|  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- |
|  | Day 1 |  |  | Day 2 |  |  |  |
|  | Male | Female |  |  | Male | Female |  |
| Caffeine | 100 | 200 |  | Caffeine | 75 | 150 |  |
| Sugar | 75 | 150 |  | Sugar | 50 | 100 |  |
|  |  |  |  |  |  |  |  |

In this study, we test male and female rats in a running wheel. They are tested for 2 days. Half of the rats are given water with caffeine in it, and the other half are given water with sugar in it. We measure how many revolutions they have in the running wheel.

What is the shorthand notation for this design? 2 x 2 x 2

What are the IVs and levels. Sex (male, female) x Treatment (caffeine, sugar) x Day (1, 2)

What is the DV? Running wheel rotations

What kind of factorial design is it? Mixed Factorial. Sex and Treatment are between-subjects factors and Day is a within-subjects factor.

Graph these results.

Rotations is on the y-axis, maybe in increments of 25. Put Sex on the x-axis and then use lines to designate Caffeine and Sugar. I used an open circle/broken line for sugar and a solid circle/line for caffeine.

Are there likely any main effects?

Yes, there should be main effects for all three variables.

Are there likely any interactions?

Yes, there should be a 3-way interaction. There are also likely interactions for day x sex, day x treatment, and treatment x sex. This would depend on how much variability there is though.

If you were describing the results of this study, how would you describe them? Females run more revolutions than males, caffeine results in more revolutions than sugar, and there are more revolutions on day 1 than on day 2. To try to explain the interaction effects, there is more of a difference between caffeine and sugar in females than there is between caffeine and sugar in males.