

## Project Proposal

### **1. What is the problem you want to solve?**

- Determine the relationship between BMI and executive function (EF).
- Determine which other factors are predictive of low EF scores.

### **2. Who is your client and why do they care about this problem? What will your client do or decide based on this analysis that they wouldn't have done otherwise?**

- **Client:** State/local government of Selangor.

- **Why do they care about this problem?**

Executive function is a cluster of cognitive processes that underlie planning, organizing, and regulation. It is responsible for the achievement of purposeful, goal-directed behaviors.

The EF consists of three domains: inhibition (ability to resist distraction and maintain focus); working memory (ability to store, maintain, and manipulate information over a brief period of time); cognitive flexibility (ability to shift attention, select information, and alter response strategies in response to changing task demands).

Proper EF is important for healthy and balanced adulthood, allowing an individual to be a productive member of society, while meeting the demands of a demanding workforce successfully.

- **What will your client do or decide based on this analysis?**

Adolescence is when the prefrontal cortex is developing and is the prime time to adopt healthy habits which will be maintained in adulthood. As such, the state or local government can decide to regulate factors that are controllable like amount of physical activity, etc. through school reform.

### 3. What data are you using? How will you acquire the data?

[https://figshare.com/articles/Obesity\\_and\\_unhealthy\\_lifestyle\\_associated\\_with\\_poor\\_executive\\_function\\_among\\_Malaysian\\_adolescents/6150290](https://figshare.com/articles/Obesity_and_unhealthy_lifestyle_associated_with_poor_executive_function_among_Malaysian_adolescents/6150290)

#### Dataset Notes

1. 513 students from two separate high schools in Selangor, Malaysia.
2. Ages (12 – 16)
3. Sex (1 – male; 2 – female)
4. Weight (kg)
5. Height (m)
6. BMI
7. BMI for Age?
8. Physical Fitness Score
  - a. Harvard Step Test (modified): used to assess aerobic fitness.
9. PFS\_CAT (1 – 5: POOR – EXCELLENT)
10. Breakfast; Lunch; Dinner
11. PA\_Total\_Score
12. PA\_CAT
13. Average Hours of Sleep on Weekdays
14. Average Hours of Sleep on Weekends
15. Sleep Percent
16. Global\_Sleep\_CAT (0 – 1)
17. Household Size
18. Income Category (1 – 3)
19. Father's Level of Education (1 – 3)
20. Mother's Level of Education (1 – 3)
21. Interference/Inhibition Score (Stroop Color-Word Test)
22. Working Memory Total (Digit Span Test)
23. Cognitive Flexibility Total (Trail-Making Test)

### 4. Briefly outline how you'll solve this problem.

- Graph all factors vs. EF score.
- Graph obesity vs. EF scores.

## **5. What are your deliverables?**

Paper + Jupyter Notebook