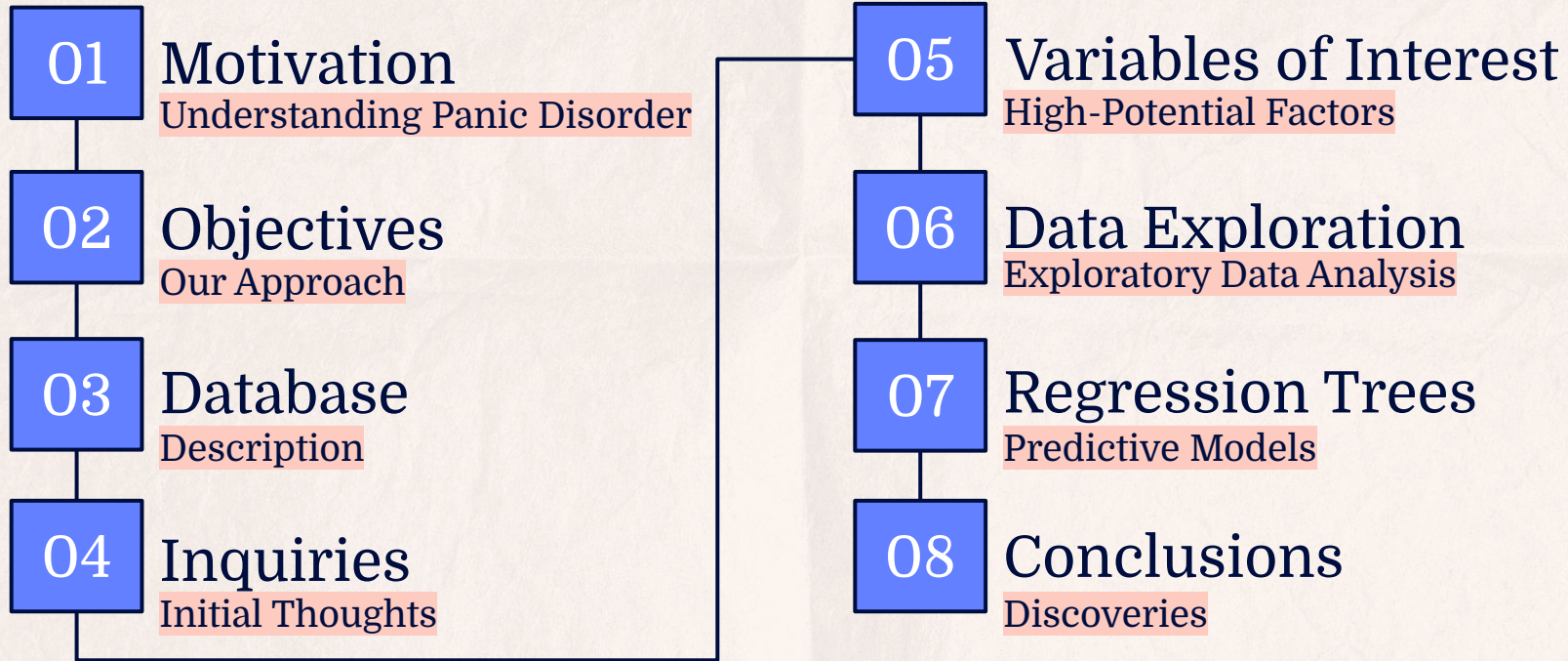# Don't Panic
It's only data!
Panic Attack Data Analysis

by Haley Bohn, Mia Parker, and Jennifer Arreola

Step-by-Step
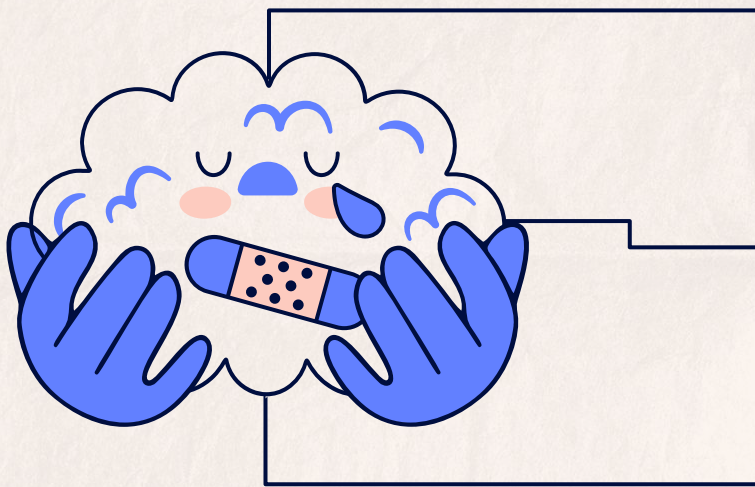
Presentation Overview

Motivation

Understanding Panic Disorder

Definition

Panic disorder is an **anxiety disorder** characterized by **unexpected and repeated** episodes of **intense fear** accompanied by **physical symptoms**.[1]

Statistics

Panic Disorder

➢ ~**4.7 %** U.S. Adults (18+)[1]

Anxiety Disorder

➢ ~**11.9 %** U.S. College Students[2]

Impacts

Daily life **functioning**— including **work performance**, **household maintenance**, **social interactions**, and **intimate relationships**— is often disrupted.[1]

[1] Panic disorder. (n.d.). National Institute of Mental Health (NIMH).
[2] Pedrelli, P., Nyer, M., Yeung, A., Zulauf, C., & Wilens, T. (2014).

Objectives

Our Approach

- ❏ **Identify** key factors that contribute to anxiety and panic attacks.

- ❏ **Explore** lifestyle choices and pre-existing conditions.

- ❏ **Analyze** predictive behaviors.

Panic Attack Database

Description

Data Description

1,200+ Observations

Ages: 18-64
Gender Distribution: **F~45% / M~44% / NB~11%**

34 Columns

Target Variables:
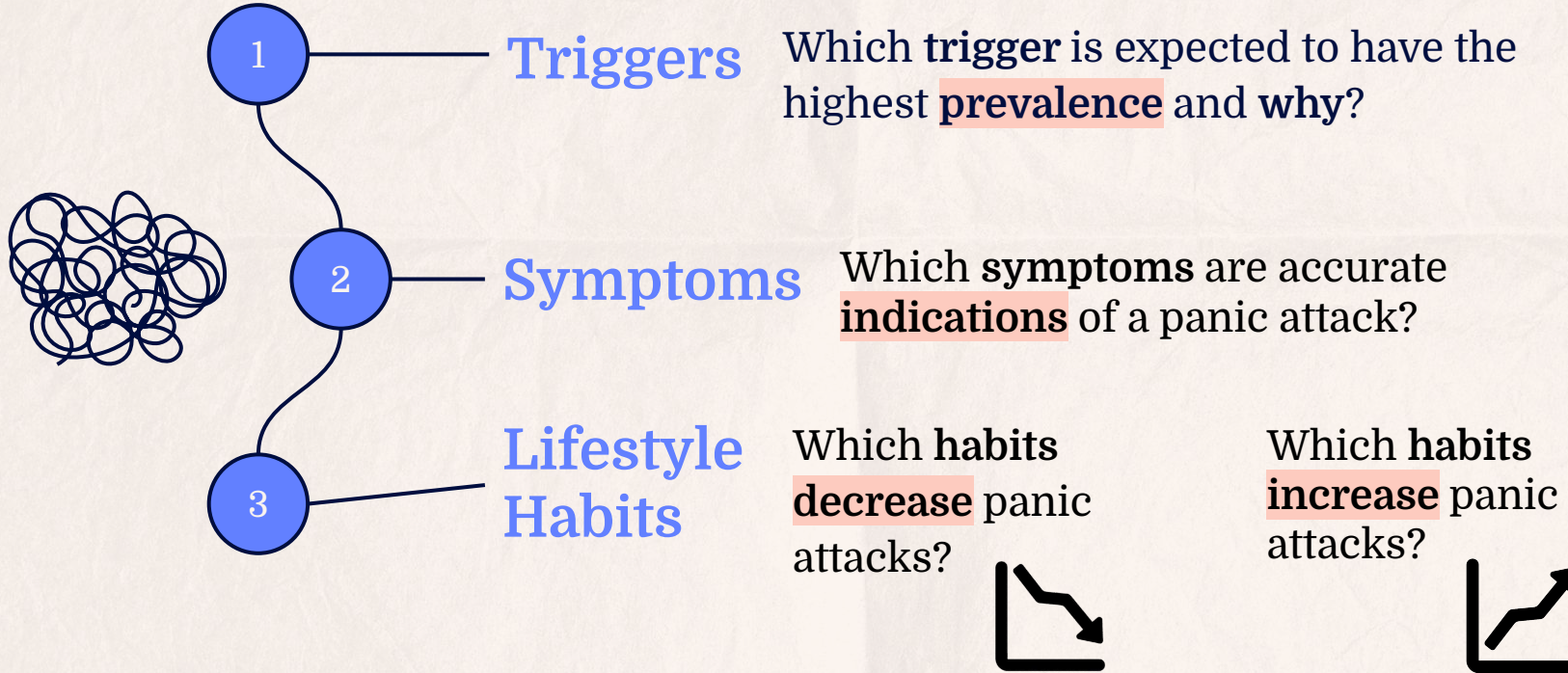Panic Attack **Frequency** and **Severity**

Source

Panic Attacks ML Ready Dataset
kaggle

Inquiries

Initial Thoughts

1 — **Triggers** — Which **trigger** is expected to have the highest **prevalence** and **why**?

2 — **Symptoms** — Which **symptoms** are accurate **indications** of a panic attack?

3 — **Lifestyle Habits** — Which **habits** **decrease** panic attacks?

Which **habits** **increase** panic attacks?

Variables of Interest

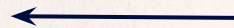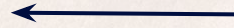## High-Potential Factors

Severity Variables

Frequency:
How often are panic attacks experienced?

Duration:
How long did the panic attack last?

Triggers

Caffeine, **PTSD**, Phobia, **Social-Anxiety**, Stress, & Unknown.

Symptoms

Sweating, **Shortness of Breath**, Dizziness, Chest Pain, & Trembling.

Lifestyle Habits

Medication, **Caffeine Intake**, Exercise Frequency, **Sleep Hours**, Alcohol Consumption, **Smoking** & Therapy.

Triggers

The frequency of **triggers** appears **evenly distributed** across panic attack **severity**.

Prevalence

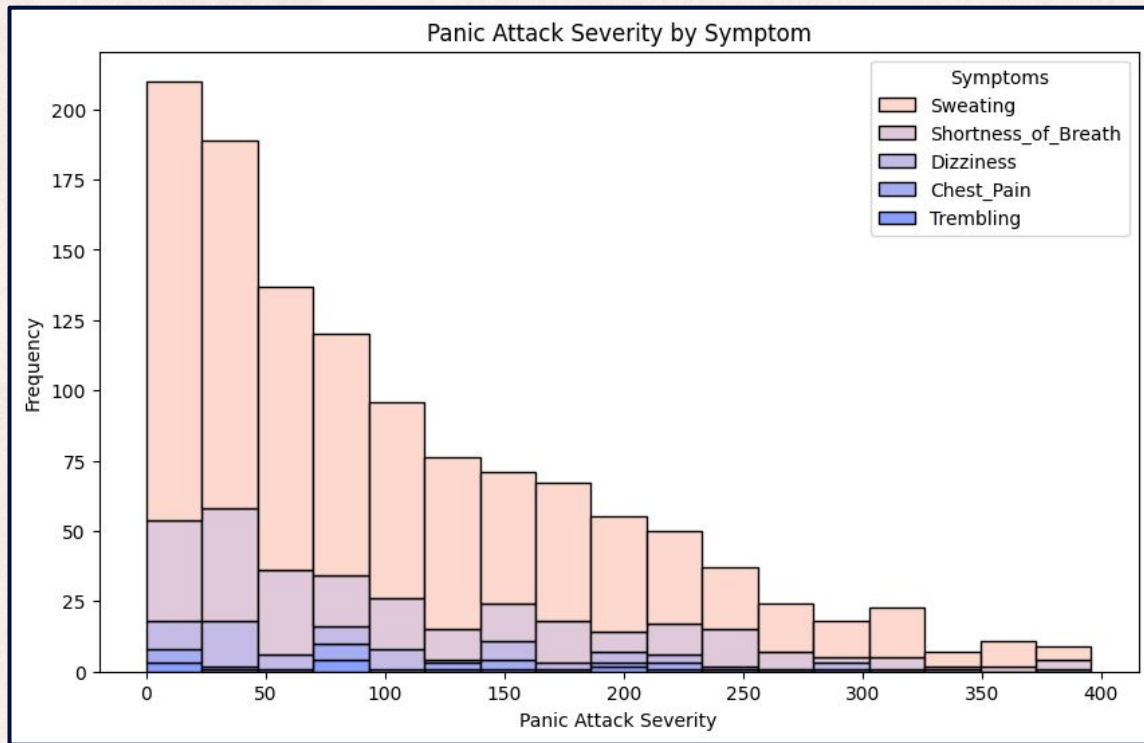|	
Caffeine	~ **17**%
Stress	~ **16**%
PTSD	~ **17**%
Social Anxiety	~ **16**%
Phobia	~ **17**%
Unknown	~ **17**%

Panic Attack Severity by Trigger

Symptoms

Sweating and shortness of breath appear to be the most common symptoms of panic attacks.

Prevalence

Sweating	~ 25%
Shortness of Breath	~ 23%
Dizziness	~ 19%
Trembling	~ 18%
Chest_Pain	~ 15%

Panic Attack Severity by Symptom

Triggers to Symptoms

Conditional Probability: P(Symptom | Trigger)

- ➤ **Caffeine**
  - ○ Chest Pain **28%**
- ➤ **PTSD**
  - ○ Chest Pain **27%**
  - ○ Shortness of Breath **19 %**
- ➤ **Phobia**
  - ○ Chest Pain **25%**
- ➤ **Social Anxiety**
  - ○ Chest Pain **26%**
  - ○ Trembling **18%**
  - ○ Sweating **17%**
- ➤ **Stress**
  - ○ Chest Pain **24%**
  - ○ Dizziness **23%**
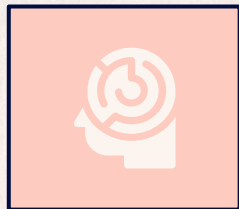 - ○ Shortness of Breath **21%**
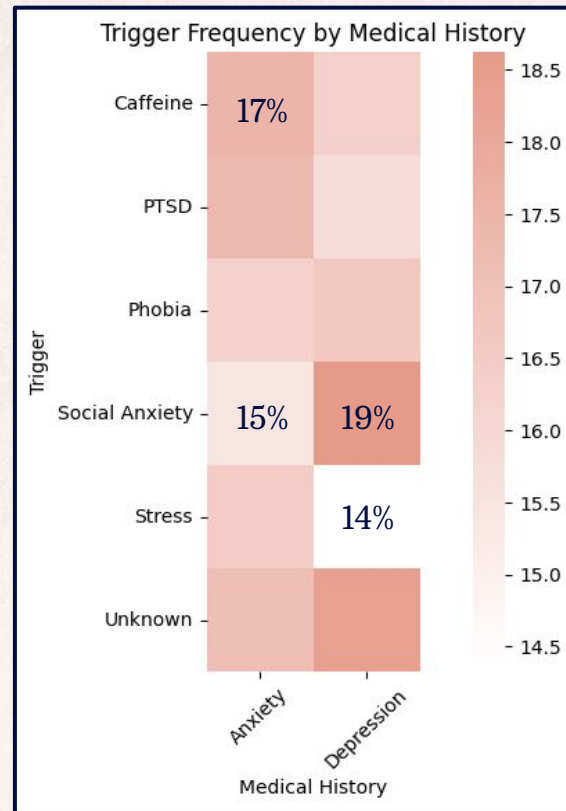
Medical History

Anerery ~ 41%

Anxiety ~ 41%

Approximately **1** in every **5** with a **history of anxiety** experience a **high-severity** panic attack.

Depression ~ 29%

Approximately **1** in every **4** with a **history of depression** experience a **high-severity** panic attack.

High-severity—defined as attacks above the **75th percentile** of average severity per episode.

Trigger Frequency by Medical History

Medical History

Anxiety ~ 41%

Approximately **1** in every **5** with a **history of anxiety** experience a **high-severity** panic attack.
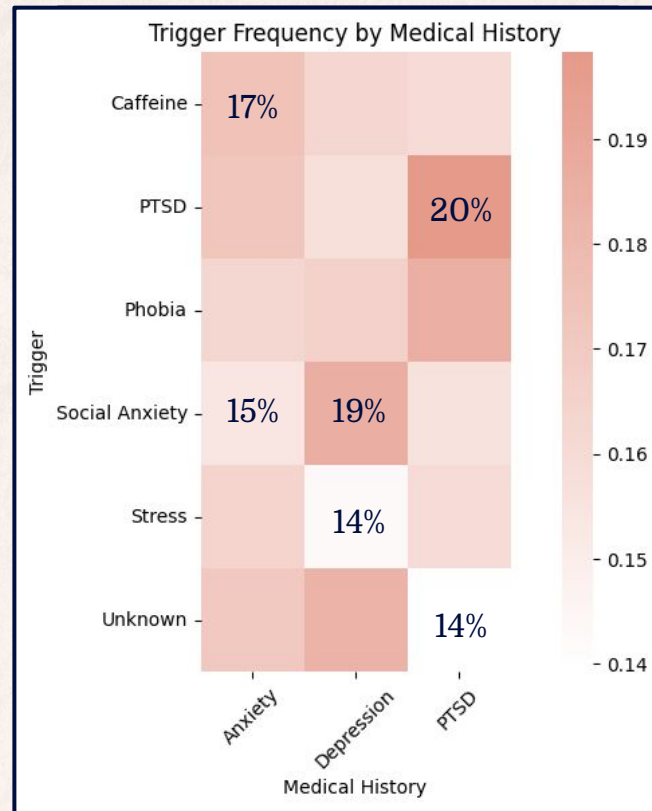
Depression ~ 29%

Approximately **1** in every **4** with a **history of depression** experience a **high-severity** panic attack.
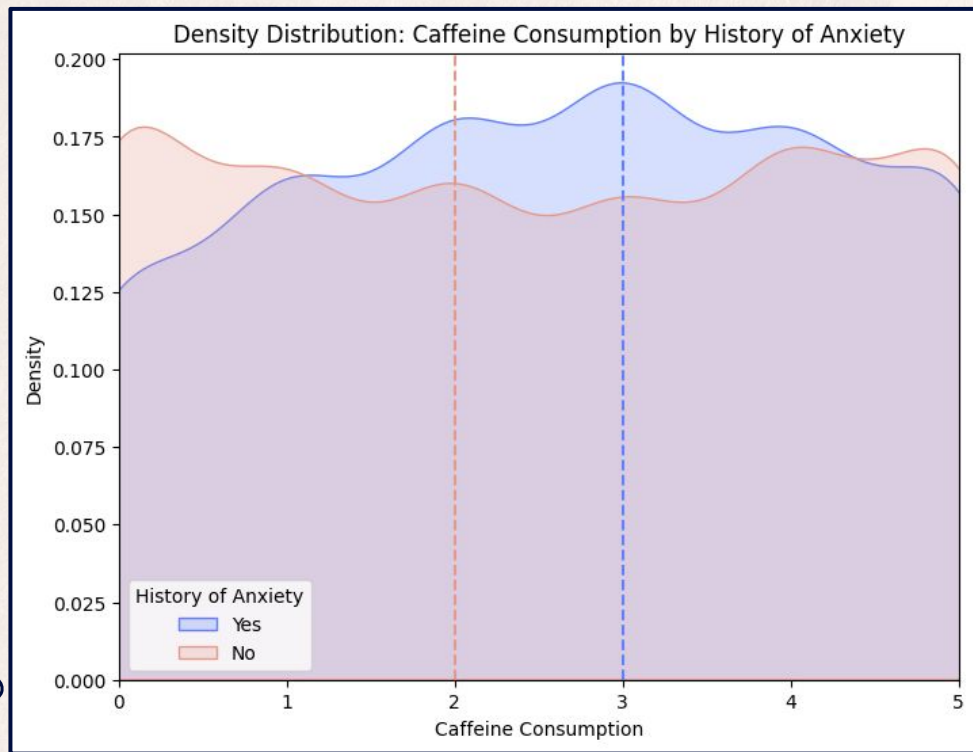
PTSD ~ 20%

Approximately **1** in every **3** with a **history of PTSD** experience a **high-severity** panic attack.

High-severity—defined as attacks above the **75th percentile** of average severity per episode.

Trigger Frequency by Medical History

Lifestyle Habits

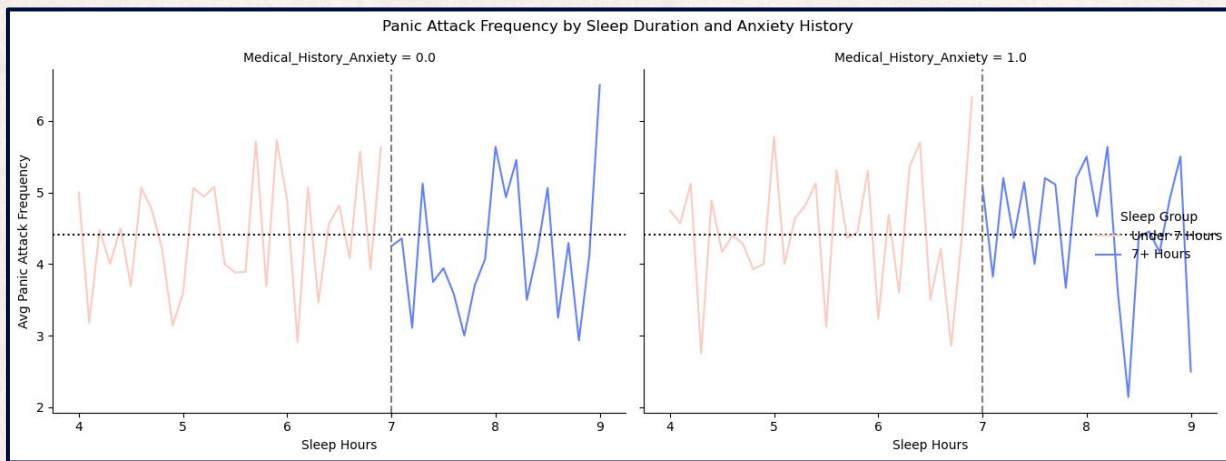Density Distribution: Caffeine Consumption by History of Anxiety

➤ **History of Anxiety as a Factor for Caffeine Consumption**
  ○ Individuals with a **history of anxiety** tend to consume **more caffeine**.

➤ **Distribution Differences in Daily Intake**
  ○ **Anxiety history** concentrate around **3 cups / day.**
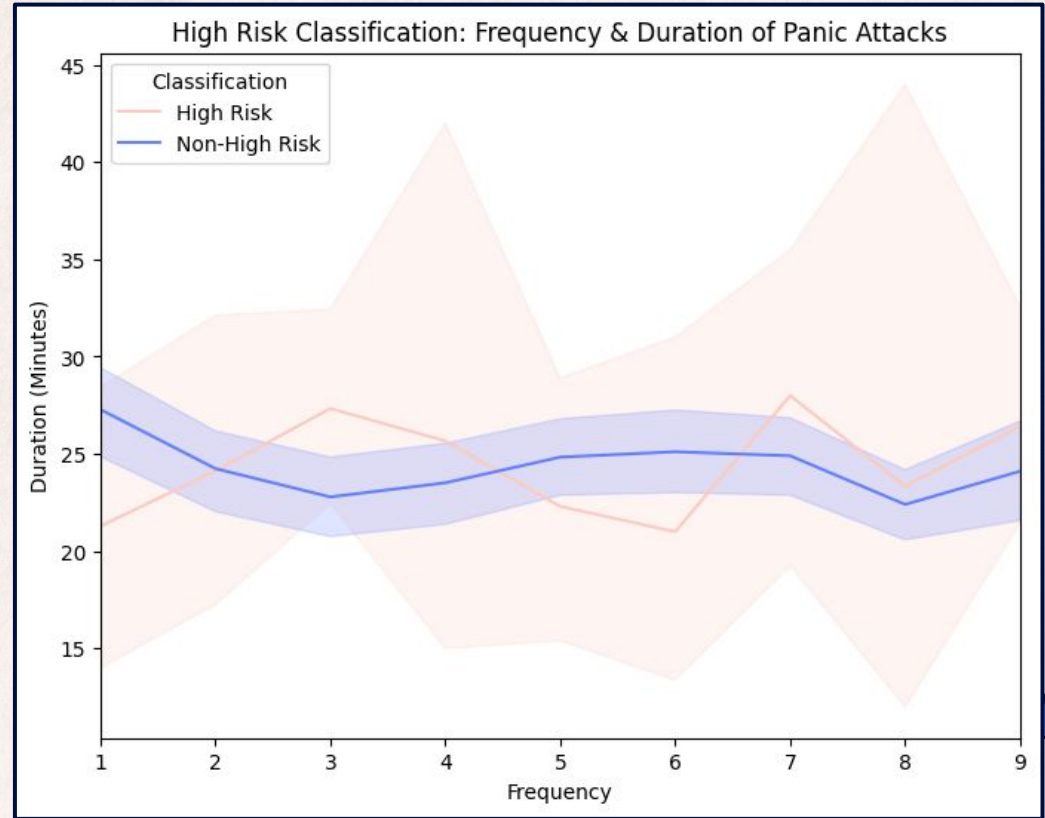 ○ **Without** anxiety history concentrate around **2 cups / day.**

Lifestyle Habits

➤ **Sleep Recommendation**
  ○ 7 Hours

➤ **Avg. Panic Attack Frequency ~ 4.4**

➤ Slight tendency for increased sleep hours to result in lower panic attack frequencies

High Risk Individuals

➢ **Hours of Sleep** < 5

➢ **Caffeine Consumption** > 3

➢ **Medical History**

  ○ Anxiety

  ○ Depression

  ○ PTSD

High Risk Classification: Frequency & Duration of Panic Attacks

Classification
- High Risk
- Non-High Risk

Duration (Minutes)

Frequency

EDA Conclusions

Lifestyle Habits

Anxiety History
~ Caffeine Consumption
Sleep Hours
~ Frequency

History of Mental Illness

Anxiety
~ Trigger: Caffeine, PTSD
Depression
~ Trigger: Social Anxiety
PTSD
~ Trigger: Phobia, PTSD
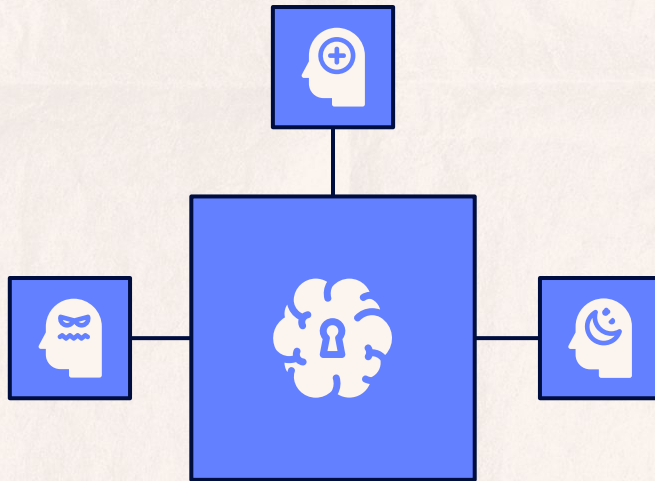
Triggers & Symptoms

Social Anxiety
~ Sweating
PTSD
~ Shortness of Breath
Stress
~ Sweating, Dizziness, Chest Pain

TREE

Regression Models
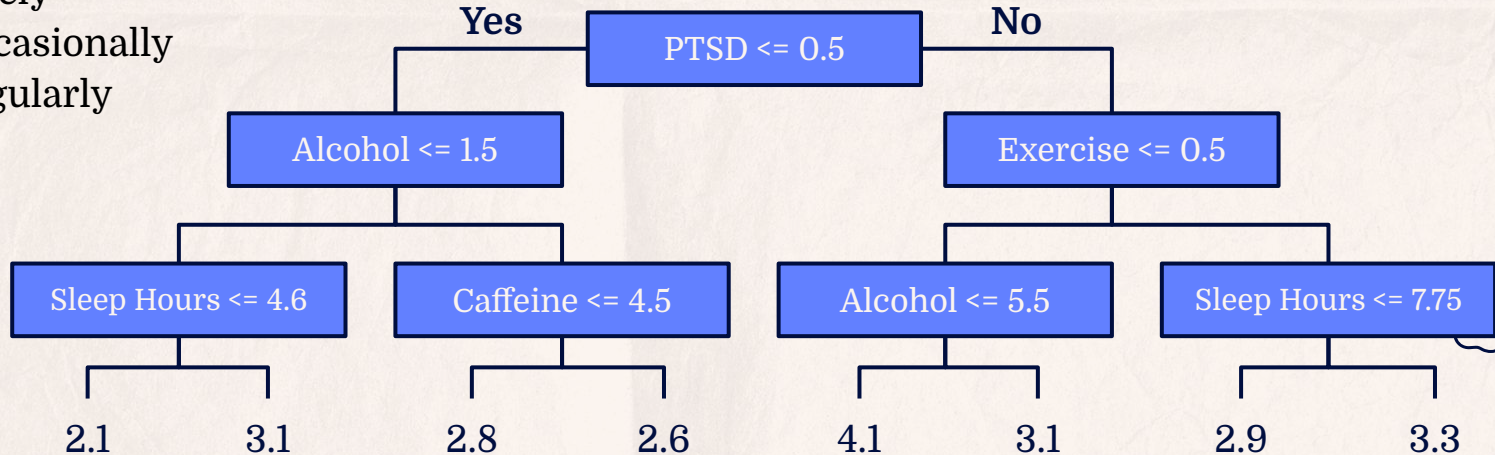
Predicting Frequency & Severity

Predicting Frequency

➢ **Accuracy:** Root Mean Square Error of 1.4

➢ **Frequency Value Scale:** 1 - 5

  ○ 1: rarely
  ○ 3: occasionally
  ○ 5: regularly

Yes   PTSD <= 0.5   **No**

Alcohol <= 1.5   Exercise <= 0.5

Sleep Hours <= 4.6   Caffeine <= 4.5   Alcohol <= 5.5   Sleep Hours <= 7.75

Expected Value: 2.1   3.1   2.8   2.6   4.1   3.1   2.9   3.3

Predicting Severity

Target: Severity
Factors:
~ Caffeine Intake
~ Hours of Sleep
~ Exercise Frequency
~ Alcohol Intake

➢ **Accuracy:** Root Mean Square Error of 1

➢ **Severity Scale:** 1 - 5
   ○ 1: low
   ○ 3: medium
   ○ 5: high

Yes Caffeine <= 0.5 **No**

Sleep Hours <= 5.15

Sleep Hours <= 8.25

Alcohol <= 2.5

Exercise <= 3.5

Sleep Hours <= 7.85

Sleep Hours <= 8.95

Expected Value: 2   1.2   2   2.5   1.8   2.4   1.6   2.5

Regression Tree Conclusions

➢ **What can be observed?**

  ○ History of PTSD leads to higher amounts of panic attacks.

  ○ A correlation exists between high severity and high sleep hours.

➢ **Who does this help?**

  ○ Aids doctors on how to advise patients to decrease their panic attacks.

➢ **Future Investigations:**

  ○ Create trees for each age group / gender to see how factors affect different demographics.

Thank You

Any questions?