsed Time | 00:00:00.02 |

|  |  |  |
| --- | --- | --- |
| **Between-Subjects Factors** | | |
|  | | **N** |
| period | 1 | 12 |
| 2 | 11 |
| 3 | 10 |
| 4 | 8 |
| sequence | RTRT | 24 |
| TRTR | 17 |
| treatment | R | 21 |
| T | 20 |
| subject | 1 | 4 |
| 3 | 3 |
| 4 | 4 |
| 6 | 2 |
| 7 | 4 |
| 11 | 4 |
| 12 | 4 |
| 15 | 4 |
| 17 | 2 |
| 18 | 3 |
| 19 | 4 |
| 20 | 3 |

|  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- |
| **Tests of Between-Subjects Effects** | | | | | | |
| Dependent Variable: lnpk | | | | | | |
| Source | | **Type III Sum of Squares** | **df** | **Mean Square** | **F** | **Sig.** |
| Intercept | Hypothesis | 713.734 | 1 | 713.734 | 1442.130 | .000 |
| Error | 5.088 | 10.281 | .4951 |  |  |
| period | Hypothesis | .268 | 3 | .089 | 1.066 | .381 |
| Error | 2.097 | 25 | .0842 |  |  |
| sequence | Hypothesis | 2.036 | 1 | 2.036 | 4.040 | .072 |
| Error | 5.143 | 10.207 | .5043 |  |  |
| treatment | Hypothesis | .011 | 1 | .011 | .136 | .716 |
| Error | 2.097 | 25 | .0842 |  |  |
| subject(sequence) | Hypothesis | 5.314 | 10 | .531 | 6.334 | .000 |
| Error | 2.097 | 25 | .0842 |  |  |

|  |
| --- |
| 1. .919 MS(subject(sequence)) + .081 MS(Error) |
| 2. MS(Error) |
| 3. .939 MS(subject(sequence)) + .061 MS(Error) |

|  |  |  |  |
| --- | --- | --- | --- |
| **Expected Mean Squares1,2** | | | |
| Source | **Variance Component** | | |
| **Var(subject(sequence))** | **Var(Error)** | **Quadratic Term** |
| Intercept | 3.064 | 1.000 | Intercept, period, sequence, treatment |
| period | .000 | 1.000 | period |
| sequence | 3.131 | 1.000 | sequence |
| treatment | .000 | 1.000 | treatment |
| subject(sequence) | 3.336 | 1.000 |  |
| Error | .000 | 1.000 |  |

|  |
| --- |
| 1. For each source, the expected mean square equals the sum of the coefficients in the cells times the variance components, plus a quadratic term involving effects in the Quadratic Term cell. |
| 2. Expected Mean Squares are based on the Type III Sums of Squares. |

Custom Hypothesis Tests

|  |  |  |  |
| --- | --- | --- | --- |
| **Contrast Results (K Matrix)** | | | |
| treatment Simple Contrast1 | | | **Dependent Variable** |
| **lnpk** |
| Level 2 vs. Level 1 | Contrast Estimate | | .034 |
| Hypothesized Value | | 0 |
| Difference (Estimate - Hypothesized) | | .034 |
| Std. Error | | .093 |
| Sig. | | .716 |
| 95% Confidence Interval for Difference | Lower Bound | -.157 |
| Upper Bound | .226 |

|  |
| --- |
| 1. Reference category = 1 |

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| **Test Results** | | | | | |
| Dependent Variable: lnpk | | | | | |
| Source | **Sum of Squares** | **df** | **Mean Square** | **F** | **Sig.** |
| Contrast | .011 | 1 | .011 | .136 | .716 |
| Error | 2.097 | 25 | .084 |  |  |

MIXED lnpk BY period sequence treatment subject

/CRITERIA=DFMETHOD(SATTERTHWAITE) CIN(95) MXITER(100) MXSTEP(10) SCORING(1)

SINGULAR(0.000000000001) HCONVERGE(0, ABSOLUTE) LCONVERGE(0, ABSOLUTE) PCONVERGE(0.000001, ABSOLUTE)

/FIXED=period sequence treatment | SSTYPE(3)

/METHOD=REML

/RANDOM= subject(sequence) | COVTYPE(ID)

/EMMEANS=TABLES(treatment) COMPARE REFCAT(FIRST) ADJ(LSD).

Mixed Model Analysis

|  |  |  |
| --- | --- | --- |
| **Notes** | | |
| Output Created | | 28-FEB-2021 17:55:23 |
| Comments | |  |
| Input | Active Dataset | pkdataset |
| Filter | <none> |
| Weight | <none> |
| Split File | <none> |
| N of Rows in Working Data File | 41 |
| Missing Value Handling | Definition of Missing | User-defined missing values are treated as missing. |
| Cases Used | Statistics are based on all cases with valid data for all variables in the model. |
| Syntax | | MIXED lnpk BY period sequence treatment subject  /CRITERIA=DFMETHOD(SATTERTHWAITE) CIN(95) MXITER(100) MXSTEP(10) SCORING(1)  SINGULAR(0.000000000001) HCONVERGE(0, ABSOLUTE) LCONVERGE(0, ABSOLUTE) PCONVERGE(0.000001, ABSOLUTE)  /FIXED=period sequence treatment | SSTYPE(3)  /METHOD=REML  /RANDOM= subject(sequence) | COVTYPE(ID)  /EMMEANS=TABLES(treatment) COMPARE REFCAT(FIRST) ADJ(LSD). |
| Resources | Processor Time | 00:00:00.02 |
| Elapsed Time | 00:00:00.29 |

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| **Model Dimension1** | | | | |
|  | | **Number of Levels** | **Covariance Structure** | **Number of Parameters** |
| Fixed Effects | Intercept | 1 |  | 1 |
| period | 4 |  | 3 |
| sequence | 2 |  | 1 |
| treatment | 2 |  | 1 |
| Random Effects | subject(sequence) | 12 | Identity | 1 |
| Residual | |  |  | 1 |
| Total | | 21 |  | 8 |

|  |
| --- |
| 1. Dependent Variable: lnpk. |

|  |  |
| --- | --- |
| **Information Criteria1** | |
| -2 Restricted Log Likelihood | 45.30491445 |
| Akaike's Information Criterion (AIC) | 49.30491445 |
| Hurvich and Tsai's Criterion (AICC) | 49.67991445 |
| Bozdogan's Criterion (CAIC) | 54.41561057 |
| Schwarz's Bayesian Criterion (BIC) | 52.41561057 |

|  |
| --- |
| The information criteria are displayed in smaller-is-better form.1 |
| 1. Dependent Variable: lnpk. |

Fixed Effects

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| **Type III Tests of Fixed Effects1** | | | | |
| Source | **Numerator df** | **Denominator df** | **F** | **Sig.** |
| Intercept | 1 | 9.729 | 1368.454 | .000 |
| period | 3 | 25.255 | 1.028 | .397 |
| sequence | 1 | 9.665 | 3.731 | .083 |
| treatment | 1 | 24.865 | .152 | .700 |

|  |
| --- |
| 1. Dependent Variable: lnpk. |

Covariance Parameters

|  |  |  |  |
| --- | --- | --- | --- |
| **Estimates of Covariance Parameters1** | | | |
| Parameter | | **Estimate** | **Std. Error** |
| Residual | | .084411 | .024009 |
| subject(sequence) | Variance | .141597 | .076820 |

|  |
| --- |
| 1. Dependent Variable: lnpk. |

Estimated Marginal Means

treatment

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| **Estimates1** | | | | | |
| treatment | **Mean** | **Std. Error** | **df** | **95% Confidence Interval** | |
| **Lower Bound** | **Upper Bound** |
| R | 4.431 | .129 | 12.829 | 4.151 | 4.710 |
| T | 4.467 | .129 | 12.746 | 4.188 | 4.746 |

|  |
| --- |
| 1. Dependent Variable: lnpk. |

|  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- |
| **Pairwise Comparisons1** | | | | | | |
| (I) treatment | (J) treatment | **Mean Difference (I-J)** | **Std. Error** | **df** | **Sig.2** | **95% Confidence Interval for Difference2** |
| **Lower Bound** |
| T | R | .03627091 | .09318262 | 24.86467067 | .70040833 | -.15569527 |

|  |  |  |
| --- | --- | --- |
| **Pairwise Comparisons1** | | |
| (I) treatment | (J) treatment | 95% Confidence Interval for Difference |
| **Upper Bound** |
| T | R | .22823709 |

|  |
| --- |
| Based on estimated marginal means1 |
| 1. Dependent Variable: lnpk. |
| 2. Adjustment for multiple comparisons: Least Significant Difference (equivalent to no adjustments). |

|  |  |  |  |
| --- | --- | --- | --- |
| **Univariate Tests1** | | | |
| **Numerator df** | **Denominator df** | **F** | **Sig.** |
| 1 | 24.865 | .152 | .700 |

|  |
| --- |
| The F tests the effect of treatment. This test is based on the linearly independent pairwise comparisons among the estimated marginal means.1 |
| 1. Dependent Variable: lnpk. |

MIXED lnpk BY period treatment sequence subject

/CRITERIA=CIN(90) MXITER(200) MXSTEP(20) SCORING(2) SINGULAR(0.000000000001) HCONVERGE(0,

RELATIVE) LCONVERGE(0.0000000000001, RELATIVE) PCONVERGE(0, RELATIVE)

/FIXED=period treatment sequence | SSTYPE(3)

/METHOD=REML

/RANDOM=treatment | SUBJECT(subject) COVTYPE(CSH)

/REPEATED=treatment | SUBJECT(subject\*period) COVTYPE(DIAG)

/EMMEANS=TABLES(treatment) COMPARE REFCAT(FIRST) ADJ(LSD).

Mixed Model Analysis

|  |  |  |
| --- | --- | --- |
| **Notes** | | |
| Output Created | | 28-FEB-2021 17:55:23 |
| Comments | |  |
| Input | Active Dataset | pkdataset |
| Filter | <none> |
| Weight | <none> |
| Split File | <none> |
| N of Rows in Working Data File | 41 |
| Missing Value Handling | Definition of Missing | User-defined missing values are treated as missing. |
| Cases Used | Statistics are based on all cases with valid data for all variables in the model. |
| Syntax | | MIXED lnpk BY period treatment sequence subject  /CRITERIA=CIN(90) MXITER(200) MXSTEP(20) SCORING(2) SINGULAR(0.000000000001) HCONVERGE(0,  RELATIVE) LCONVERGE(0.0000000000001, RELATIVE) PCONVERGE(0, RELATIVE)  /FIXED=period treatment sequence | SSTYPE(3)  /METHOD=REML  /RANDOM=treatment | SUBJECT(subject) COVTYPE(CSH)  /REPEATED=treatment | SUBJECT(subject\*period) COVTYPE(DIAG)  /EMMEANS=TABLES(treatment) COMPARE REFCAT(FIRST) ADJ(LSD). |
| Resources | Processor Time | 00:00:00.03 |
| Elapsed Time | 00:00:00.08 |

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| **Model Dimension1** | | | | | |
|  | | **Number of Levels** | **Covariance Structure** | **Number of Parameters** | **Subject Variables** |
| Fixed Effects | Intercept | 1 |  | 1 |  |
| period | 4 |  | 3 |  |
| treatment | 2 |  | 1 |  |
| sequence | 2 |  | 1 |  |
| Random Effects | treatment | 2 | Heterogeneous Compound Symmetry | 3 | subject |
| Repeated Effects | treatment | 2 | Diagonal | 2 | subject \* period |
| Total | | 13 |  | 11 |  |

|  |  |  |
| --- | --- | --- |
| **Model Dimension1** | | |
|  | | **Number of Subjects** |
| Fixed Effects | Intercept |  |
| period |  |
| treatment |  |
| sequence |  |
| Random Effects | treatment |  |
| Repeated Effects | treatment | 41 |
| Total | |  |

|  |
| --- |
| 1. Dependent Variable: lnpk. |

|  |  |
| --- | --- |
| **Information Criteria1** | |
| -2 Restricted Log Likelihood | 26.96606070 |
| Akaike's Information Criterion (AIC) | 36.96606070 |
| Hurvich and Tsai's Criterion (AICC) | 39.03502622 |
| Bozdogan's Criterion (CAIC) | 49.74280101 |
| Schwarz's Bayesian Criterion (BIC) | 44.74280101 |

|  |
| --- |
| The information criteria are displayed in smaller-is-better form.1 |
| 1. Dependent Variable: lnpk. |

Fixed Effects

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| **Type III Tests of Fixed Effects1** | | | | |
| Source | **Numerator df** | **Denominator df** | **F** | **Sig.** |
| Intercept | 1 | 9.928 | 1368.685 | .000 |
| period | 3 | 13.959 | .621 | .613 |
| treatment | 1 | 10.512 | .024 | .881 |
| sequence | 1 | 9.898 | 3.753 | .082 |

|  |
| --- |
| 1. Dependent Variable: lnpk. |

Covariance Parameters

|  |  |  |  |
| --- | --- | --- | --- |
| **Estimates of Covariance Parameters1** | | | |
| Parameter | | **Estimate** | **Std. Error** |
| Repeated Measures | Var: [treatment=R] | .041 | .020 |
| Var: [treatment=T] | .015 | .008 |
| treatment [subject = subject] | Var: [treatment=R] | .311 | .151 |
| Var: [treatment=T] | .085 | .045 |
| CSH rho | .749 | .168 |

|  |
| --- |
| 1. Dependent Variable: lnpk. |

Estimated Marginal Means

treatment

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| **Estimates1** | | | | | |
| treatment | **Mean** | **Std. Error** | **df** | **90% Confidence Interval** | |
| **Lower Bound** | **Upper Bound** |
| R | 4.445 | .170 | 10.058 | 4.137 | 4.753 |
| T | 4.464 | .090 | 9.051 | 4.299 | 4.629 |

|  |
| --- |
| 1. Dependent Variable: lnpk. |

|  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- |
| **Pairwise Comparisons1** | | | | | | |
| (I) treatment | (J) treatment | **Mean Difference (I-J)** | **Std. Error** | **df** | **Sig.2** | **90% Confidence Interval for Difference2** |
| **Lower Bound** |
| T | R | .01948867 | .12685934 | 10.51170086 | .88081540 | -.20930843 |

|  |  |  |
| --- | --- | --- |
| **Pairwise Comparisons1** | | |
| (I) treatment | (J) treatment | 90% Confidence Interval for Difference |
| **Upper Bound** |
| T | R | .24828577 |

|  |
| --- |
| Based on estimated marginal means1 |
| 1. Dependent Variable: lnpk. |
| 2. Adjustment for multiple comparisons: Least Significant Difference (equivalent to no adjustments). |

|  |  |  |  |
| --- | --- | --- | --- |
| **Univariate Tests1** | | | |
| **Numerator df** | **Denominator df** | **F** | **Sig.** |
| 1 | 10.512 | .024 | .881 |

|  |
| --- |
| The F tests the effect of treatment. This test is based on the linearly independent pairwise comparisons among the estimated marginal means.1 |
| 1. Dependent Variable: lnpk. |

DATASET CLOSE pkdataset.

TITLE "RDS30".

RDS30

GET DATA

/TYPE=XLSX

/FILE='.\rds01.xlsx'

/SHEET=name 'rds30'

/CELLRANGE=FULL

/READNAMES=ON

/LEADINGSPACES IGNORE=YES

/TRAILINGSPACES IGNORE=YES

/DATATYPEMIN PERCENTAGE=95.0

/HIDDEN IGNORE=YES.

EXECUTE.

DATASET NAME pkdataset WINDOW=FRONT.

COMPUTE lnpk=ln(PK).

EXECUTE.

UNIANOVA lnpk BY period sequence treatment subject

/RANDOM subject

/CONTRAST(treatment)=Simple(1)

/METHOD=SSTYPE(3)

/INTERCEPT=INCLUDE

/CRITERIA=ALPHA(0.05)

/DESIGN=period sequence treatment subject(sequence).

Univariate Analysis of Variance

|  |  |  |
| --- | --- | --- |
| **Notes** | | |
| Output Created | | 28-FEB-2021 17:55:24 |
| Comments | |  |
| Input | Active Dataset | pkdataset |
| Filter | <none> |
| Weight | <none> |
| Split File | <none> |
| N of Rows in Working Data File | 35 |
| Missing Value Handling | Definition of Missing | User-defined missing values are treated as missing. |
| Cases Used | Statistics are based on all cases with valid data for all variables in the model. |
| Syntax | | UNIANOVA lnpk BY period sequence treatment subject  /RANDOM subject  /CONTRAST(treatment)=Simple(1)  /METHOD=SSTYPE(3)  /INTERCEPT=INCLUDE  /CRITERIA=ALPHA(0.05)  /DESIGN=period sequence treatment subject(sequence). |
| Resources | Processor Time | 00:00:00.02 |
| Elapsed Time | 00:00:00.01 |

|  |  |  |
| --- | --- | --- |
| **Between-Subjects Factors** | | |
|  | | **N** |
| period | 1 | 14 |
| 2 | 14 |
| 3 | 7 |
| sequence | RRT | 6 |
| RTR | 13 |
| TRR | 16 |
| treatment | R | 24 |
| T | 11 |
| subject | 1 | 2 |
| 2 | 3 |
| 7 | 2 |
| 8 | 3 |
| 10 | 3 |
| 12 | 3 |
| 15 | 2 |
| 16 | 3 |
| 20 | 2 |
| 22 | 3 |
| 25 | 3 |
| 28 | 2 |
| 34 | 2 |
| 39 | 2 |

|  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- |
| **Tests of Between-Subjects Effects** | | | | | | |
| Dependent Variable: lnpk | | | | | | |
| Source | | **Type III Sum of Squares** | **df** | **Mean Square** | **F** | **Sig.** |
| Intercept | Hypothesis | 346.783 | 1 | 346.783 | 1114.514 | .000 |
| Error | 3.915 | 12.582 | .3111 |  |  |
| period | Hypothesis | .032 | 2 | .016 | .374 | .693 |
| Error | .762 | 18 | .0422 |  |  |
| sequence | Hypothesis | .021 | 2 | .011 | .022 | .979 |
| Error | 5.476 | 11.310 | .4843 |  |  |
| treatment | Hypothesis | .031 | 1 | .031 | .734 | .403 |
| Error | .762 | 18 | .0422 |  |  |
| subject(sequence) | Hypothesis | 6.240 | 11 | .567 | 13.392 | .000 |
| Error | .762 | 18 | .0422 |  |  |

|  |
| --- |
| 1. .512 MS(subject(sequence)) + .488 MS(Error) |
| 2. MS(Error) |
| 3. .842 MS(subject(sequence)) + .158 MS(Error) |

|  |  |  |  |
| --- | --- | --- | --- |
| **Expected Mean Squares1,2** | | | |
| Source | **Variance Component** | | |
| **Var(subject(sequence))** | **Var(Error)** | **Quadratic Term** |
| Intercept | 1.270 | 1.000 | Intercept, period, sequence, treatment |
| period | .000 | 1.000 | period |
| sequence | 2.088 | 1.000 | sequence |
| treatment | .000 | 1.000 | treatment |
| subject(sequence) | 2.480 | 1.000 |  |
| Error | .000 | 1.000 |  |

|  |
| --- |
| 1. For each source, the expected mean square equals the sum of the coefficients in the cells times the variance components, plus a quadratic term involving effects in the Quadratic Term cell. |
| 2. Expected Mean Squares are based on the Type III Sums of Squares. |

Custom Hypothesis Tests

|  |  |  |  |
| --- | --- | --- | --- |
| **Contrast Results (K Matrix)** | | | |
| treatment Simple Contrast1 | | | **Dependent Variable** |
| **lnpk** |
| Level 2 vs. Level 1 | Contrast Estimate | | -.075 |
| Hypothesized Value | | 0 |
| Difference (Estimate - Hypothesized) | | -.075 |
| Std. Error | | .088 |
| Sig. | | .403 |
| 95% Confidence Interval for Difference | Lower Bound | -.260 |
| Upper Bound | .110 |

|  |
| --- |
| 1. Reference category = 1 |

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| **Test Results** | | | | | |
| Dependent Variable: lnpk | | | | | |
| Source | **Sum of Squares** | **df** | **Mean Square** | **F** | **Sig.** |
| Contrast | .031 | 1 | .031 | .734 | .403 |
| Error | .762 | 18 | .042 |  |  |

MIXED lnpk BY period sequence treatment subject

/CRITERIA=DFMETHOD(SATTERTHWAITE) CIN(95) MXITER(100) MXSTEP(10) SCORING(1)

SINGULAR(0.000000000001) HCONVERGE(0, ABSOLUTE) LCONVERGE(0, ABSOLUTE) PCONVERGE(0.000001, ABSOLUTE)

/FIXED=period sequence treatment | SSTYPE(3)

/METHOD=REML

/RANDOM= subject(sequence) | COVTYPE(ID)

/EMMEANS=TABLES(treatment) COMPARE REFCAT(FIRST) ADJ(LSD).

Mixed Model Analysis

|  |  |  |
| --- | --- | --- |
| **Notes** | | |
| Output Created | | 28-FEB-2021 17:55:24 |
| Comments | |  |
| Input | Active Dataset | pkdataset |
| Filter | <none> |
| Weight | <none> |
| Split File | <none> |
| N of Rows in Working Data File | 35 |
| Missing Value Handling | Definition of Missing | User-defined missing values are treated as missing. |
| Cases Used | Statistics are based on all cases with valid data for all variables in the model. |
| Syntax | | MIXED lnpk BY period sequence treatment subject  /CRITERIA=DFMETHOD(SATTERTHWAITE) CIN(95) MXITER(100) MXSTEP(10) SCORING(1)  SINGULAR(0.000000000001) HCONVERGE(0, ABSOLUTE) LCONVERGE(0, ABSOLUTE) PCONVERGE(0.000001, ABSOLUTE)  /FIXED=period sequence treatment | SSTYPE(3)  /METHOD=REML  /RANDOM= subject(sequence) | COVTYPE(ID)  /EMMEANS=TABLES(treatment) COMPARE REFCAT(FIRST) ADJ(LSD). |
| Resources | Processor Time | 00:00:00.02 |
| Elapsed Time | 00:00:00.02 |

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| **Model Dimension1** | | | | |
|  | | **Number of Levels** | **Covariance Structure** | **Number of Parameters** |
| Fixed Effects | Intercept | 1 |  | 1 |
| period | 3 |  | 2 |
| sequence | 3 |  | 2 |
| treatment | 2 |  | 1 |
| Random Effects | subject(sequence) | 14 | Identity | 1 |
| Residual | |  |  | 1 |
| Total | | 23 |  | 8 |

|  |
| --- |
| 1. Dependent Variable: lnpk. |

|  |  |
| --- | --- |
| **Information Criteria1** | |
| -2 Restricted Log Likelihood | 32.41804784 |
| Akaike's Information Criterion (AIC) | 36.41804784 |
| Hurvich and Tsai's Criterion (AICC) | 36.87958631 |
| Bozdogan's Criterion (CAIC) | 41.15263950 |
| Schwarz's Bayesian Criterion (BIC) | 39.15263950 |

|  |
| --- |
| The information criteria are displayed in smaller-is-better form.1 |
| 1. Dependent Variable: lnpk. |

Fixed Effects

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| **Type III Tests of Fixed Effects1** | | | | |
| Source | **Numerator df** | **Denominator df** | **F** | **Sig.** |
| Intercept | 1 | 12.315 | 994.888 | .000 |
| period | 2 | 18.014 | .385 | .686 |
| sequence | 2 | 11.168 | .013 | .987 |
| treatment | 1 | 17.864 | .731 | .404 |

|  |
| --- |
| 1. Dependent Variable: lnpk. |

Covariance Parameters

|  |  |  |  |
| --- | --- | --- | --- |
| **Estimates of Covariance Parameters1** | | | |
| Parameter | | **Estimate** | **Std. Error** |
| Residual | | .042518 | .014226 |
| subject(sequence) | Variance | .231839 | .107308 |

|  |
| --- |
| 1. Dependent Variable: lnpk. |

Estimated Marginal Means

treatment

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| **Estimates1** | | | | | |
| treatment | **Mean** | **Std. Error** | **df** | **95% Confidence Interval** | |
| **Lower Bound** | **Upper Bound** |
| R | 4.575 | .142 | 11.573 | 4.266 | 4.885 |
| T | 4.500 | .159 | 17.467 | 4.165 | 4.834 |

|  |
| --- |
| 1. Dependent Variable: lnpk. |

|  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- |
| **Pairwise Comparisons1** | | | | | | |
| (I) treatment | (J) treatment | **Mean Difference (I-J)** | **Std. Error** | **df** | **Sig.2** | **95% Confidence Interval for Difference2** |
| **Lower Bound** |
| T | R | -.07543813 | .08821036 | 17.86417213 | .40376099 | -.26086229 |

|  |  |  |
| --- | --- | --- |
| **Pairwise Comparisons1** | | |
| (I) treatment | (J) treatment | 95% Confidence Interval for Difference |
| **Upper Bound** |
| T | R | .10998602 |

|  |
| --- |
| Based on estimated marginal means1 |
| 1. Dependent Variable: lnpk. |
| 2. Adjustment for multiple comparisons: Least Significant Difference (equivalent to no adjustments). |

|  |  |  |  |
| --- | --- | --- | --- |
| **Univariate Tests1** | | | |
| **Numerator df** | **Denominator df** | **F** | **Sig.** |
| 1 | 17.864 | .731 | .404 |

|  |
| --- |
| The F tests the effect of treatment. This test is based on the linearly independent pairwise comparisons among the estimated marginal means.1 |
| 1. Dependent Variable: lnpk. |

MIXED lnpk BY period treatment sequence subject

/CRITERIA=CIN(90) MXITER(200) MXSTEP(20) SCORING(2) SINGULAR(0.000000000001) HCONVERGE(0,

RELATIVE) LCONVERGE(0.0000000000001, RELATIVE) PCONVERGE(0, RELATIVE)

/FIXED=period treatment sequence | SSTYPE(3)

/METHOD=REML

/RANDOM=treatment | SUBJECT(subject) COVTYPE(CSH)

/REPEATED=treatment | SUBJECT(subject\*period) COVTYPE(DIAG)

/EMMEANS=TABLES(treatment) COMPARE REFCAT(FIRST) ADJ(LSD).

Mixed Model Analysis

|  |  |  |
| --- | --- | --- |
| **Notes** | | |
| Output Created | | 28-FEB-2021 17:55:24 |
| Comments | |  |
| Input | Active Dataset | pkdataset |
| Filter | <none> |
| Weight | <none> |
| Split File | <none> |
| N of Rows in Working Data File | 35 |
| Missing Value Handling | Definition of Missing | User-defined missing values are treated as missing. |
| Cases Used | Statistics are based on all cases with valid data for all variables in the model. |
| Syntax | | MIXED lnpk BY period treatment sequence subject  /CRITERIA=CIN(90) MXITER(200) MXSTEP(20) SCORING(2) SINGULAR(0.000000000001) HCONVERGE(0,  RELATIVE) LCONVERGE(0.0000000000001, RELATIVE) PCONVERGE(0, RELATIVE)  /FIXED=period treatment sequence | SSTYPE(3)  /METHOD=REML  /RANDOM=treatment | SUBJECT(subject) COVTYPE(CSH)  /REPEATED=treatment | SUBJECT(subject\*period) COVTYPE(DIAG)  /EMMEANS=TABLES(treatment) COMPARE REFCAT(FIRST) ADJ(LSD). |
| Resources | Processor Time | 00:00:00.08 |
| Elapsed Time | 00:00:00.14 |

|  |
| --- |
| **Warnings** |
| Iteration was terminated but convergence has not been achieved. The MIXED procedure continues despite this warning. Subsequent results produced are based on the last iteration. Validity of the model fit is uncertain. |

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| **Model Dimension1** | | | | | |
|  | | **Number of Levels** | **Covariance Structure** | **Number of Parameters** | **Subject Variables** |
| Fixed Effects | Intercept | 1 |  | 1 |  |
| period | 3 |  | 2 |  |
| treatment | 2 |  | 1 |  |
| sequence | 3 |  | 2 |  |
| Random Effects | treatment | 2 | Heterogeneous Compound Symmetry | 3 | subject |
| Repeated Effects | treatment | 2 | Diagonal | 2 | subject \* period |
| Total | | 13 |  | 11 |  |

|  |  |  |
| --- | --- | --- |
| **Model Dimension1** | | |
|  | | **Number of Subjects** |
| Fixed Effects | Intercept |  |
| period |  |
| treatment |  |
| sequence |  |
| Random Effects | treatment |  |
| Repeated Effects | treatment | 35 |
| Total | |  |

|  |
| --- |
| 1. Dependent Variable: lnpk. |

|  |  |
| --- | --- |
| **Information Criteria1** | |
| -2 Restricted Log Likelihood | 14.94403807 |
| Akaike's Information Criterion (AIC) | 24.94403807 |
| Hurvich and Tsai's Criterion (AICC) | 27.55273372 |
| Bozdogan's Criterion (CAIC) | 36.78051722 |
| Schwarz's Bayesian Criterion (BIC) | 31.78051722 |

|  |
| --- |
| The information criteria are displayed in smaller-is-better form.1 |
| 1. Dependent Variable: lnpk. |

Fixed Effects

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| **Type III Tests of Fixed Effects1** | | | | |
| Source | **Numerator df** | **Denominator df** | **F** | **Sig.** |
| Intercept | 1 | . | .000 | . |
| period | 2 | . | .193 | . |
| treatment | 1 | . | .824 | . |
| sequence | 2 | . | .068 | . |

|  |
| --- |
| 1. Dependent Variable: lnpk. |

Covariance Parameters

|  |  |  |  |
| --- | --- | --- | --- |
| **Estimates of Covariance Parameters1** | | | |
| Parameter | | **Estimate** | **Std. Error** |
| Repeated Measures | Var: [treatment=R] | .0552 | .000 |
| Var: [treatment=T] | 3.468E-92 | .000 |
| treatment [subject = subject] | Var: [treatment=R] | .1842 | .000 |
| Var: [treatment=T] | .1612 | .000 |
| CSH rho | .9332 | .000 |

|  |
| --- |
| 1. Dependent Variable: lnpk. |
| 2. This covariance parameter is redundant. |

Estimated Marginal Means

treatment

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| **Estimates1** | | | | | |
| treatment | **Mean** | **Std. Error** | **df** | **90% Confidence Interval** | |
| **Lower Bound** | **Upper Bound** |
| R | 3.868 | 343.256 | . | . | . |
| T | 3.791 | 343.256 | . | . | . |

|  |
| --- |
| 1. Dependent Variable: lnpk. |

|  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- |
| **Pairwise Comparisons1** | | | | | | |
| (I) treatment | (J) treatment | **Mean Difference (I-J)** | **Std. Error** | **df** | **Sig.2** | **90% Confidence Interval for Difference2** |
| **Lower Bound** |
| T | R | -.07702835 | .08485922 | . | . | . |

|  |  |  |
| --- | --- | --- |
| **Pairwise Comparisons1** | | |
| (I) treatment | (J) treatment | 90% Confidence Interval for Difference |
| **Upper Bound** |
| T | R | . |

|  |
| --- |
| Based on estimated marginal means1 |
| 1. Dependent Variable: lnpk. |
| 2. Adjustment for multiple comparisons: Least Significant Difference (equivalent to no adjustments). |

|  |  |  |  |
| --- | --- | --- | --- |
| **Univariate Tests1** | | | |
| **Numerator df** | **Denominator df** | **F** | **Sig.** |
| 1 | . | .824 | . |

|  |
| --- |
| The F tests the effect of treatment. This test is based on the linearly independent pairwise comparisons among the estimated marginal means.1 |
| 1. Dependent Variable: lnpk. |

DATASET CLOSE pkdataset.

OUTPUT MODIFY

/REPORT PRINTREPORT=NO

/SELECT TABLES

/IF SUBTYPES=["EMMEANS Pairwise Comparisons"]

/DELETEOBJECT DELETE=NO

/OBJECTPROPERTIES VISIBLE=ASIS

/TABLECELLS SELECT=[BODY] SELECTCONDITION=ALL FORMAT="F.8" APPLYTO=CELL.

OUTPUT MODIFY

/REPORT PRINTREPORT=NO

/SELECT TABLES

/IF SUBTYPES=["Information Criteria"]

/DELETEOBJECT DELETE=NO

/OBJECTPROPERTIES VISIBLE=ASIS

/TABLECELLS SELECT=[BODY] SELECTCONDITION=ALL FORMAT="F.8" APPLYTO=CELL.