Report

Jonathan Wai

Description

Being a student at University of Toronto made me realize how much I study compared to my friends from other universities. Recently my friend suggested that I only study so much because I am doing it ineffectively. This made me question if my poor study routine is the reason why I spend so much time to memorize/learn the material.

Interest In particular, I am interested in knowing weather or not my learning outcome is affected by my daily habits of smoking, meditating and eating. I know that eating is a weird variable to choose, however I chose it because a study done at Yale clams that mice's take on information more quickly and retain it better. This was due to the stimulation of hunger. I wish to test if the same applies to me within this study.

Factorial Design I decided to do a 2 by 3 factorial design. I decide to replicate the eight data points so I can estimate the variances. However, I don't want to do too many trails as I fear that with increased practice in memorizing linguistic elements, my own memorization skills of linguistic elements may increase as the experiment progresses.

Variables in my Factorial Design For this experiment, I will follow my setup of routines prior to studying. This includes, smoking / not smoking and meditating for 15 minutes/ not meditating and eating at least once, 8 hours prior to studying/ not eating for 8 hours prior to studying. For example, in setup number 7 I would smoke, not eating 8 hours prior to studying and meditate before studying for 15 minutes. After studying for 20 minutes I will test myself on how many linguistic elements I can memorize given the gloss.

Randomizing material and experiment My linguistic gloss and elements will be taken from my textbook in LIN203 and the internet. The 320 gloss and elements will be written on to a piece of paper, front and back and put into a hat. Before studying I will pull 20 words out of the hat to study and then test if I can memorize them afterwards.

I will also randomize my experiment by putting numbers 1-16 into a bag and picking out one number to determine weather I was going to smoke, meditate or exercise.

Possible Criticisms I might be biased myself to have the experiment to come out the way I want. I could have done this by getting 16 participants to do each setup, that could be a possibility of eliminating the bias of me wanting the right results. A second criticism I expect is that my order of meditating, exercising and smoking before studying matters. I don't know any way around this or weather it would make my factorial design invalid.

Analysis

1) Cube Plot

Cube plot for investigation

modeled = TRUE
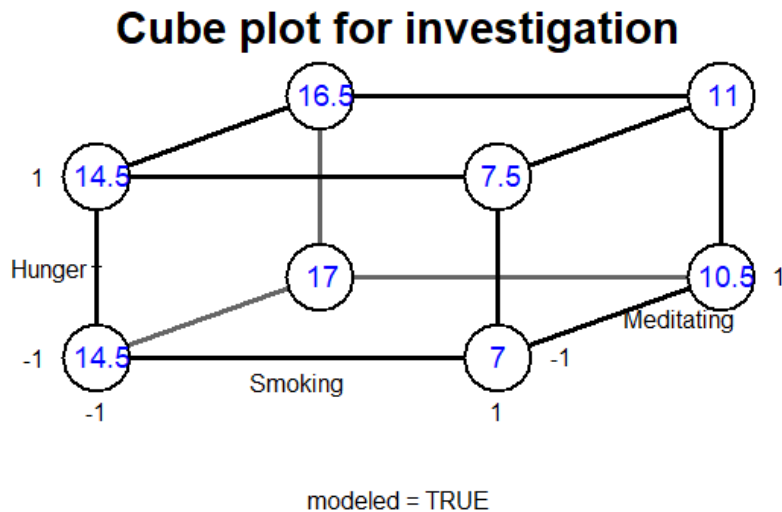
2) Standard Errors:

	Estimate	Std. Error	t value	Pr(>|t|)
(Intercept)	12.3125	0.3366	36.5820	0.0000
Smoking	-3.3125	0.3366	-9.8419	0.0000
Hunger	0.0625	0.3366	0.1857	0.8573
Meditating	1.4375	0.3366	4.2710	0.0027
Smoking:Hunger	0.1875	0.3366	0.5571	0.5927
Smoking:Meditating	0.3125	0.3366	0.9285	0.3803
Hunger:Meditating	-0.0625	0.3366	-0.1857	0.8573
Smoking:Hunger:Meditating	0.0625	0.3366	0.1857	0.8573

3) Main effects and Interaction effects

(Intercept)	Smoking
24.62	-6.62
Meditating	Hunger
2.88	0.12
Smoking:Meditating	Smoking:Hunger
0.62	0.37
Meditating:Hunger	Smoking:Meditating:Hunger
-0.12	0.12

Main effect for -6.62 is an effect that is significant because p value is less than 0.05. Main effect of Meditating is 2.88 with a small p value, meaning that I retain information better if I meditate prior to studying. Interaction Effect Interaction between and Hunger is 0.12. All the interaction effects cannot be accepted because p value is too large, meaning that these could be due to chance that I did better or worse. Factorial estimate for is -6.62 and the standard error of the

factorial estimates are 2 x 0.3366 = 0.6732. Confidence intervals for factorial estimates are below, in sec 4.

4) Confidence Intervals

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                                 2.5 %      97.5 %
(Intercept)                  23.0727235  26.177277
Smoking                      -8.1772765  -5.072723
Meditating                    1.3227235   4.427277
Hunger                       -1.4272765   1.677277
Smoking:Meditating           -0.9272765   2.177277
Smoking:Hunger               -1.1772765   1.927277
Meditating:Hunger            -1.6772765   1.427277
Smoking:Meditating:Hunger    -1.4272765   1.677277
```

95% Confidence interval for the main effect of is (-8.17, -5.07). 95% confidence interval for the main effect of Meditating is (1.32,4.42), and the two-way interaction between Meditating and Hunger has a 95% confidence interval (-1.67,1.42). However, the p value does not support this conclusion.

5) Interaction Plots
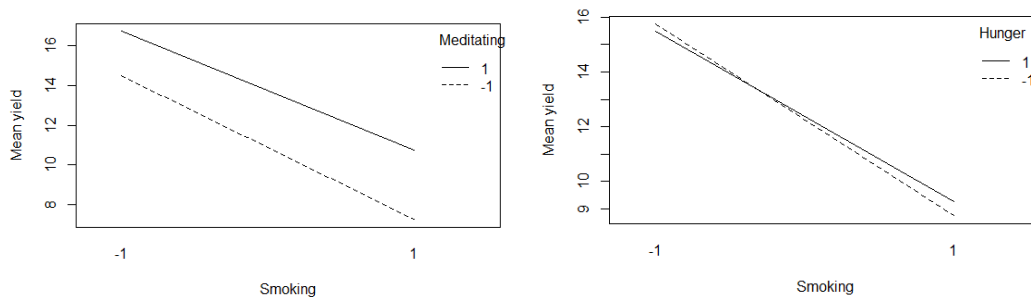
My interaction plots show that there is no indication of interaction between smoking and Meditating because they are parallel. Furthermore, my p values for the hypothesis testing is large, which would not support the conclusion of an interaction between the two variables. My interaction plots show that there is an indication of interaction between smoking and Hunger. However, my p values for the hypothesis testing is large, which would not support the conclusion of an interaction between the two variables.

6) Half Normal Plots

Normal plot of effects from study
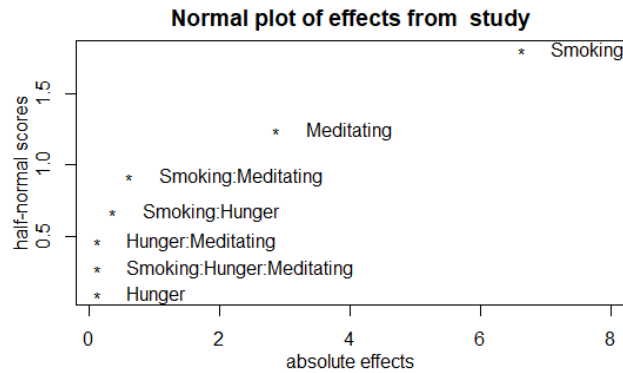
Conclusion

Not smoking before I study can increase my ability to memorize school material. Meditating before I study also helps with my ability to memorize school material. The differences between smoking and not smoking are not due to chance. Furthermore, I cannot conclude that there is an interaction between all my variables I studied because p value is too large. Would fail to reject my null hypothesis. Only effects that seem to be supported by my data fully is smoking and Meditating. Main effect of Hunger is 0.12, meaning that it is possible that I do study better if I eat before I study and do tests. This is not what I expected as the study from Yale states that subjects take on information more quickly and retain it better from the stimulation of hunger. However, p value is larger than 0.05, therefore I cannot conclude with much certainty that Hunger does have an impact on my ability to memorize elements. In the future, I plan on not smoking until I am done studying. In addition I plan on meditating more since this seems to increase my ability to memorize information. In terms of dieting, I will just continue to eat whenever I want because it does not seem to have an impact on my ability to memorize material one way or another.