



Preventing Hard Drug Abuse

Niko & David
Project 2 | NeueFische | Oct-08-2020



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Agenda

1. **Introduction**
What's going on here?

2. **Data Exploration**
What have we found out?

3. **Usage Prediction**
Finding those who need our help...

4. **Next Steps**
What's still to come?

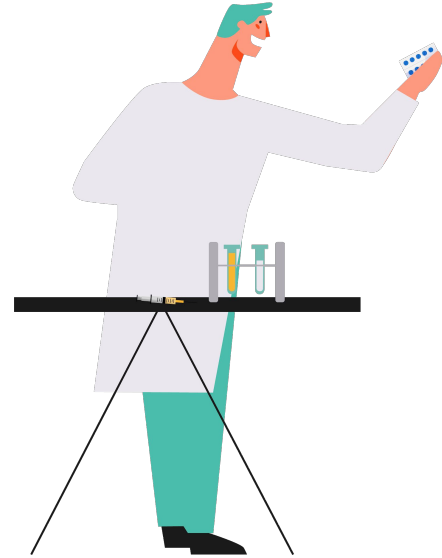
The Team



Niko

Former Veterinarian -

Swear an oath to save lives.

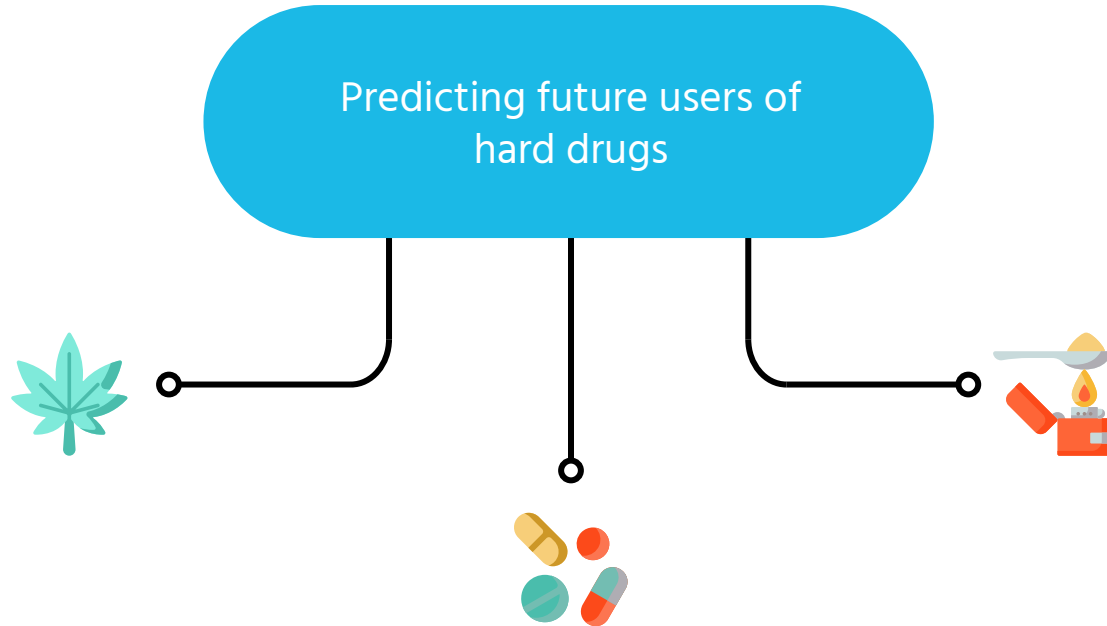


David

Former Business Manager -

Found out about the
economical potential of the
drug business.

The goal



1. Introduction



Facts & figures

Dataset Contents

Demographics

Age

Gender

Education Level

Ethnicity

Country

Psychometrics

Big5 Scores

Impulsiveness
Score

Sensation Seeking
Score

Drugs

Last Usage for 19
different drugs

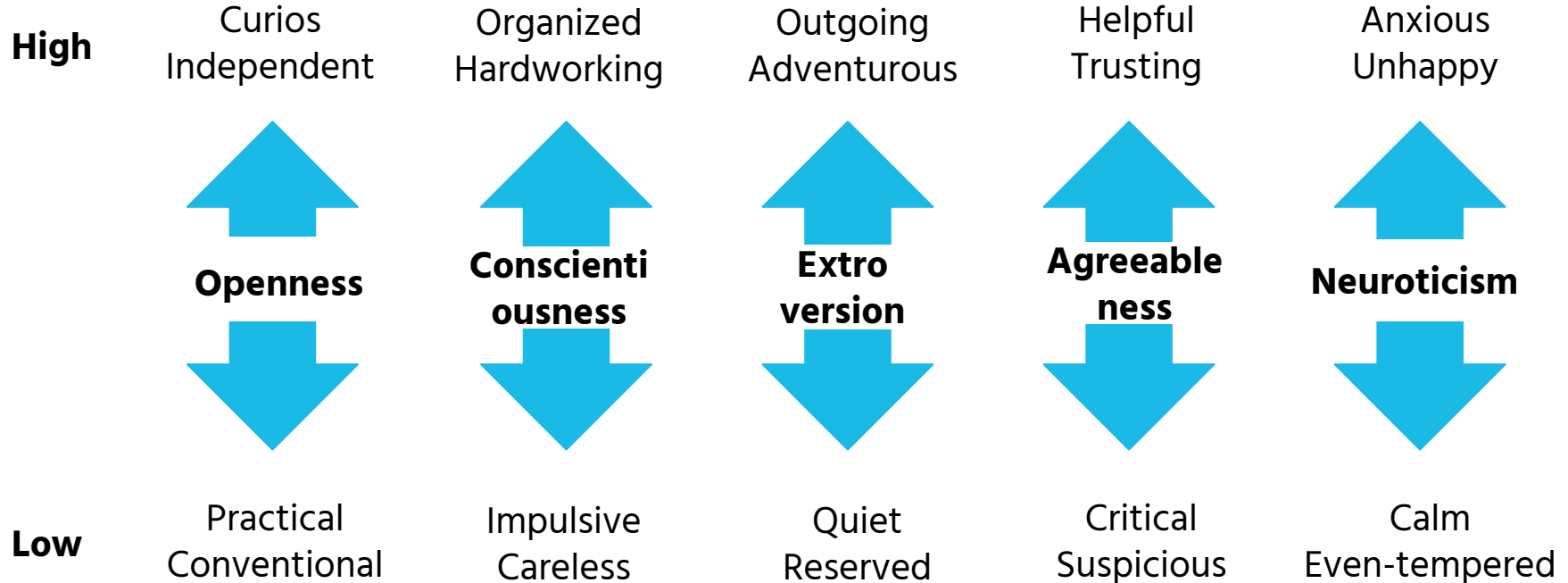


**1885
observations**

**anonymous
online
survey**

**published
2011**

Big5 Personality Traits



Defining Drug Categories

Based on:

- Ratio effective dose / lethal dose
- Potential of dependency

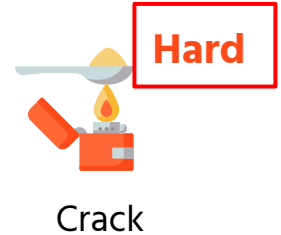
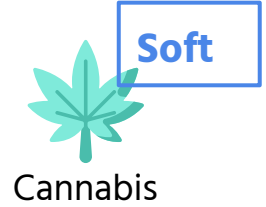
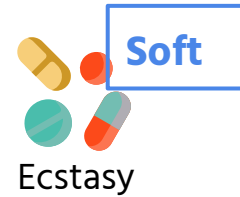
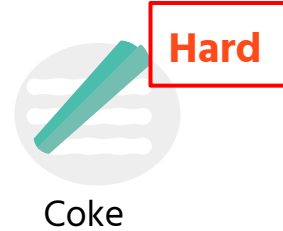


The interactive part

Oh no!
I mixed up all the
soft and hard
drugs... :-((

Soft?

Hard?



Drug Classification

Soft drugs

- Amyl
- Ecstasy
- Legalh
- LSD
- VSA
- Cannabis
- Shrooms

Not recognized:

- Nicotine

Hard drugs

- Amphet
- Benzos
- Coke
- Crack
- Heroin
- Meth
- Ketamin

Not recognized:

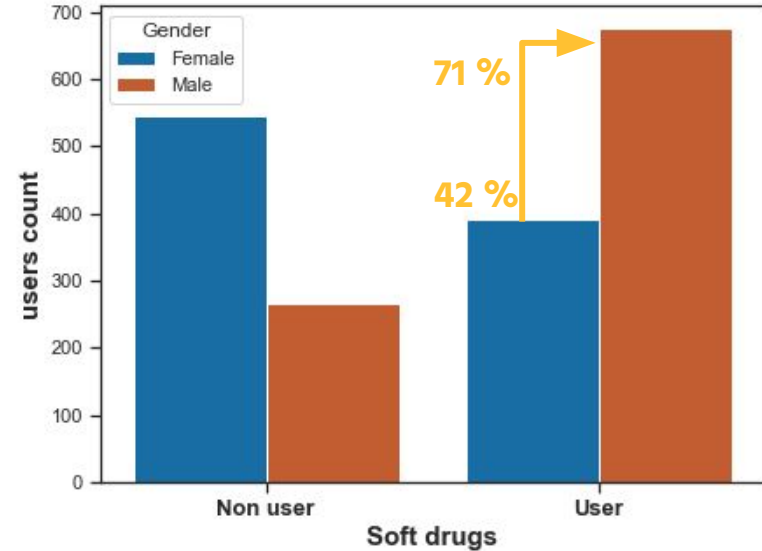
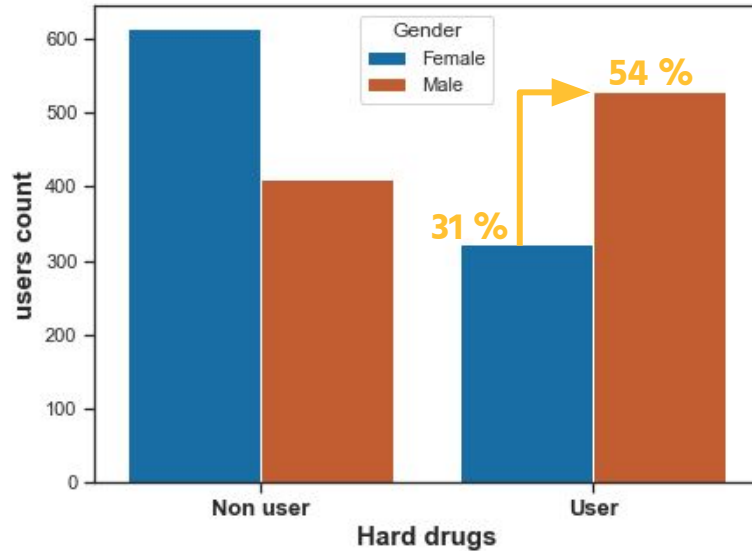
- Alcohol

What have we found out?

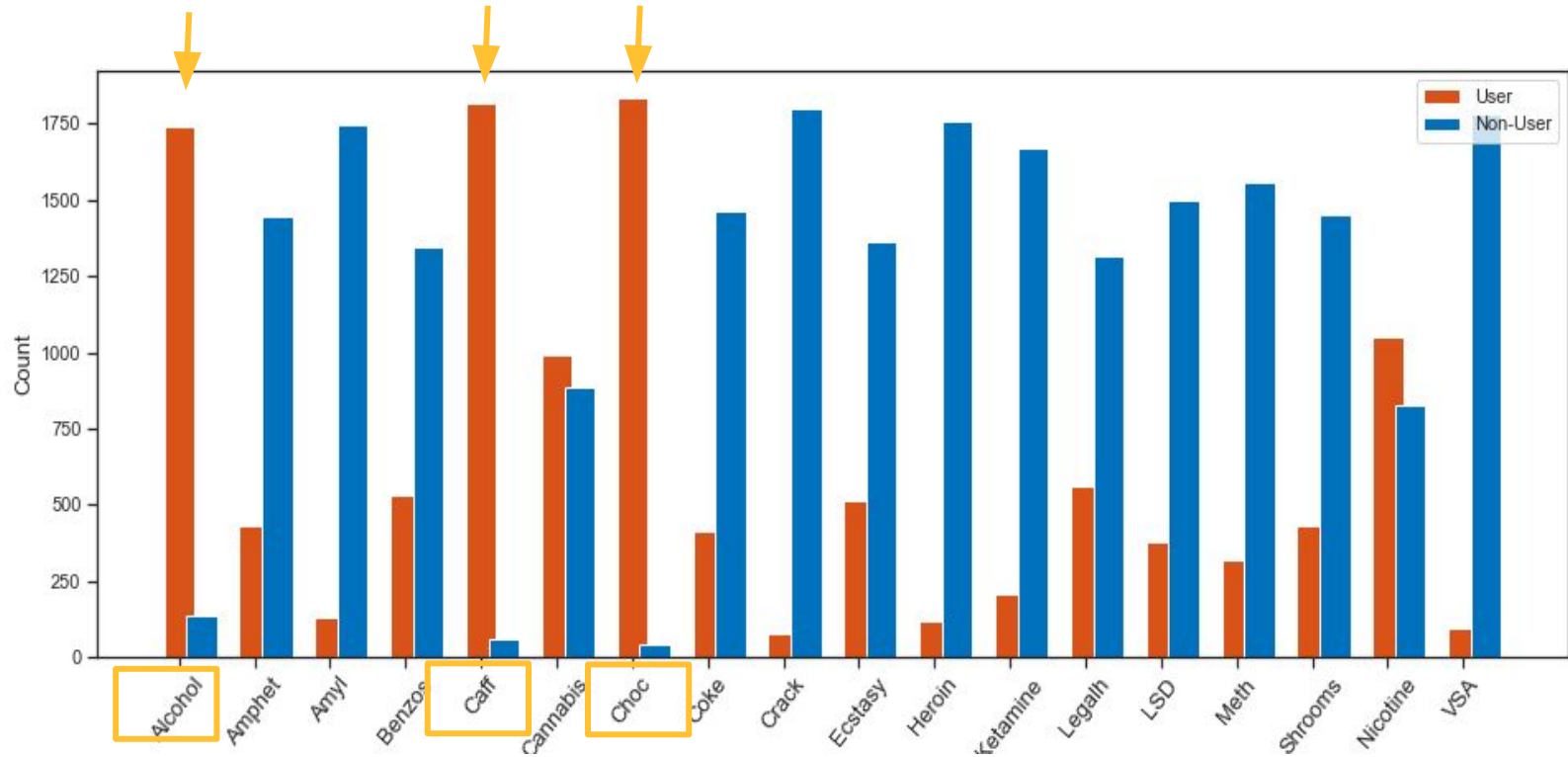


2. Data Exploration

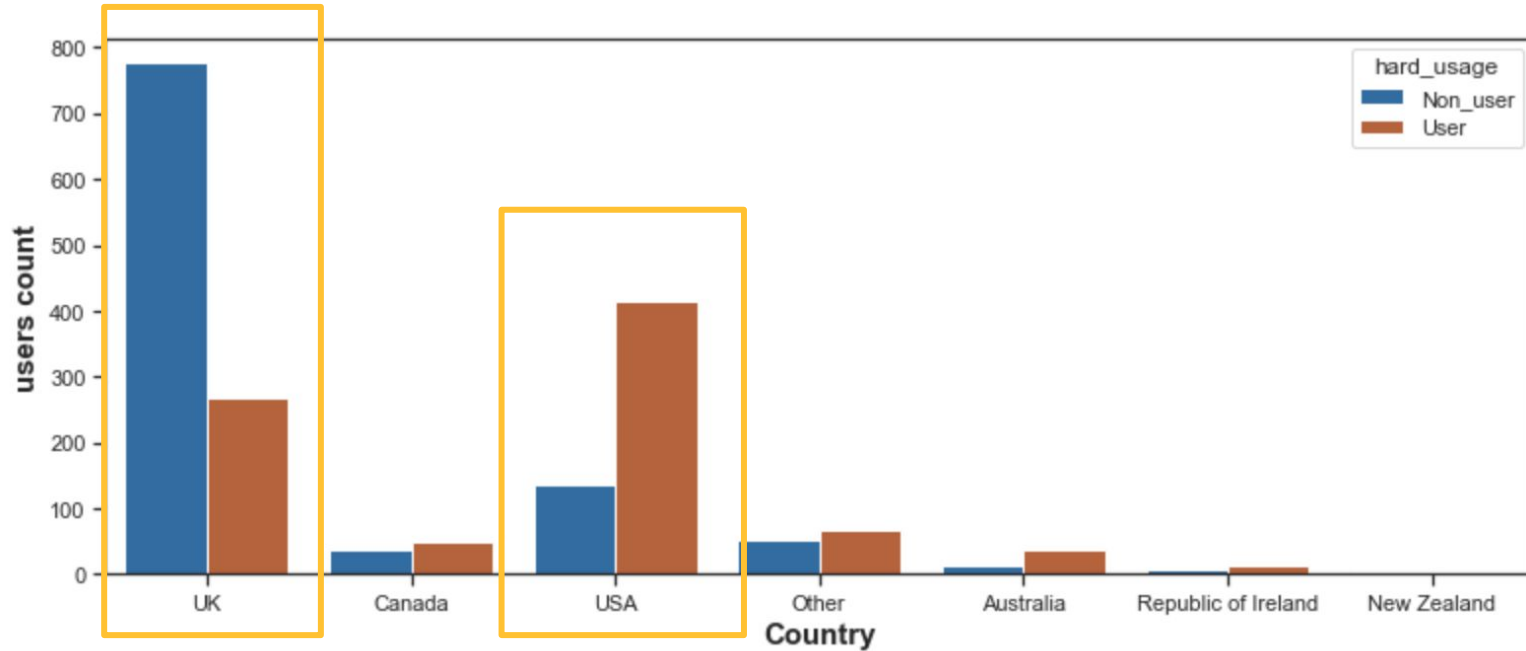
Drug Usage by Gender



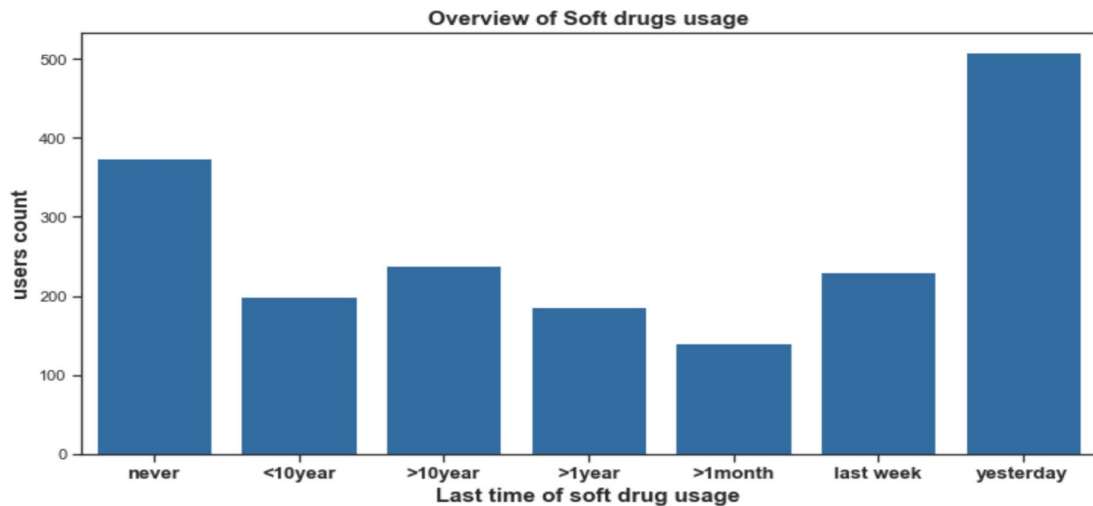
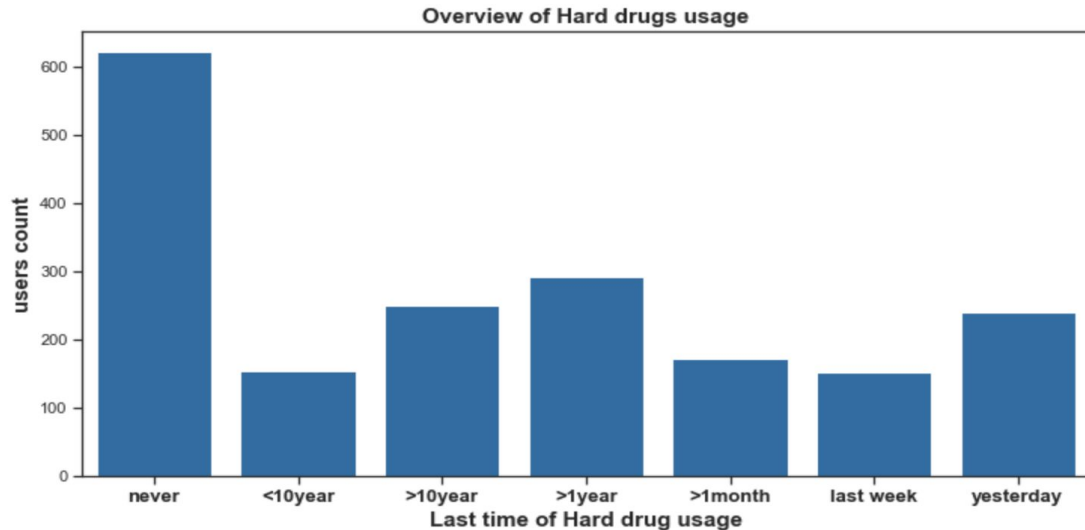
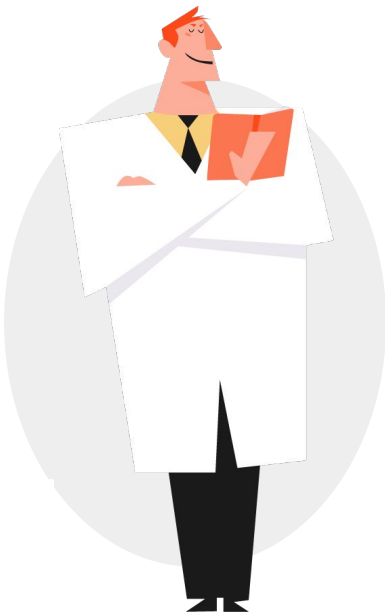
Drugs and their usage



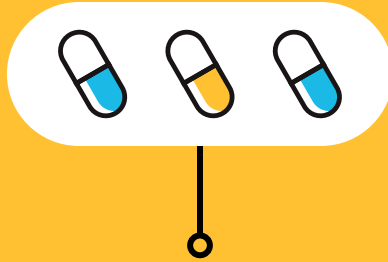
Hard Drug Usage by Country



Drug Usage and Frequency

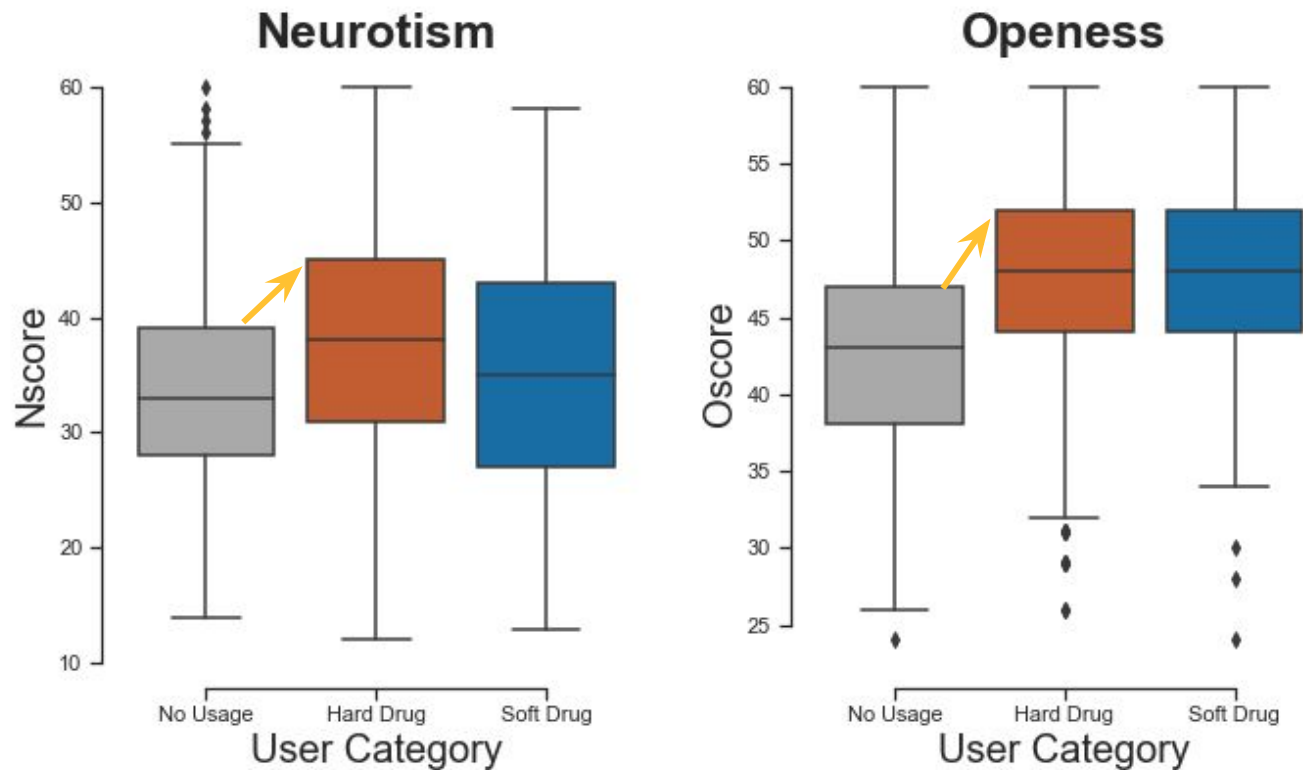


3. Prediction

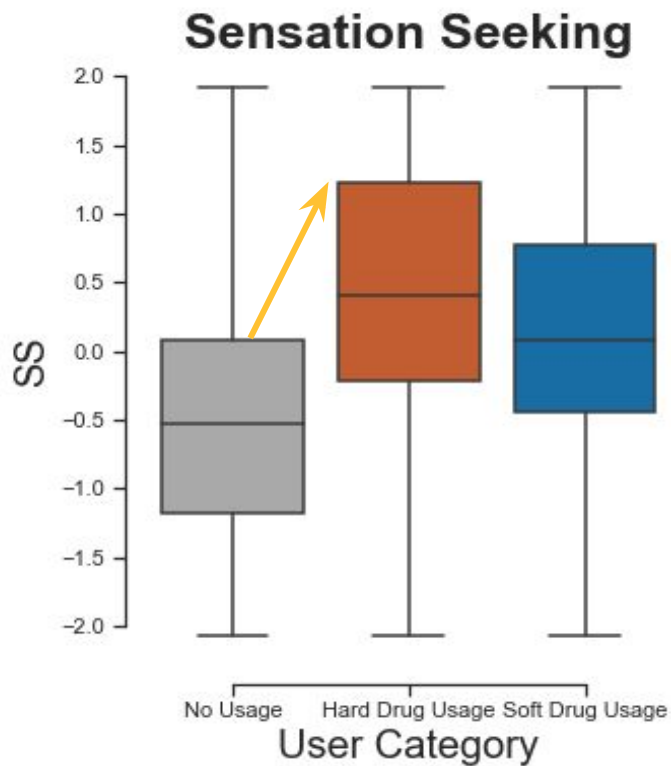
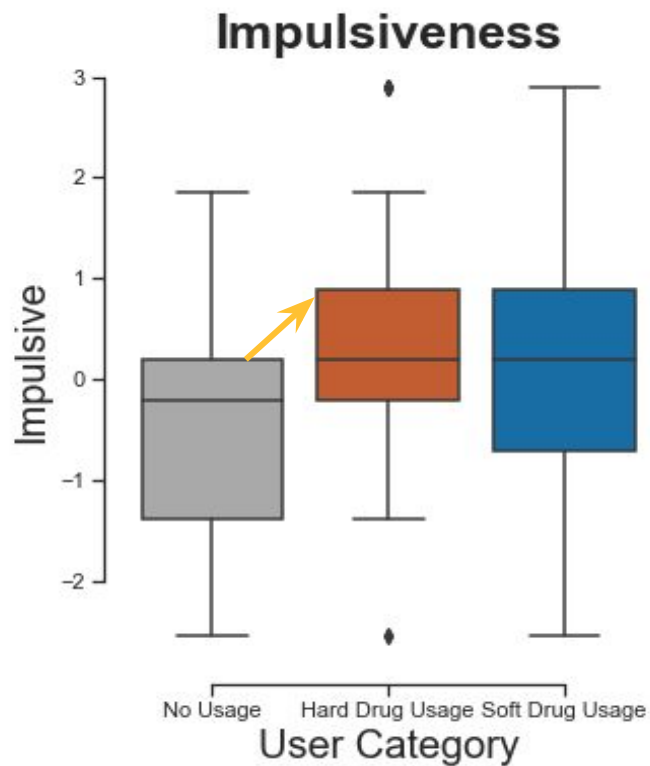


**How is in danger of getting
addicted?**

Personality traits



Personality traits



Prediction Approaches



All observations

- 1877 individuals



Selected group

- 300 individuals, selected by:
 - Neuroticism above mean
 - Openness above mean
 - Impulsiveness above mean
 - Sensation Seeking above mean.
 - Conscientiousness below mean

Predict Hard Drug Usage (all individuals)

Baseline Predictions

Random Forest | XGBoost | DecisionTree |
AdaBoost | kNN | Logistic Reg | SVM

Best Pos. Recall: 86 %

Best Accuracy: 75 %

Optimized Prediction

Random Forest | XGBoost | SVM
** Gridsearch for Parameters **

Best Pos. Recall: 89 %

Best Accuracy: 77 %

Predict Hard Drug Usage (all individuals)

Baseline Predictions

Random Forest | XGBoost | DecisionTree |
AdaBoost | kNN | Logistic Reg | SVM

Best Pos. Recall: 96 %

Best Accuracy: 73 %

Optimized Prediction

Random Forest | XGBoost | SVM
** Gridsearch for Parameters **

Best Pos. Recall: 97 %

Best Accuracy: 77 %

Learnings and next steps



4. Conclusion

Main results

- ↑ Openness ↑ Impulsiveness ↑ SS increase risk for drug usage
- It is indeed possible to predict hard drug usage for “high scorers”
- Don’t trust all data you receive (Semeron...)
- Be extremely careful when dealing with features like ethnicity, country of origin, gender etc.
- Do not underestimate the health risks of alcohol.



Next steps

- Collect samples that allow the usage of the country feature and that represent the overall population of the countries
- Get time-related data to find out more about the relationship between drug usage and time-related factors
- Gather information about the effect of preventive actions regarding hard drug usage
- Use unsupervised learning algorithm to create clusters of different drugs and personality types





Thanks!

All results on github

<https://github.com/dave-py>

<https://github.com/stervet>

Sources

See next slide

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