



# 2021 DataFest Drug Misuse Analysis

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Team Extra 5

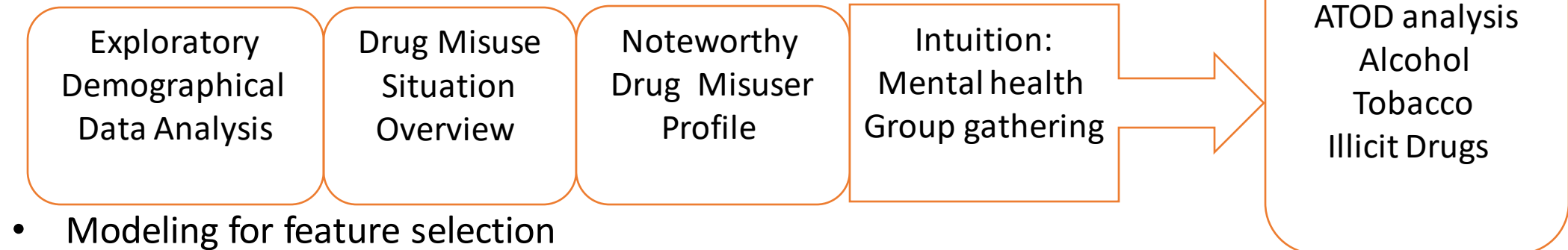
Bodong Xu, Jay Lin, Jiajun Wang, Ningyi Xue,  
Shan Xiang

# Introduction

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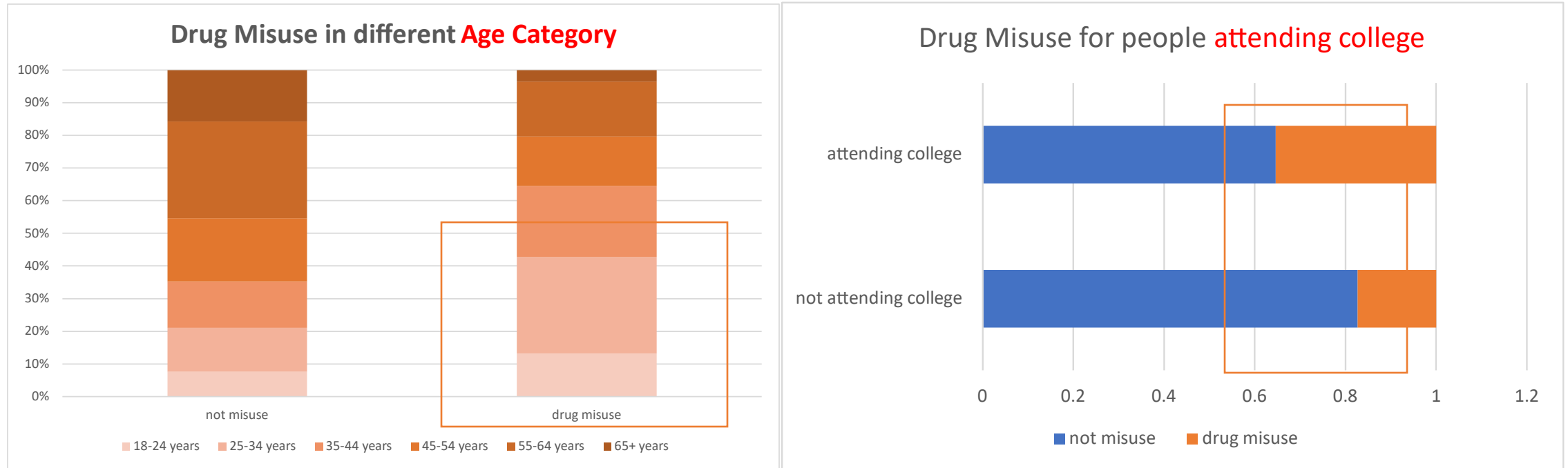
- Our team try to explore some in-depth patterns that are significant to drug misuse in order to optimize the survey with more concentrated questions.
- We use 2018 US NMURx dataset to do the analysis
- We created a new feature that summarized misuse cases from all drugs to analyze overall misuse condition
  - 0 – Never misuse any drugs
  - 1 – misuse at least one drug

- Our Analysis Roadmap



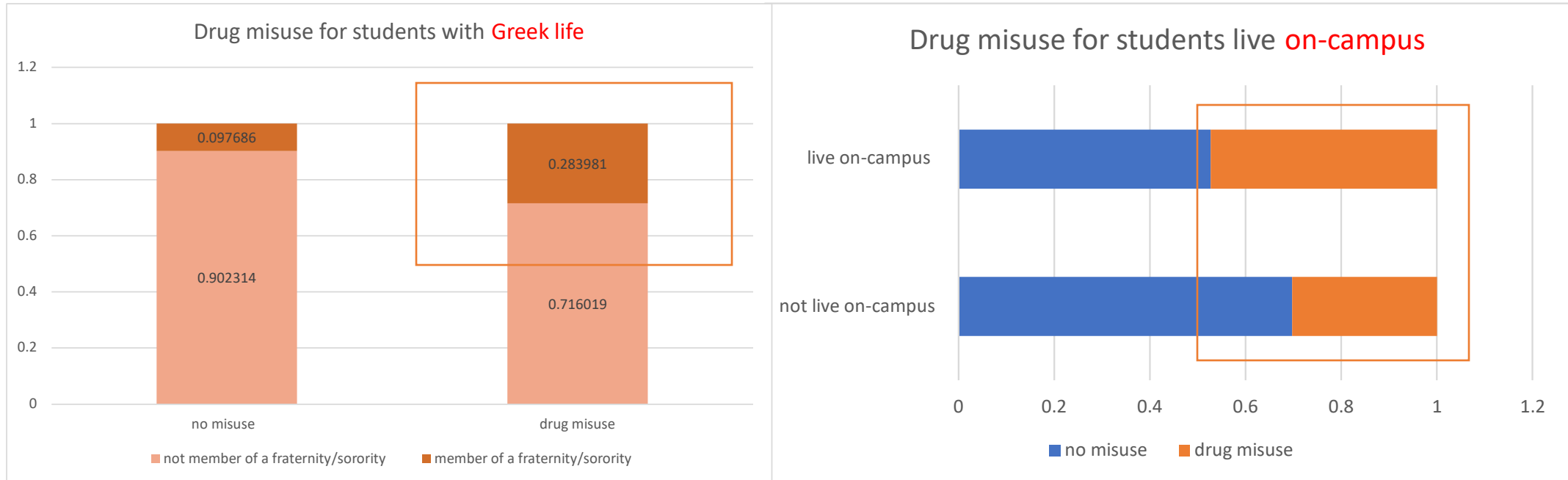
- Modeling for feature selection

# Demographical Characteristics



- Around half of participants with drug misuse history are **under the age of 34**, compared with people without drug misuse whose median age is around 54 years old.
- For people who **attending any college within the last 3 months**, there are more reported of drug misuse compared with people who are not students.
- Based on these findings, we will do further exploratory analysis regarding college student profiles.

# College Student Profile



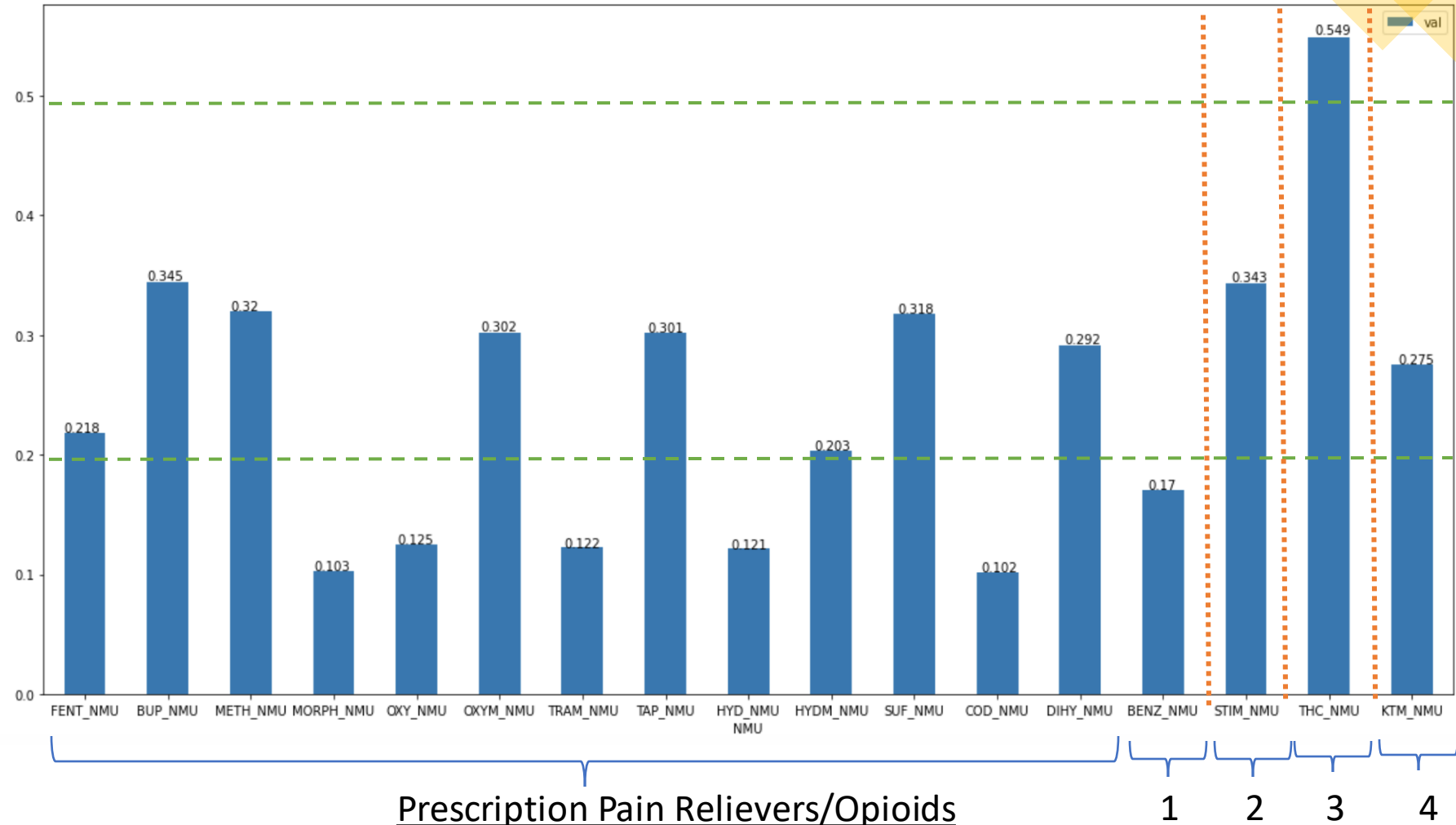
- College students who report drug misuse are more likely to be **member of a fraternity/sorority** than students without drug misuse history.
- College students who **live on-campus** are more likely to be associated with drug misuse than students live off campus.

# Prescription Addiction Analysis

- Parallel Comparison for 17 Prescription Drugs
- The percentage of misuse with each prescription
- Three ranges:
  - Over 0.5
  - 0.2 - 0.5
  - Under 0.2

Note:

- 1: Benzodiazepines
- 2: Stimulants
- 3: THC/Cannabinoids
- 4: Ketamine

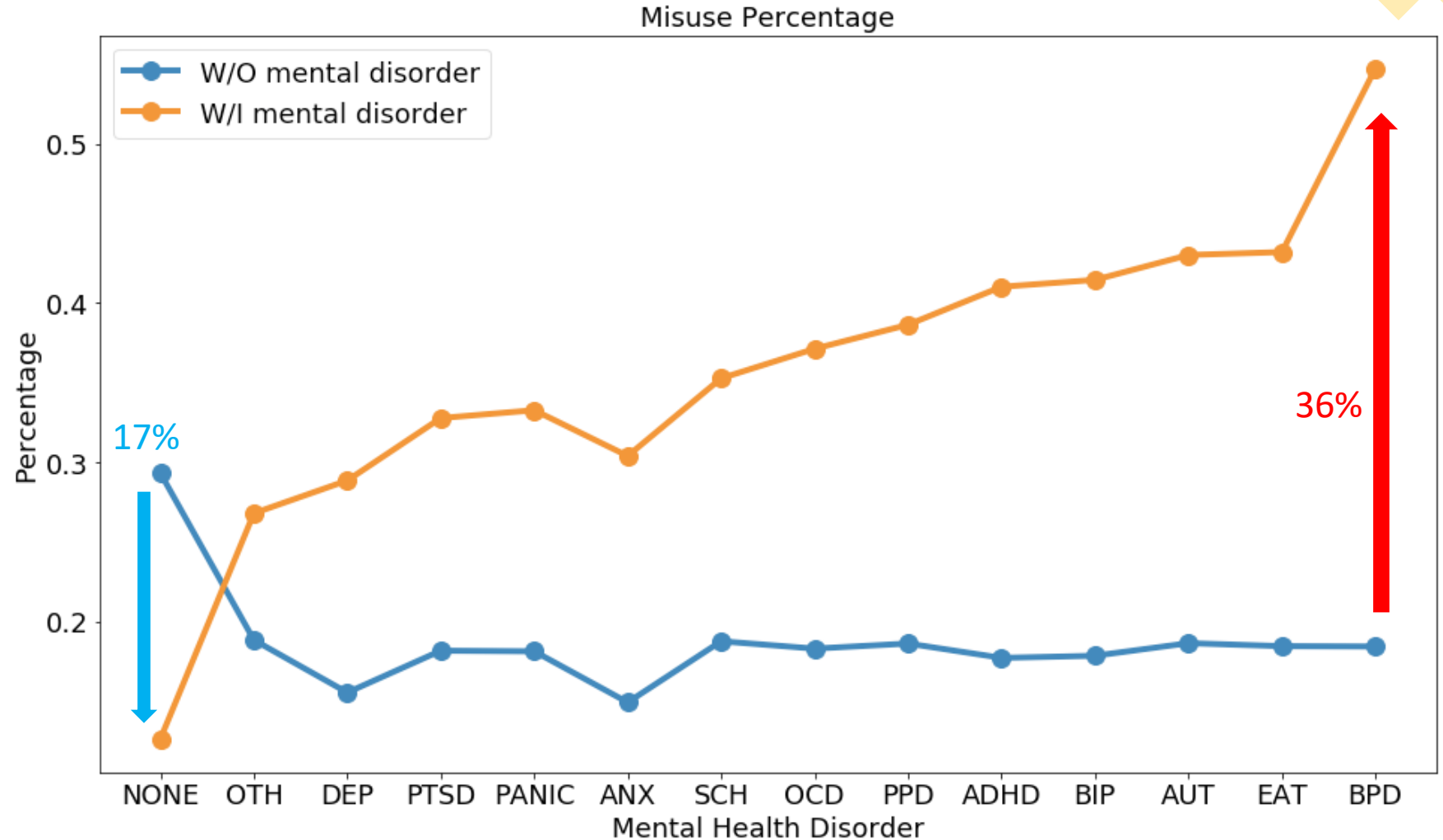


# Mental Health Analysis

- Mental disorder show strong correlation with misuse

- TOP 3 GAP:

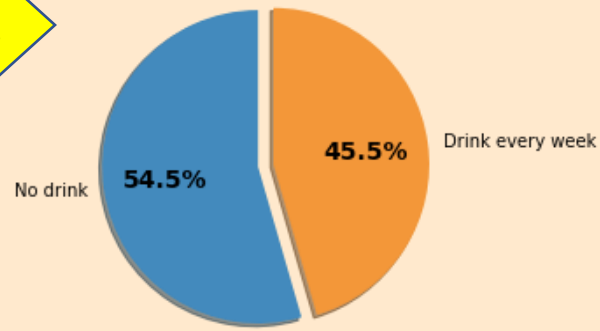
1. BPD(Borderline Personality Disorder)
2. EAT(Eating Disorder)
3. AUT(Autism)



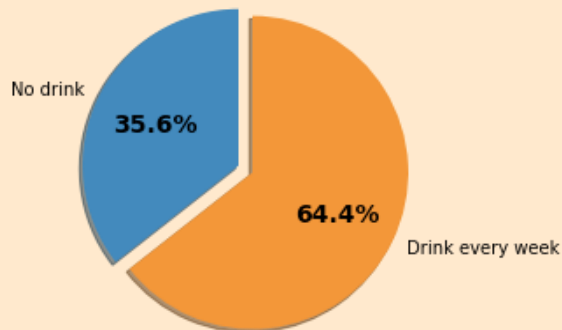
# Misuse Analysis - Alcohol

1

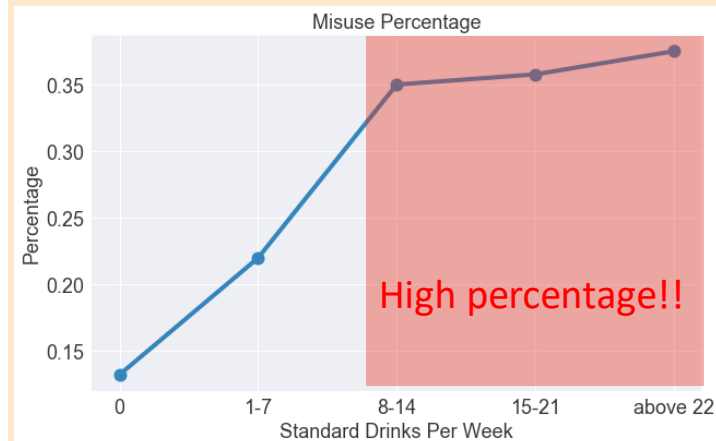
## Never Misuse



## Misuse



2



1

People seldom consumed Alcohol:

- Misuse is 18.9% less than never misuse

People consumed Alcohol every week:

- Misuse is 18.9 higher than never misuse

2

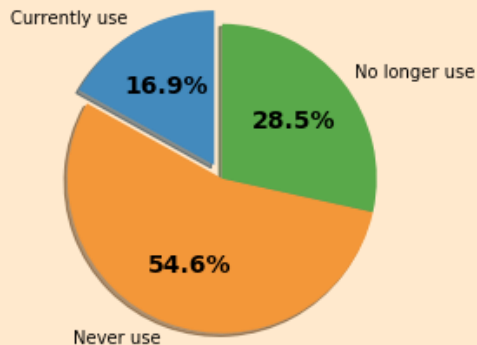
The level of misuse:

- Above 22– **Severest**
- Above 8 drinks – **High percentage of misuse**
- Seldom consumed – **less than 10 percentage**

# Misuse Analysis - Tobacco

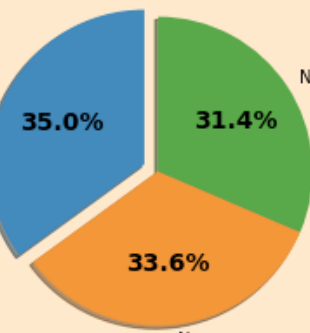
## Never Misuse

1



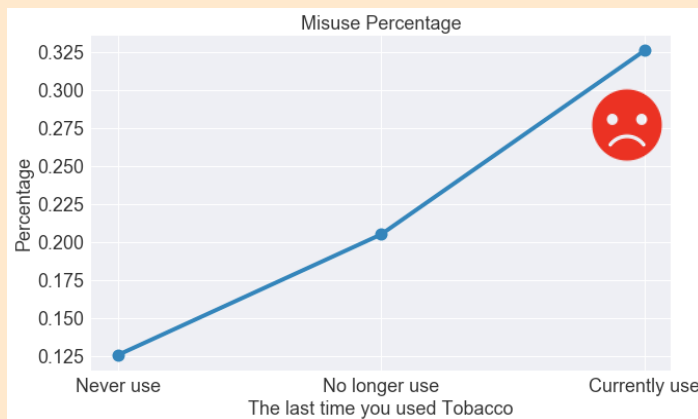
## Misuse

Currently use



Never use

2



1

People never used tobacco:

- Misuse is 21% less than never misuse

People ever used tobacco:

- Currently use increase by 18.1%
- No longer use slightly increased by 2.9%

2

The level of misuse:

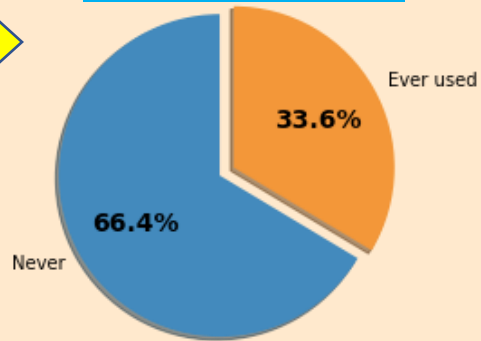
- Currently use – **Severest**
- Never use tobacco – ~12.5%



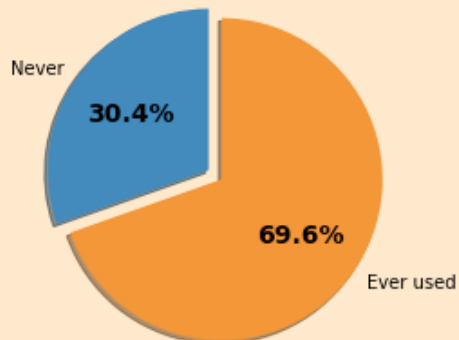
# Misuse Analysis – Drugs

1

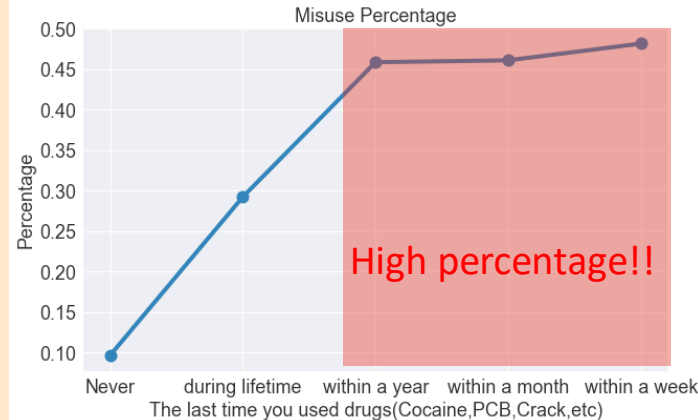
## Never Misuse



## Misuse



2



1

## People never used drugs:

- Misuse is **36%** less than never misuse

## People ever used drugs:

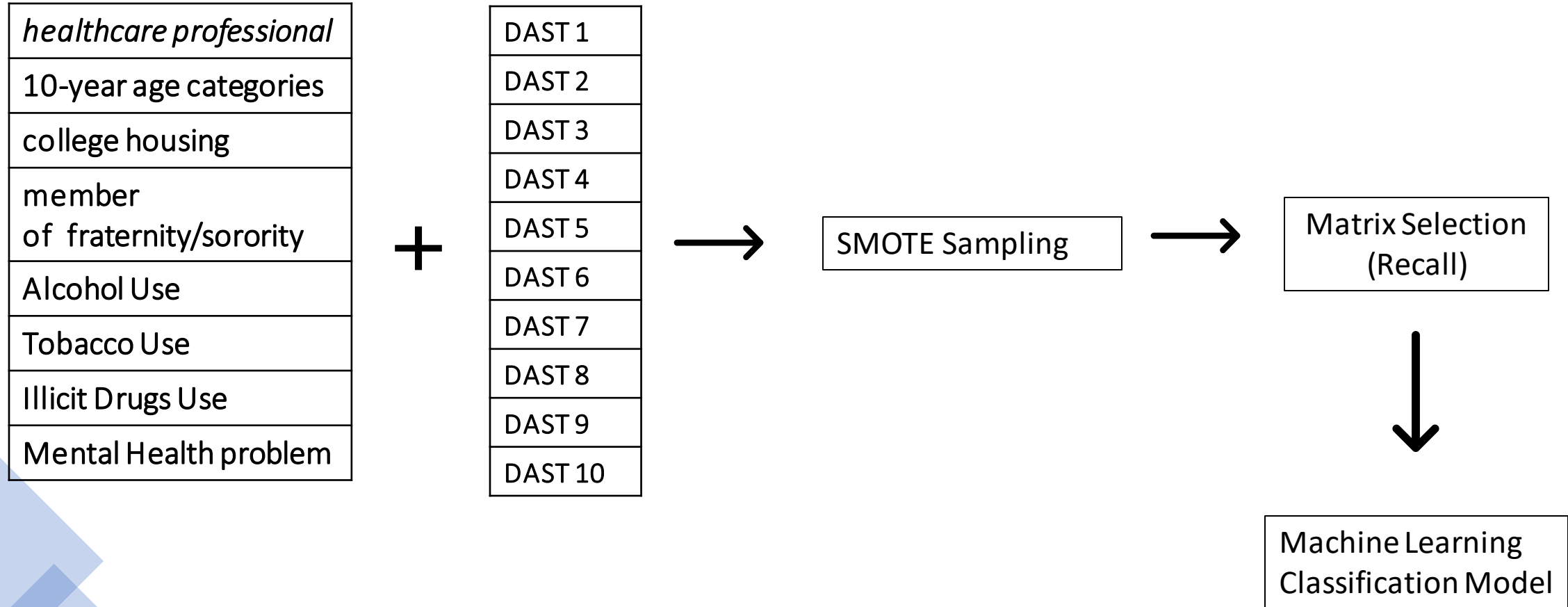
- Misuse is **36%** higher than never misuse

2

## The level of misuse:

- Within a week – **Severe**
- Within a year – High percentage of misuse
- Never use drugs – **less than 10 percentage**

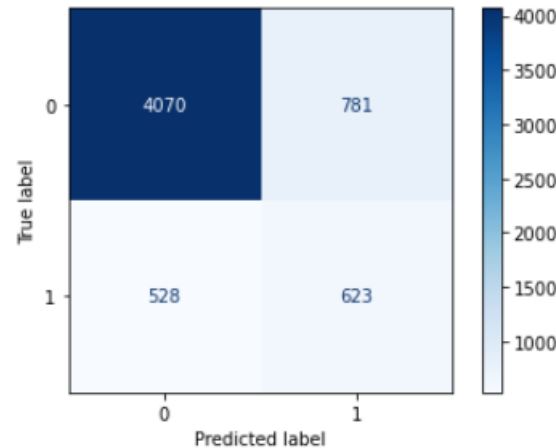
# Machine Learning Modeling



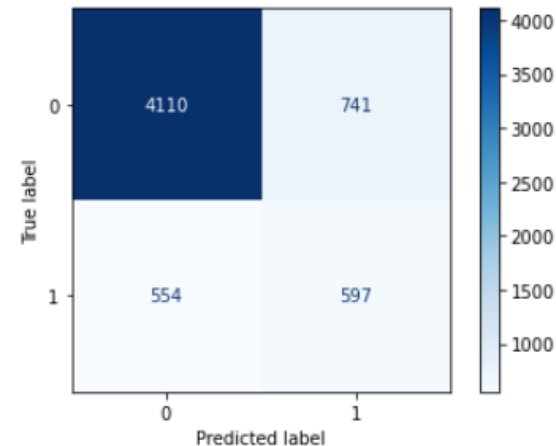
# Confusion Matrix - Comparison

Logistic Regression

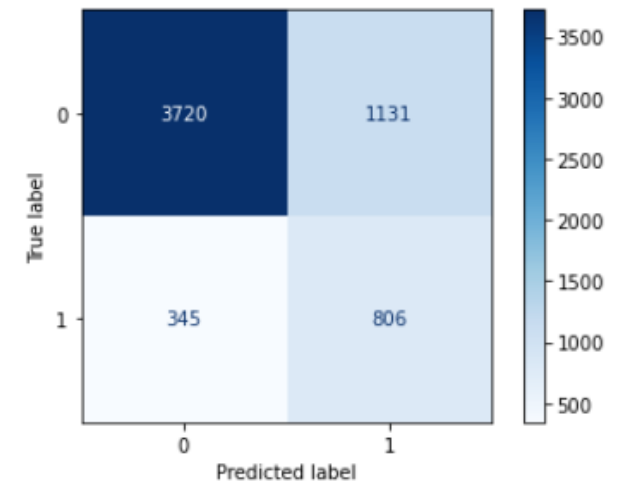
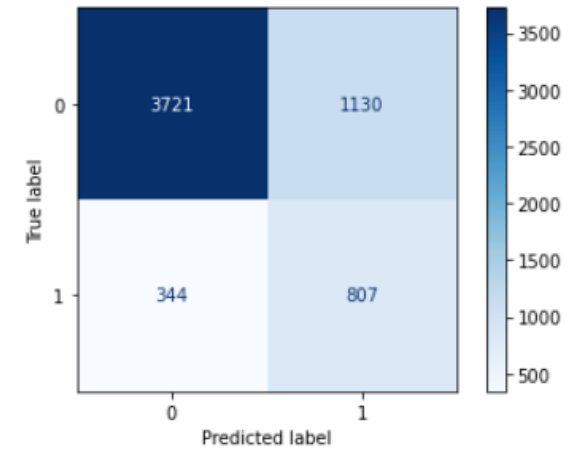
DAST 10 Questions



Support Vector Machine



DAST 10 + related features



# Questions Selection - Recommendation

Logistic Regression

Features	importance
DAST1	1.014
Fraternity/sororitymember	0.81
Mental Health problem	0.696
DAST3	0.588
Illicit Drugs Use	0.534
DAST2	0.509
DAST6	0.451
DAST8	0.434
healthcare professional	0.397
DAST7	0.356

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Support Vector Machine

Features	importance
DAST1	1.042
Fraternity/sororitymember	0.728
Illicit Drugs Use	0.507
Mental Health problem	0.507
DAST3	0.507
DAST6	0.308
College housing	0.285
DAST2	0.259
healthcare professional	0.24
10-year age categories	0.239



Recommendation  
Features

Features
DAST1
Fraternity/sororitymember
Mental Health problem
DAST3
Illicit Drugs Use
DAST2
DAST6
healthcare professional

# Thank you for watching!

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