Level-1 Descriptive Statistics for Chapter 20 Example Data

**Summarize**

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| **Notes** | | |
| Output Created | | 30-JUL-2025 14:38:49 |
| Comments | |  |
| Input | Active Dataset | Chapter21 |
| Filter | <none> |
| Weight | <none> |
| Split File | <none> |
| N of Rows in Working Data File | 800 |
| Missing Value Handling | Definition of Missing | For each dependent variable in a table, user-defined missing values for the dependent and all grouping variables are treated as missing. |
| Cases Used | Cases used for each table have no missing values in any independent variable, and not all dependent variables have missing values. |
| Syntax | | SUMMARIZE /TABLES = age time game WPgame dep /FORMAT = NOLIST TOTAL /CELLS = COUNT MEAN STDDEV VARIANCE MIN MAX. |
| Resources | Processor Time | 00:00:00.00 |
| Elapsed Time | 00:00:00.00 |

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| **Case Processing Summary** | | | | | | |
|  | Cases | | | | | |
| Included | | Excluded | | Total | |
| N | Percent | N | Percent | N | Percent |
| age: Exact Time-Varying Age | 800 | 100.0% | 0 | 0.0% | 800 | 100.0% |
| time: Exact Time Since Baseline | 800 | 100.0% | 0 | 0.0% | 800 | 100.0% |
| game: Hours Daily Gaming Per Occasion | 800 | 100.0% | 0 | 0.0% | 800 | 100.0% |
| WPgame: Hours Daily Gaming Per Occasion Centered at Person Mean | 800 | 100.0% | 0 | 0.0% | 800 | 100.0% |
| dep: Depression Per Occasion | 800 | 100.0% | 0 | 0.0% | 800 | 100.0% |

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| **Report** | | | | | |
|  | age: Exact Time-Varying Age | time: Exact Time Since Baseline | game: Hours Daily Gaming Per Occasion | WPgame: Hours Daily Gaming Per Occasion Centered at Person Mean | dep: Depression Per Occasion |
| N | 800 | 800 | 800 | 800 | 800 |
| Mean | 11.3987 | 1.5000 | 3.10 | .0000 | 9.58 |
| Std. Deviation | 1.29747 | 1.12150 | 1.371 | .86891 | 3.611 |
| Variance | 1.683 | 1.258 | 1.880 | .755 | 13.042 |
| Minimum | 8.20 | .00 | 0 | -2.50 | 0 |
| Maximum | 15.18 | 3.31 | 7 | 2.50 | 20 |

Level-2 Descriptive Statistics for Chapter 20 Example Data

**Summarize**

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| **Notes** | | |
| Output Created | | 30-JUL-2025 14:38:49 |
| Comments | |  |
| Input | Active Dataset | Chapter21 |
| Filter | First Occasion=1 |
| Weight | <none> |
| Split File | <none> |
| N of Rows in Working Data File | 200 |
| Missing Value Handling | Definition of Missing | For each dependent variable in a table, user-defined missing values for the dependent and all grouping variables are treated as missing. |
| Cases Used | Cases used for each table have no missing values in any independent variable, and not all dependent variables have missing values. |
| Syntax | | SUMMARIZE /TABLES = baseage PMgame /FORMAT = NOLIST TOTAL /CELLS = COUNT MEAN STDDEV VARIANCE MIN MAX. |
| Resources | Processor Time | 00:00:00.00 |
| Elapsed Time | 00:00:00.01 |

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| **Case Processing Summary** | | | | | | |
|  | Cases | | | | | |
| Included | | Excluded | | Total | |
| N | Percent | N | Percent | N | Percent |
| baseage: Exact Age at Baseline | 200 | 100.0% | 0 | 0.0% | 200 | 100.0% |
| PMgame: Person Mean of Hours Daily Gaming over Occasions | 200 | 100.0% | 0 | 0.0% | 200 | 100.0% |

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| **Report** | | |
|  | baseage: Exact Age at Baseline | PMgame: Person Mean of Hours Daily Gaming over Occasions |
| N | 200 | 200 |
| Mean | 9.8987 | 3.1037 |
| Std. Deviation | .64761 | 1.06281 |
| Variance | .419 | 1.130 |
| Minimum | 8.20 | .75 |
| Maximum | 12.12 | 6.25 |

Model 1: Empty Means, Random Intercept to Get ICC for Depression Outcome

**Mixed Model Analysis**

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| **Notes** | | |
| Output Created | | 30-JUL-2025 14:38:49 |
| Comments | |  |
| Input | Active Dataset | Chapter21 |
| Filter | <none> |
| Weight | <none> |
| Split File | <none> |
| N of Rows in Working Data File | 800 |
| Missing Value Handling | Definition of Missing | User-defined missing values are treated as valid data. |
| Cases Used | Statistics are based on all cases with valid data for all variables in the model. |
| Weight Handling | | not applicable |
| Syntax | | MIXED dep BY PersonID /METHOD = ML /CRITERIA = DFMETHOD(SATTERTHWAITE) /PRINT = SOLUTION TESTCOV /FIXED = /RANDOM = INTERCEPT | COVTYPE(VC) SUBJECT(PersonID). |
| Resources | Processor Time | 00:00:00.03 |
| Elapsed Time | 00:00:00.06 |

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| **Warnings** |
| A(n) FIXED subcommand has no specifications and will therefore be ignored. |

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| **Model Dimension**a | | | | | |
|  | | Number of Levels | Covariance Structure | Number of Parameters | Subject Variables |
| Fixed Effects | Intercept | 1 |  | 1 |  |
| Random Effects | Intercept | 1 | Variance Components | 1 | PersonID |
| Residual | |  |  | 1 |  |
| Total | | 2 |  | 3 |  |
| a. Dependent Variable: dep: Depression Per Occasion. | | | | | |

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| **Information Criteria**a | |
| -2 Log Likelihood | 4135.73503786 |
| Akaike's Information Criterion (AIC) | 4141.73503786 |
| Hurvich and Tsai's Criterion (AICC) | 4141.76518861 |
| Bozdogan's Criterion (CAIC) | 4158.78887304 |
| Schwarz's Bayesian Criterion (BIC) | 4155.78887304 |
| The information criteria are displayed in smaller-is-better form.a | |
| a. Dependent Variable: dep: Depression Per Occasion. | |

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| **Coefficients of Determination** | | |
| Pseudo-R Square Measures | Marginal | .000 |
| Conditional | .450 |

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| **Intraclass Correlation Coefficients** | | |
| Overall ICCs | Adjusted | .450 |
| Conditional | .450 |

**Fixed Effects**

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| --- | --- | --- | --- | --- |
| **Type III Tests of Fixed Effects**a | | | | |
| Source | Numerator df | Denominator df | F | Sig. |
| Intercept | 1 | 200.000 | 2398.062 | <.001 |
| a. Dependent Variable: dep: Depression Per Occasion. | | | | |

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| **Estimates of Fixed Effects**a | | | | | | | |
| Parameter | Estimate | Std. Error | df | t | Sig. | 95% Confidence Interval | |
| Lower Bound | Upper Bound |
| Intercept | 9.581 | .196 | 200.000 | 48.970 | <.001 | 9.195 | 9.967 |
| a. Dependent Variable: dep: Depression Per Occasion. | | | | | | | |

**Covariance Parameters**

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| --- | --- | --- | --- | --- | --- | --- |
| **Estimates of Covariance Parameters**a | | | | | | |
| Parameter | | Estimate | Std. Error | Wald Z | Sig. | 95% Confidence Interval |
| Lower Bound |
| Residual | | 7.160 | .413 | 17.321 | <.001 | 6.394 |
| Intercept [subject = PersonID] | Variance | 5.866 | .773 | 7.593 | <.001 | 4.532 |

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| **Estimates of Covariance Parameters**a | | | |
| Parameter | | 95% Confidence Interval | |
| Upper Bound | |
| Residual | | 8.017 | |
| Intercept [subject = PersonID] | Variance | 7.594 | |
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| a. Dependent Variable: dep: Depression Per Occasion. |

Model 2a: Rounded Saturated Means, Random Intercept to Get Mean Trajectory

**Mixed Model Analysis**

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| **Notes** | | |
| Output Created | | 30-JUL-2025 14:46:43 |
| Comments | |  |
| Input | Active Dataset | Chapter21 |
| Filter | <none> |
| Weight | <none> |
| Split File | <none> |
| N of Rows in Working Data File | 800 |
| Missing Value Handling | Definition of Missing | User-defined missing values are treated as valid data. |
| Cases Used | Statistics are based on all cases with valid data for all variables in the model. |
| Weight Handling | | not applicable |
| Syntax | | MIXED dep BY PersonID roundtime /METHOD = ML /CRITERIA = DFMETHOD(SATTERTHWAITE) /PRINT = SOLUTION TESTCOV /FIXED = roundtime | NOINT /RANDOM = INTERCEPT | COVTYPE(VC) SUBJECT(PersonID). |
| Resources | Processor Time | 00:00:00.03 |
| Elapsed Time | 00:00:00.03 |

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| **Model Dimension**a | | | | | |
|  | | Number of Levels | Covariance Structure | Number of Parameters | Subject Variables |
| Fixed Effects | roundtime | 4 |  | 4 |  |
| Random Effects | Intercept | 1 | Variance Components | 1 | PersonID |
| Residual | |  |  | 1 |  |
| Total | | 5 |  | 6 |  |
| a. Dependent Variable: dep: Depression Per Occasion. | | | | | |

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| **Information Criteria**a | |
| -2 Log Likelihood | 3996.68437920 |
| Akaike's Information Criterion (AIC) | 4008.68437920 |
| Hurvich and Tsai's Criterion (AICC) | 4008.79030606 |
| Bozdogan's Criterion (CAIC) | 4042.79204957 |
| Schwarz's Bayesian Criterion (BIC) | 4036.79204957 |
| The information criteria are displayed in smaller-is-better form.a | |
| a. Dependent Variable: dep: Depression Per Occasion. | |

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| **Coefficients of Determination** | | |
| Pseudo-R Square Measures | Marginal | .085 |
| Conditional | .564 |

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| **Intraclass Correlation Coefficients** | | |
| Overall ICCs | Adjusted | .523 |
| Conditional | .479 |

**Fixed Effects**

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| **Type III Tests of Fixed Effects**a | | | | |
| Source | Numerator df | Denominator df | F | Sig. |
| roundtime | 4 | 399.329 | 638.636 | <.001 |
| a. Dependent Variable: dep: Depression Per Occasion. | | | | |

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| **Estimates of Fixed Effects**a | | | | | | | |
| Parameter | Estimate | Std. Error | df | t | Sig. | 95% Confidence Interval | |
| Lower Bound | Upper Bound |
| [roundtime=0] | 8.225 | .244 | 439.104 | 33.698 | <.001 | 7.745 | 8.705 |
| [roundtime=1] | 9.080 | .244 | 439.104 | 37.201 | <.001 | 8.600 | 9.560 |
| [roundtime=2] | 9.950 | .244 | 439.104 | 40.765 | <.001 | 9.470 | 10.430 |
| [roundtime=3] | 11.070 | .244 | 439.104 | 45.354 | <.001 | 10.590 | 11.550 |
| a. Dependent Variable: dep: Depression Per Occasion. | | | | | | | |

**Covariance Parameters**

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| **Estimates of Covariance Parameters**a | | | | | | |
| Parameter | | Estimate | Std. Error | Wald Z | Sig. | 95% Confidence Interval |
| Lower Bound |
| Residual | | 5.679 | .328 | 17.321 | <.001 | 5.071 |
| Intercept [subject = PersonID] | Variance | 6.237 | .770 | 8.099 | <.001 | 4.896 |

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| **Estimates of Covariance Parameters**a | | | |
| Parameter | | 95% Confidence Interval | |
| Upper Bound | |
| Residual | | 6.359 | |
| Intercept [subject = PersonID] | Variance | 7.944 | |
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| a. Dependent Variable: dep: Depression Per Occasion. |

Model 2b: Rounded Saturated Means, Unstructured Variances

**Mixed Model Analysis**

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| **Notes** | | |
| Output Created | | 30-JUL-2025 14:47:17 |
| Comments | |  |
| Input | Active Dataset | Chapter21 |
| Filter | <none> |
| Weight | <none> |
| Split File | <none> |
| N of Rows in Working Data File | 800 |
| 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 dep BY PersonID roundtime /METHOD = ML /CRITERIA = DFMETHOD(SATTERTHWAITE) /PRINT = SOLUTION TESTCOV R /FIXED = roundtime | NOINT /REPEATED = roundtime | COVTYPE(UN) SUBJECT(PersonID). |
| Resources | Processor Time | 00:00:00.03 |
| Elapsed Time | 00:00:00.04 |

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| **Model Dimension**a | | | | | |
|  | | Number of Levels | Covariance Structure | Number of Parameters | Subject Variables |
| Fixed Effects | roundtime | 4 |  | 4 |  |
| Repeated Effects | roundtime | 4 | Unstructured | 10 | PersonID |
| Total | | 8 |  | 14 |  |

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| **Model Dimension**a | | |
|  | | Number of Subjects |
| Fixed Effects | roundtime |  |
| Repeated Effects | roundtime | 200 |
| Total | |  |
|  |  |  |  |  |  |

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| a. Dependent Variable: dep: Depression Per Occasion. |

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| **Information Criteria**a | |
| -2 Log Likelihood | 3962.83710373 |
| Akaike's Information Criterion (AIC) | 3990.83710373 |
| Hurvich and Tsai's Criterion (AICC) | 3991.37213558 |
| Bozdogan's Criterion (CAIC) | 4070.42166792 |
| Schwarz's Bayesian Criterion (BIC) | 4056.42166792 |
| The information criteria are displayed in smaller-is-better form.a | |
| a. Dependent Variable: dep: Depression Per Occasion. | |

**Fixed Effects**

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| **Type III Tests of Fixed Effects**a | | | | |
| Source | Numerator df | Denominator df | F | Sig. |
| roundtime | 4 | 200.000 | 605.280 | <.001 |
| a. Dependent Variable: dep: Depression Per Occasion. | | | | |

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| **Estimates of Fixed Effects**a | | | | | | | |
| Parameter | Estimate | Std. Error | df | t | Sig. | 95% Confidence Interval | |
| Lower Bound | Upper Bound |
| [roundtime=0] | 8.225 | .236 | 200.000 | 34.812 | <.001 | 7.759 | 8.691 |
| [roundtime=1] | 9.080 | .229 | 200.000 | 39.565 | <.001 | 8.627 | 9.533 |
| [roundtime=2] | 9.950 | .238 | 200.000 | 41.735 | <.001 | 9.480 | 10.420 |
| [roundtime=3] | 11.070 | .270 | 200.000 | 40.979 | <.001 | 10.537 | 11.603 |
| a. Dependent Variable: dep: Depression Per Occasion. | | | | | | | |

**Covariance Parameters**

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| **Estimates of Covariance Parameters**a | | | | | | |
| Parameter | | Estimate | Std. Error | Wald Z | Sig. | 95% Confidence Interval |
| Lower Bound |
| Repeated Measures | UN (1,1) | 11.164 | 1.116 | 10.000 | <.001 | 9.177 |
| UN (2,1) | 6.577 | .897 | 7.334 | <.001 | 4.819 |
| UN (2,2) | 10.534 | 1.053 | 10.000 | <.001 | 8.659 |
| UN (3,1) | 5.601 | .890 | 6.296 | <.001 | 3.858 |
| UN (3,2) | 6.054 | .884 | 6.846 | <.001 | 4.321 |
| UN (3,3) | 11.368 | 1.137 | 10.000 | <.001 | 9.344 |
| UN (4,1) | 5.224 | .975 | 5.357 | <.001 | 3.313 |
| UN (4,2) | 6.029 | .975 | 6.185 | <.001 | 4.119 |
| UN (4,3) | 7.934 | 1.070 | 7.417 | <.001 | 5.837 |
| UN (4,4) | 14.595 | 1.460 | 10.000 | <.001 | 11.997 |

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| **Estimates of Covariance Parameters**a | | | |
| Parameter | | 95% Confidence Interval | |
| Upper Bound | |
| Repeated Measures | UN (1,1) | 13.582 | |
| UN (2,1) | 8.335 | |
| UN (2,2) | 12.814 | |
| UN (3,1) | 7.345 | |
| UN (3,2) | 7.787 | |
| UN (3,3) | 13.829 | |
| UN (4,1) | 7.136 | |
| UN (4,2) | 7.940 | |
| UN (4,3) | 10.030 | |
| UN (4,4) | 17.755 | |
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| a. Dependent Variable: dep: Depression Per Occasion. |

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| **Residual Covariance (R) Matrix**a | | | | |
|  | [roundtime = 0] | [roundtime = 1] | [roundtime = 2] | [roundtime = 3] |
| [roundtime = 0] | 11.164 | 6.577 | 5.601 | 5.224 |
| [roundtime = 1] | 6.577 | 10.534 | 6.054 | 6.029 |
| [roundtime = 2] | 5.601 | 6.054 | 11.368 | 7.934 |
| [roundtime = 3] | 5.224 | 6.029 | 7.934 | 14.595 |
| Unstructureda | | | | |
| a. Dependent Variable: dep: Depression Per Occasion. | | | | |

Model 3: Random Linear Change

**Mixed Model Analysis**

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| **Notes** | | |
| Output Created | | 30-JUL-2025 14:47:31 |
| Comments | |  |
| Input | Active Dataset | Chapter21 |
| Filter | <none> |
| Weight | <none> |
| Split File | <none> |
| N of Rows in Working Data File | 800 |
| Missing Value Handling | Definition of Missing | User-defined missing values are treated as valid data. |
| Cases Used | Statistics are based on all cases with valid data for all variables in the model. |
| Weight Handling | | not applicable |
| Syntax | | MIXED dep BY PersonID WITH time /METHOD = ML /CRITERIA = DFMETHOD(SATTERTHWAITE) /PRINT = SOLUTION TESTCOV /FIXED = time /RANDOM = INTERCEPT time | COVTYPE(UN) SUBJECT(PersonID). |
| Resources | Processor Time | 00:00:00.05 |
| Elapsed Time | 00:00:00.04 |

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| --- | --- | --- | --- | --- | --- |
| **Model Dimension**a | | | | | |
|  | | Number of Levels | Covariance Structure | Number of Parameters | Subject Variables |
| Fixed Effects | Intercept | 1 |  | 1 |  |
| time | 1 |  | 1 |  |
| Random Effects | Intercept + time | 2 | Unstructured | 3 | PersonID |
| Residual | |  |  | 1 |  |
| Total | | 4 |  | 6 |  |
| a. Dependent Variable: dep: Depression Per Occasion. | | | | | |

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| **Information Criteria**a | |
| -2 Log Likelihood | 3960.14546900 |
| Akaike's Information Criterion (AIC) | 3972.14546900 |
| Hurvich and Tsai's Criterion (AICC) | 3972.25139586 |
| Bozdogan's Criterion (CAIC) | 4006.25313936 |
| Schwarz's Bayesian Criterion (BIC) | 4000.25313936 |
| The information criteria are displayed in smaller-is-better form.a | |
| a. Dependent Variable: dep: Depression Per Occasion. | |

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| **Coefficients of Determination** | | |
| Pseudo-R Square Measures | Marginal | .087 |
| Conditional | .665 |

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| **Intraclass Correlation Coefficients** | | |
| Overall ICCs | Adjusted | .634 |
| Conditional | .578 |

**Fixed Effects**

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| --- | --- | --- | --- | --- |
| **Type III Tests of Fixed Effects**a | | | | |
| Source | Numerator df | Denominator df | F | Sig. |
| Intercept | 1 | 199.972 | 1326.285 | <.001 |
| time | 1 | 199.739 | 108.814 | <.001 |
| a. Dependent Variable: dep: Depression Per Occasion. | | | | |

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| --- | --- | --- | --- | --- | --- | --- | --- |
| **Estimates of Fixed Effects**a | | | | | | | |
| Parameter | Estimate | Std. Error | df | t | Sig. | 95% Confidence Interval | |
| Lower Bound | Upper Bound |
| Intercept | 8.155 | .224 | 199.972 | 36.418 | <.001 | 7.714 | 8.597 |
| time | .948 | .091 | 199.739 | 10.431 | <.001 | .769 | 1.127 |
| a. Dependent Variable: dep: Depression Per Occasion. | | | | | | | |

**Covariance Parameters**

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| --- | --- | --- | --- | --- | --- | --- |
| **Estimates of Covariance Parameters**a | | | | | | |
| Parameter | | Estimate | Std. Error | Wald Z | Sig. | 95% Confidence Interval |
| Lower Bound |
| Residual | | 4.341 | .307 | 14.147 | <.001 | 3.779 |
| Intercept + time [subject = PersonID] | UN (1,1) | 6.995 | 1.026 | 6.821 | <.001 | 5.248 |
| UN (2,1) | -.747 | .335 | -2.232 | .026 | -1.404 |
| UN (2,2) | .785 | .176 | 4.457 | <.001 | .505 |

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| **Estimates of Covariance Parameters**a | | | |
| Parameter | | 95% Confidence Interval | |
| Upper Bound | |
| Residual | | 4.986 | |
| Intercept + time [subject = PersonID] | UN (1,1) | 9.323 | |
| UN (2,1) | -.091 | |
| UN (2,2) | 1.218 | |
|  |  |  |  | |  |  |  |

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| a. Dependent Variable: dep: Depression Per Occasion. |

Model 4: Random Linear Change Moderated by Age at Baseline

**Mixed Model Analysis**

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| **Notes** | | |
| Output Created | | 30-JUL-2025 14:47:39 |
| Comments | |  |
| Input | Active Dataset | Chapter21 |
| Filter | <none> |
| Weight | <none> |
| Split File | <none> |
| N of Rows in Working Data File | 800 |
| Missing Value Handling | Definition of Missing | User-defined missing values are treated as valid data. |
| Cases Used | Statistics are based on all cases with valid data for all variables in the model. |
| Weight Handling | | not applicable |
| Syntax | | MIXED dep BY PersonID WITH time baseage10 /METHOD = ML /CRITERIA = DFMETHOD(SATTERTHWAITE) /PRINT = SOLUTION TESTCOV /FIXED = time baseage10 time\*baseage10 /RANDOM = INTERCEPT time | COVTYPE(UN) SUBJECT(PersonID). |
| Resources | Processor Time | 00:00:00.06 |
| Elapsed Time | 00:00:00.06 |

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| **Model Dimension**a | | | | | |
|  | | Number of Levels | Covariance Structure | Number of Parameters | Subject Variables |
| Fixed Effects | Intercept | 1 |  | 1 |  |
| time | 1 |  | 1 |  |
| baseage10 | 1 |  | 1 |  |
| time \* baseage10 | 1 |  | 1 |  |
| Random Effects | Intercept + time | 2 | Unstructured | 3 | PersonID |
| Residual | |  |  | 1 |  |
| Total | | 6 |  | 8 |  |
| a. Dependent Variable: dep: Depression Per Occasion. | | | | | |

|  |  |
| --- | --- |
| **Information Criteria**a | |
| -2 Log Likelihood | 3895.21334436 |
| Akaike's Information Criterion (AIC) | 3911.21334436 |
| Hurvich and Tsai's Criterion (AICC) | 3911.39539240 |
| Bozdogan's Criterion (CAIC) | 3956.69023819 |
| Schwarz's Bayesian Criterion (BIC) | 3948.69023819 |
| The information criteria are displayed in smaller-is-better form.a | |
| a. Dependent Variable: dep: Depression Per Occasion. | |

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| --- | --- | --- |
| **Coefficients of Determination** | | |
| Pseudo-R Square Measures | Marginal | .133 |
| Conditional | .665 |

|  |  |  |
| --- | --- | --- |
| **Intraclass Correlation Coefficients** | | |
| Overall ICCs | Adjusted | .614 |
| Conditional | .532 |

**Fixed Effects**

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| **Type III Tests of Fixed Effects**a | | | | |
| Source | Numerator df | Denominator df | F | Sig. |
| Intercept | 1 | 199.904 | 1362.523 | <.001 |
| time | 1 | 198.674 | 180.334 | <.001 |
| baseage10 | 1 | 199.313 | 17.794 | <.001 |
| time \* baseage10 | 1 | 199.386 | 76.393 | <.001 |
| a. Dependent Variable: dep: Depression Per Occasion. | | | | |

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| --- | --- | --- | --- | --- | --- | --- |
| **Estimates of Fixed Effects**a | | | | | | |
| Parameter | Estimate | Std. Error | df | t | Sig. | 95% Confidence Interval |
| Lower Bound |
| Intercept | 8.018 | .217 | 199.904 | 36.912 | <.001 | 7.589 |
| time | 1.050 | .078 | 198.674 | 13.429 | <.001 | .896 |
| baseage10 | -1.400 | .332 | 199.313 | -4.218 | <.001 | -2.055 |
| time \* baseage10 | 1.046 | .120 | 199.386 | 8.740 | <.001 | .810 |

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| --- | --- | --- |
| **Estimates of Fixed Effects**a | | |
| Parameter | 95% Confidence Interval | |
| Upper Bound | |
| Intercept | 8.446 | |
| time | 1.204 | |
| baseage10 | -.746 | |
| time \* baseage10 | 1.283 | |
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| a. Dependent Variable: dep: Depression Per Occasion. |

**Covariance Parameters**

|  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- |
| **Estimates of Covariance Parameters**a | | | | | | |
| Parameter | | Estimate | Std. Error | Wald Z | Sig. | 95% Confidence Interval |
| Lower Bound |
| Residual | | 4.340 | .307 | 14.152 | <.001 | 3.779 |
| Intercept + time [subject = PersonID] | UN (1,1) | 6.177 | .946 | 6.533 | <.001 | 4.576 |
| UN (2,1) | -.143 | .272 | -.528 | .598 | -.676 |
| UN (2,2) | .330 | .134 | 2.462 | .014 | .149 |

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| **Estimates of Covariance Parameters**a | | | |
| Parameter | | 95% Confidence Interval | |
| Upper Bound | |
| Residual | | 4.985 | |
| Intercept + time [subject = PersonID] | UN (1,1) | 8.338 | |
| UN (2,1) | .389 | |
| UN (2,2) | .732 | |
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| a. Dependent Variable: dep: Depression Per Occasion. |

Model 5: Naive Addition of a Time-Varying Predictor

**Mixed Model Analysis**

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| --- | --- | --- |
| **Notes** | | |
| Output Created | | 30-JUL-2025 14:48:32 |
| Comments | |  |
| Input | Active Dataset | Chapter21 |
| Filter | <none> |
| Weight | <none> |
| Split File | <none> |
| N of Rows in Working Data File | 800 |
| Missing Value Handling | Definition of Missing | User-defined missing values are treated as valid data. |
| Cases Used | Statistics are based on all cases with valid data for all variables in the model. |
| Weight Handling | | not applicable |
| Syntax | | MIXED dep BY PersonID WITH time baseage10 game3c /METHOD = ML /CRITERIA = DFMETHOD(SATTERTHWAITE) /PRINT = SOLUTION TESTCOV /FIXED = time baseage10 time\*baseage10 game3c /RANDOM = INTERCEPT time | COVTYPE(UN) SUBJECT(PersonID). |
| Resources | Processor Time | 00:00:00.06 |
| Elapsed Time | 00:00:00.06 |

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| --- | --- | --- | --- | --- | --- |
| **Model Dimension**a | | | | | |
|  | | Number of Levels | Covariance Structure | Number of Parameters | Subject Variables |
| Fixed Effects | Intercept | 1 |  | 1 |  |
| time | 1 |  | 1 |  |
| baseage10 | 1 |  | 1 |  |
| time \* baseage10 | 1 |  | 1 |  |
| game3c | 1 |  | 1 |  |
| Random Effects | Intercept + time | 2 | Unstructured | 3 | PersonID |
| Residual | |  |  | 1 |  |
| Total | | 7 |  | 9 |  |
| a. Dependent Variable: dep: Depression Per Occasion. | | | | | |

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| --- | --- |
| **Information Criteria**a | |
| -2 Log Likelihood | 3661.68996788 |
| Akaike's Information Criterion (AIC) | 3679.68996788 |
| Hurvich and Tsai's Criterion (AICC) | 3679.91781598 |
| Bozdogan's Criterion (CAIC) | 3730.85147343 |
| Schwarz's Bayesian Criterion (BIC) | 3721.85147343 |
| The information criteria are displayed in smaller-is-better form.a | |
| a. Dependent Variable: dep: Depression Per Occasion. | |

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| **Coefficients of Determination** | | |
| Pseudo-R Square Measures | Marginal | .276 |
| Conditional | .821 |

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| --- | --- | --- |
| **Intraclass Correlation Coefficients** | | |
| Overall ICCs | Adjusted | .752 |
| Conditional | .545 |

**Fixed Effects**

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| --- | --- | --- | --- | --- |
| **Type III Tests of Fixed Effects**a | | | | |
| Source | Numerator df | Denominator df | F | Sig. |
| Intercept | 1 | 195.432 | 1294.058 | <.001 |
| time | 1 | 200.505 | 239.126 | <.001 |
| baseage10 | 1 | 195.628 | 11.613 | <.001 |
| time \* baseage10 | 1 | 200.850 | 110.287 | <.001 |
| game3c | 1 | 684.593 | 301.142 | <.001 |
| a. Dependent Variable: dep: Depression Per Occasion. | | | | |

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| --- | --- | --- | --- | --- | --- | --- |
| **Estimates of Fixed Effects**a | | | | | | |
| Parameter | Estimate | Std. Error | df | t | Sig. | 95% Confidence Interval |
| Lower Bound |
| Intercept | 7.981 | .222 | 195.432 | 35.973 | <.001 | 7.543 |
| time | 1.011 | .065 | 200.505 | 15.464 | <.001 | .882 |
| baseage10 | -1.157 | .339 | 195.628 | -3.408 | <.001 | -1.826 |
| time \* baseage10 | 1.051 | .100 | 200.850 | 10.502 | <.001 | .853 |
| game3c | 1.156 | .067 | 684.593 | 17.353 | <.001 | 1.025 |

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| --- | --- | --- |
| **Estimates of Fixed Effects**a | | |
| Parameter | 95% Confidence Interval | |
| Upper Bound | |
| Intercept | 8.418 | |
| time | 1.140 | |
| baseage10 | -.487 | |
| time \* baseage10 | 1.248 | |
| game3c | 1.287 | |
|  |  |  | |  |  |  |  |

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| a. Dependent Variable: dep: Depression Per Occasion. |

**Covariance Parameters**

|  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- |
| **Estimates of Covariance Parameters**a | | | | | | |
| Parameter | | Estimate | Std. Error | Wald Z | Sig. | 95% Confidence Interval |
| Lower Bound |
| Residual | | 2.719 | .192 | 14.163 | <.001 | 2.368 |
| Intercept + time [subject = PersonID] | UN (1,1) | 7.706 | .982 | 7.845 | <.001 | 6.003 |
| UN (2,1) | -.155 | .219 | -.710 | .478 | -.585 |
| UN (2,2) | .293 | .091 | 3.214 | .001 | .159 |

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| --- | --- | --- | --- |
| **Estimates of Covariance Parameters**a | | | |
| Parameter | | 95% Confidence Interval | |
| Upper Bound | |
| Residual | | 3.123 | |
| Intercept + time [subject = PersonID] | UN (1,1) | 9.894 | |
| UN (2,1) | .274 | |
| UN (2,2) | .538 | |
|  |  |  |  | |  |  |  |

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| a. Dependent Variable: dep: Depression Per Occasion. |

Empty Means, Random Intercept to Get ICC for Gaming Predictor

**Mixed Model Analysis**

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| --- | --- | --- |
| **Notes** | | |
| Output Created | | 30-JUL-2025 14:48:49 |
| Comments | |  |
| Input | Active Dataset | Chapter21 |
| Filter | <none> |
| Weight | <none> |
| Split File | <none> |
| N of Rows in Working Data File | 800 |
| Missing Value Handling | Definition of Missing | User-defined missing values are treated as valid data. |
| Cases Used | Statistics are based on all cases with valid data for all variables in the model. |
| Weight Handling | | not applicable |
| Syntax | | MIXED game BY PersonID /METHOD = ML /CRITERIA = DFMETHOD(SATTERTHWAITE) /PRINT = SOLUTION TESTCOV /FIXED = /RANDOM = INTERCEPT | COVTYPE(VC) SUBJECT(PersonID). |
| Resources | Processor Time | 00:00:00.03 |
| Elapsed Time | 00:00:00.03 |

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| --- |
| **Warnings** |
| A(n) FIXED subcommand has no specifications and will therefore be ignored. |

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| --- | --- | --- | --- | --- | --- |
| **Model Dimension**a | | | | | |
|  | | Number of Levels | Covariance Structure | Number of Parameters | Subject Variables |
| Fixed Effects | Intercept | 1 |  | 1 |  |
| Random Effects | Intercept | 1 | Variance Components | 1 | PersonID |
| Residual | |  |  | 1 |  |
| Total | | 2 |  | 3 |  |
| a. Dependent Variable: game: Hours Daily Gaming Per Occasion. | | | | | |

|  |  |
| --- | --- |
| **Information Criteria**a | |
| -2 Log Likelihood | 2574.16688153 |
| Akaike's Information Criterion (AIC) | 2580.16688153 |
| Hurvich and Tsai's Criterion (AICC) | 2580.19703229 |
| Bozdogan's Criterion (CAIC) | 2597.22071672 |
| Schwarz's Bayesian Criterion (BIC) | 2594.22071672 |
| The information criteria are displayed in smaller-is-better form.a | |
| a. Dependent Variable: game: Hours Daily Gaming Per Occasion. | |

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| --- | --- | --- |
| **Coefficients of Determination** | | |
| Pseudo-R Square Measures | Marginal | .000 |
| Conditional | .465 |

|  |  |  |
| --- | --- | --- |
| **Intraclass Correlation Coefficients** | | |
| Overall ICCs | Adjusted | .465 |
| Conditional | .465 |

**Fixed Effects**

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| **Type III Tests of Fixed Effects**a | | | | |
| Source | Numerator df | Denominator df | F | Sig. |
| Intercept | 1 | 200 | 1714.221 | <.001 |
| a. Dependent Variable: game: Hours Daily Gaming Per Occasion. | | | | |

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| --- | --- | --- | --- | --- | --- | --- | --- |
| **Estimates of Fixed Effects**a | | | | | | | |
| Parameter | Estimate | Std. Error | df | t | Sig. | 95% Confidence Interval | |
| Lower Bound | Upper Bound |
| Intercept | 3.104 | .075 | 200 | 41.403 | <.001 | 2.956 | 3.252 |
| a. Dependent Variable: game: Hours Daily Gaming Per Occasion. | | | | | | | |

**Covariance Parameters**

|  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- |
| **Estimates of Covariance Parameters**a | | | | | | |
| Parameter | | Estimate | Std. Error | Wald Z | Sig. | 95% Confidence Interval |
| Lower Bound |
| Residual | | 1.005 | .058 | 17.321 | <.001 | .898 |
| Intercept [subject = PersonID] | Variance | .873 | .113 | 7.700 | <.001 | .676 |

|  |  |  |  |
| --- | --- | --- | --- |
| **Estimates of Covariance Parameters**a | | | |
| Parameter | | 95% Confidence Interval | |
| Upper Bound | |
| Residual | | 1.126 | |
| Intercept [subject = PersonID] | Variance | 1.126 | |
|  |  |  |  | |  |  |  |

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| a. Dependent Variable: game: Hours Daily Gaming Per Occasion. |

Model 6: Addition of a Person-Mean-Centered Time-Varying Predictor

**Mixed Model Analysis**

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| --- | --- | --- |
| **Notes** | | |
| Output Created | | 30-JUL-2025 14:49:00 |
| Comments | |  |
| Input | Active Dataset | Chapter21 |
| Filter | <none> |
| Weight | <none> |
| Split File | <none> |
| N of Rows in Working Data File | 800 |
| Missing Value Handling | Definition of Missing | User-defined missing values are treated as valid data. |
| Cases Used | Statistics are based on all cases with valid data for all variables in the model. |
| Weight Handling | | not applicable |
| Syntax | | MIXED dep BY PersonID WITH time baseage10 Wpgame PMgame3c /METHOD = ML /CRITERIA = DFMETHOD(SATTERTHWAITE) /PRINT = SOLUTION TESTCOV /FIXED = time baseage10 time\*baseage10 WPgame PMgame3c time\*PMgame3c /RANDOM = INTERCEPT time | COVTYPE(UN) SUBJECT(PersonID). |
| Resources | Processor Time | 00:00:00.06 |
| Elapsed Time | 00:00:00.06 |

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| **Model Dimension**a | | | | | |
|  | | Number of Levels | Covariance Structure | Number of Parameters | Subject Variables |
| Fixed Effects | Intercept | 1 |  | 1 |  |
| time | 1 |  | 1 |  |
| baseage10 | 1 |  | 1 |  |
| time \* baseage10 | 1 |  | 1 |  |
| WPgame | 1 |  | 1 |  |
| PMgame3c | 1 |  | 1 |  |
| time \* PMgame3c | 1 |  | 1 |  |
| Random Effects | Intercept + time | 2 | Unstructured | 3 | PersonID |
| Residual | |  |  | 1 |  |
| Total | | 9 |  | 11 |  |
| a. Dependent Variable: dep: Depression Per Occasion. | | | | | |

|  |  |
| --- | --- |
| **Information Criteria**a | |
| -2 Log Likelihood | 3631.98042565 |
| Akaike's Information Criterion (AIC) | 3653.98042565 |
| Hurvich and Tsai's Criterion (AICC) | 3654.31545103 |
| Bozdogan's Criterion (CAIC) | 3716.51115466 |
| Schwarz's Bayesian Criterion (BIC) | 3705.51115466 |
| The information criteria are displayed in smaller-is-better form.a | |
| a. Dependent Variable: dep: Depression Per Occasion. | |

|  |  |  |
| --- | --- | --- |
| **Coefficients of Determination** | | |
| Pseudo-R Square Measures | Marginal | .232 |
| Conditional | .790 |

|  |  |  |
| --- | --- | --- |
| **Intraclass Correlation Coefficients** | | |
| Overall ICCs | Adjusted | .727 |
| Conditional | .558 |

**Fixed Effects**

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| **Type III Tests of Fixed Effects**a | | | | |
| Source | Numerator df | Denominator df | F | Sig. |
| Intercept | 1 | 200.050 | 1484.415 | <.001 |
| time | 1 | 199.095 | 238.254 | <.001 |
| baseage10 | 1 | 199.622 | 18.178 | <.001 |
| time \* baseage10 | 1 | 200.035 | 110.547 | <.001 |
| WPgame | 1 | 564.241 | 329.947 | <.001 |
| PMgame3c | 1 | 199.492 | .695 | .405 |
| time \* PMgame3c | 1 | 200.454 | .065 | .799 |
| a. Dependent Variable: dep: Depression Per Occasion. | | | | |

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| --- | --- | --- | --- | --- | --- | --- |
| **Estimates of Fixed Effects**a | | | | | | |
| Parameter | Estimate | Std. Error | df | t | Sig. | 95% Confidence Interval |
| Lower Bound |
| Intercept | 8.068 | .209 | 200.050 | 38.528 | <.001 | 7.655 |
| time | 1.006 | .065 | 199.095 | 15.435 | <.001 | .877 |
| baseage10 | -1.373 | .322 | 199.622 | -4.264 | <.001 | -2.007 |
| time \* baseage10 | 1.055 | .100 | 200.035 | 10.514 | <.001 | .857 |
| WPgame | 1.283 | .071 | 564.241 | 18.164 | <.001 | 1.145 |
| PMgame3c | .164 | .196 | 199.492 | .834 | .405 | -.223 |
| time \* PMgame3c | .016 | .061 | 200.454 | .255 | .799 | -.105 |

|  |  |  |
| --- | --- | --- |
| **Estimates of Fixed Effects**a | | |
| Parameter | 95% Confidence Interval | |
| Upper Bound | |
| Intercept | 8.481 | |
| time | 1.134 | |
| baseage10 | -.738 | |
| time \* baseage10 | 1.253 | |
| WPgame | 1.422 | |
| PMgame3c | .550 | |
| time \* PMgame3c | .136 | |
|  |  |  | |  |  |  |  |

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| --- |
| a. Dependent Variable: dep: Depression Per Occasion. |

**Covariance Parameters**

|  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- |
| **Estimates of Covariance Parameters**a | | | | | | |
| Parameter | | Estimate | Std. Error | Wald Z | Sig. | 95% Confidence Interval |
| Lower Bound |
| Residual | | 2.714 | .192 | 14.150 | <.001 | 2.363 |
| Intercept + time [subject = PersonID] | UN (1,1) | 6.611 | .861 | 7.676 | <.001 | 5.121 |
| UN (2,1) | -.128 | .207 | -.620 | .535 | -.534 |
| UN (2,2) | .283 | .091 | 3.115 | .002 | .151 |

|  |  |  |  |
| --- | --- | --- | --- |
| **Estimates of Covariance Parameters**a | | | |
| Parameter | | 95% Confidence Interval | |
| Upper Bound | |
| Residual | | 3.118 | |
| Intercept + time [subject = PersonID] | UN (1,1) | 8.534 | |
| UN (2,1) | .277 | |
| UN (2,2) | .531 | |
|  |  |  |  | |  |  |  |

|  |
| --- |
| a. Dependent Variable: dep: Depression Per Occasion. |