Possible Implications of CBD Oil

Cohort A: Group2

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Agenda

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- Initial Interest
- Experiment Design

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- Data analysis
- Effect treatment

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- Limitation
- Summary

01

INITIAL INTEREST & EXPERIMENT DESIGN

Our Initial Interest

What Is CBD?

- CBD, is a chemical that is often derived from Hemp plants.
- It is becoming extremely popular and can be found all over the place now
- There are tons of beneficial anecdotal claims to CBD but that is not our focus
- CBD became federally legal all across the country in 2018

Our Question:

- We do know its a non-psychoactive and non-intoxicating chemical
- But does it impair us cognitively
  - Should we put more legislation in place, more restrictions, ban driving, etc
- Does CBD cause cognitive impairment in people that use it?

Why CBD?

- We are interested for many reasons like the growing popularity
- But the most important was the lack of scientific research outside of whether it was harmful or not
- We could and wanted to help contribute to an area that lacks a lot of research

Experiment Design

Precondition

- Put participants in random group
- Reaction time test
- Taking the tests twice （make comparasion)
- Wait time-2 minutes
- Hold under tongue-1 minute

Treatment & Placebo

- CBD oil - Treatment
  Coconut oil - Placebo
  CBD- Cannabidiol
- Carrier oil(coconut oil)
- The confirmation form

02

DATA ANALYSIS & TREATMENT EFFECT

Data Collected

Observation:
44 Individuals

Variables

- Gender
- Age
- The diff between the action before and after the treatment

Data Types

- Dummy
- Numeric

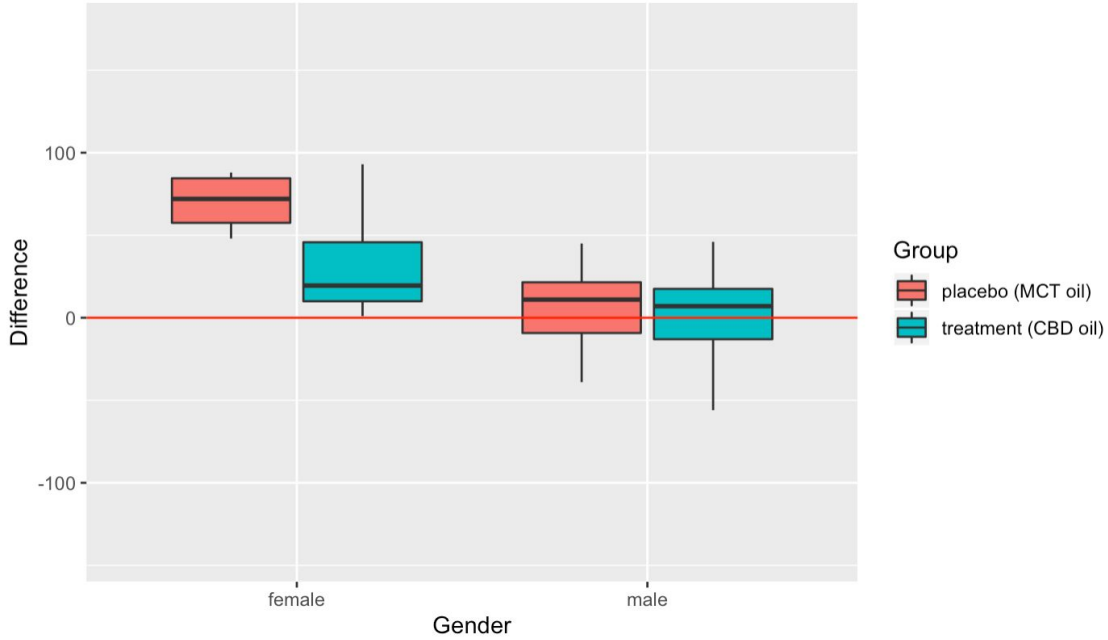
Data Collected

Tested 44 individuals in total: 15 of them are female, and 29 of them are male.
The age range of the observations are 21 to 33.
Among these observations, we randomly select them into treatment group (23 observations) or placebo group(21 observations).

7 columns in the dataset:
The columns not only contained some variables about individuals' name,unique ID, gender, age but it also have records variables -- the reaction time before and after the treatment/placebo.

Data Visualization

Figure2: The difference in reaction time based on gender



Conclusion:

1. Female are more easily affected by the CBD oil.

2. Maybe the CBD oil makes people calm down and react slowly because treatment group (CBD oil) has less difference than placebo (MCT oil).

- Participants in each group took two reaction tests.
- Difference = reaction time before treatment - reaction time after treatment

Treatment Effects

Fixed Regression Result

	Dependent variable:			
	diff			
	(1)	(2)	(3)	(4)
treatment	-6.085	13.504	-6.631	9.207
	(16.462)	(18.085)	(15.699)	(17.984)
Constant	22.476*			
	(11.902)			
Observations	44	44	44	44
R2	0.003	0.231	0.115	0.281
Adjusted R2	-0.020	-0.002	0.072	0.034
Residual Std. Error	54.540 (df = 42)	54.057 (df = 33)	52.007 (df = 41)	53.065 (df = 32)
Note:				*p<0.1; **p<0.05; ***p<0.01

(1). Difference = $\alpha 0 + \alpha 1 * \text{Treatment}$

(2). Difference = $\beta 0 + \beta 1 * \text{Treatment} + \text{AgeFixedEffect}$

(3). Difference = $\gamma 0 + \gamma 1 * \text{Treatment} + \text{GenderFixedEffect}$

(4). Difference = $\delta 0 + \delta 1 * \text{Treatment} + \text{AgeFixedEffect} + \text{GenderFixedEffect}$

Treatment Effects

Interaction Regression Result

	Dependent variable:	
	diff	
	(1)	(2)
treatment	1.382	-31.165
	(30.049)	(135.375)
gender	-36.438	
	(28.420)	
treatment:gender	12.148	
	(37.072)	
age		0.870
		(3.179)
treatment:age		1.058
		(5.652)
Observations	44	44
R2	0.284	0.121
Adjusted R2	0.006	0.030
Residual Std. Error	53.821 (df = 31)	53.161 (df = 39)
Note:	*p<0.1; **p<0.05; ***p<0.01	

```
treat_n_gender = felm(diff ~
treatment * gender | age, data =
cbd1)

treat_n_age = felm(diff ~
treatment * age | gender, data =
cbd1)
```

03

LIMITATION & SUMMARY

5 Main Limitation

- Sample size is small
  - Only 44 experimentees
- The experiment is not double blind
  - Some people saw what treatment they got or deduced it
- Lack of excludability
  - Part of the treatment group are affected by the placebo group, due to us releasing which they took for concern
- Age Limitation
  - Most of the people are from 21-25. Not much diversity in age.
- Warm-up exercises may not enough
  - People have different proficiency on the reflection game

Summary

- We can not reject our null hypothesis: There is no difference between someone who has taken and CBD and someone who has not.
- The results were not significant.
- Improvements for future experiment:
  - Reserve two rooms for experimentees
    - Double blind experimentees
    - Make sure that it has excludability
    - Create the placebo and treatment in another room
  - Increase the sample size
  - Gather people to do the experiment in same time
  - Setting warm-up exercises enough to avoid bias


THANK YOU!
Q&A