Chapter 10

**Repeated measures two-way ANOVA**

Students’ levels of anxiety were measured based on two sources, examinations and social interaction. Both factors were measured pre- and post-activity. Each measurement used a scale of 1 to 10, 1 being the lowest and 10 being the highest. One of the factors is the source of anxiety; the other is time before and after the activity.

Perform a repeated measures two-way ANOVA in JASP to analyze the individual and interaction effects of activity and time on the students’ anxiety levels (on the Repeated-measures two-way ANOVA csv file).

|  |  |  |  |
| --- | --- | --- | --- |
| PreExam\_Anxiety | PostExam\_Anxiety | PreSocial\_Anxiety | PostSocial\_Anxiety |
| 6 | 5 | 9 | 7 |
| 9 | 6 | 6 | 4 |
| 5 | 3 | 8 | 5 |
| 6 | 2 | 5 | 5 |
| 6 | 5 | 9 | 6 |
| 3 | 3 | 7 | 5 |
| 9 | 6 | 7 | 5 |
| 4 | 2 | 4 | 3 |
| 8 | 5 | 6 | 5 |
| 7 | 2 | 8 | 4 |

**Between-Subjects ANOVA**

Rowing exercises are being used to improve fitness. Each student has rowed for a 5 minute period. Four different rowing machines are chosen, and the teacher was also noted. The results are as follows (in the Between Subjects ANOVA csv file):

|  |  |  |
| --- | --- | --- |
| Strokes | Machine | Teacher |
| 109 | 1 | 1 |
| 110 | 1 | 1 |
| 110 | 1 | 2 |
| 112 | 1 | 2 |
| 116 | 1 | 3 |
| 114 | 1 | 3 |
| 110 | 2 | 1 |
| 115 | 2 | 1 |
| 110 | 2 | 2 |
| 111 | 2 | 2 |
| 112 | 2 | 3 |
| 115 | 2 | 3 |
| 108 | 3 | 1 |
| 109 | 3 | 1 |
| 111 | 3 | 2 |
| 109 | 3 | 2 |
| 114 | 3 | 3 |
| 119 | 3 | 3 |
| 110 | 4 | 1 |
| 108 | 4 | 1 |
| 114 | 4 | 2 |
| 112 | 4 | 2 |
| 120 | 4 | 3 |
| 117 | 4 | 3 |

Test to see if there is a difference the average number of strokes according to the factors considered.

**Mixed ANOVA**

In this (completely imaginary) study, we want to see differences in fitness levels, dependent on the stage of teaching (Stage 1 is at the beginning; Stage 2 is intermediate stage; Stage 3 is towards the end of the semester), and the type of exercise machine. Below are the results (also on the Mixed ANOVA.csv file):

|  |  |  |  |
| --- | --- | --- | --- |
| Patient | Stage | StairClimb | Rowing |
| 1 | 1 | 23 | 24 |
| 2 | 1 | 24 | 23 |
| 3 | 1 | 25 | 28 |
| 4 | 2 | 30 | 38 |
| 5 | 2 | 28 | 36 |
| 6 | 2 | 26 | 35 |
| 7 | 3 | 31 | 34 |
| 8 | 3 | 32 | 36 |
| 9 | 3 | 29 | 39 |

Conduct a mixed ANOVA with JASP and identify which factors are associated with clinical outcomes.