

What makes a happy employee?

TERRI TUSON



Motivation

HAPPY EMPLOYEES

Happy employees are 13% more productive.

In 2019, almost £92 billion and 38 working days per employee was lost as a result of ill physical & mental health.

WORKING LIFE

We spend a third of our waking day and a third of our life at work.

And the majority of us have no choice but to work!

CHANGES IN EMPLOYMENT

Current trends in employment are eroding levels of job satisfaction, such as changes in technology, changes to industry, and changes to working practices especially post COVID.



SCOPE & DATA ACQUISITION

Research datasets that are suitable for the project.

Better understand the scope of the project and the landscape in which it sits.

DATA CLEANING & EXPLORATION

Keep relevant data and remove unwanted to dataset.

So we are left with a smaller dataset to use.

DATA MODELLING

Define hypotheses.
Select classification models to predict success.

MODEL EVALUATION

Analyse the performance of the models based on accuracy, AUROC scores and PR scores.

MODEL INSIGHTS

Define the findings of the best performing classification models through coefficients

Capstone Framework

Dataset

THE EUROPEAN SKILLS AND JOBS SURVEY (ESJS)

- 28 European countries
- 2014
- 48676 x 293

Aims to provide robust information from representative samples of adult workers on a set of core variables, including:

- sociodemographic characteristics;
- job characteristics;
- job-skill requirements;
- skill mismatches;
- initial and continuing vocational education and training participation;
- labour market outcomes.

Hypotheses

• • • • •

HYPOTHESIS 1

We can predict better than baseline whether an individual is likely to enjoy their job.

Our measure of success will be accuracy, with AUROC and PR scores for a more in-depth analysis, if necessary.

HYPOTHESIS 2

Factors related to skills mismatch can predict better than baseline whether an individual is likely to enjoy their job.

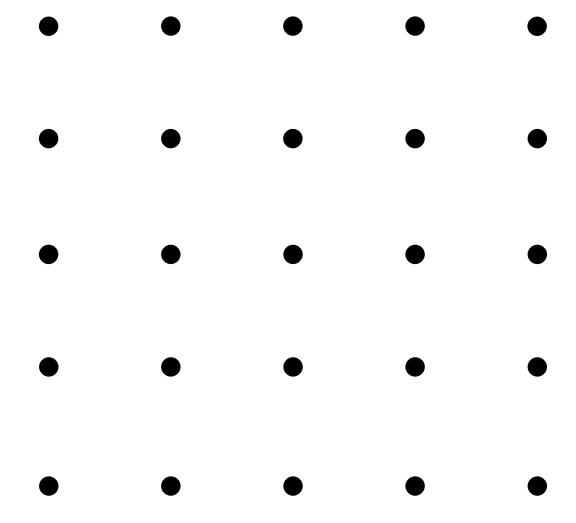
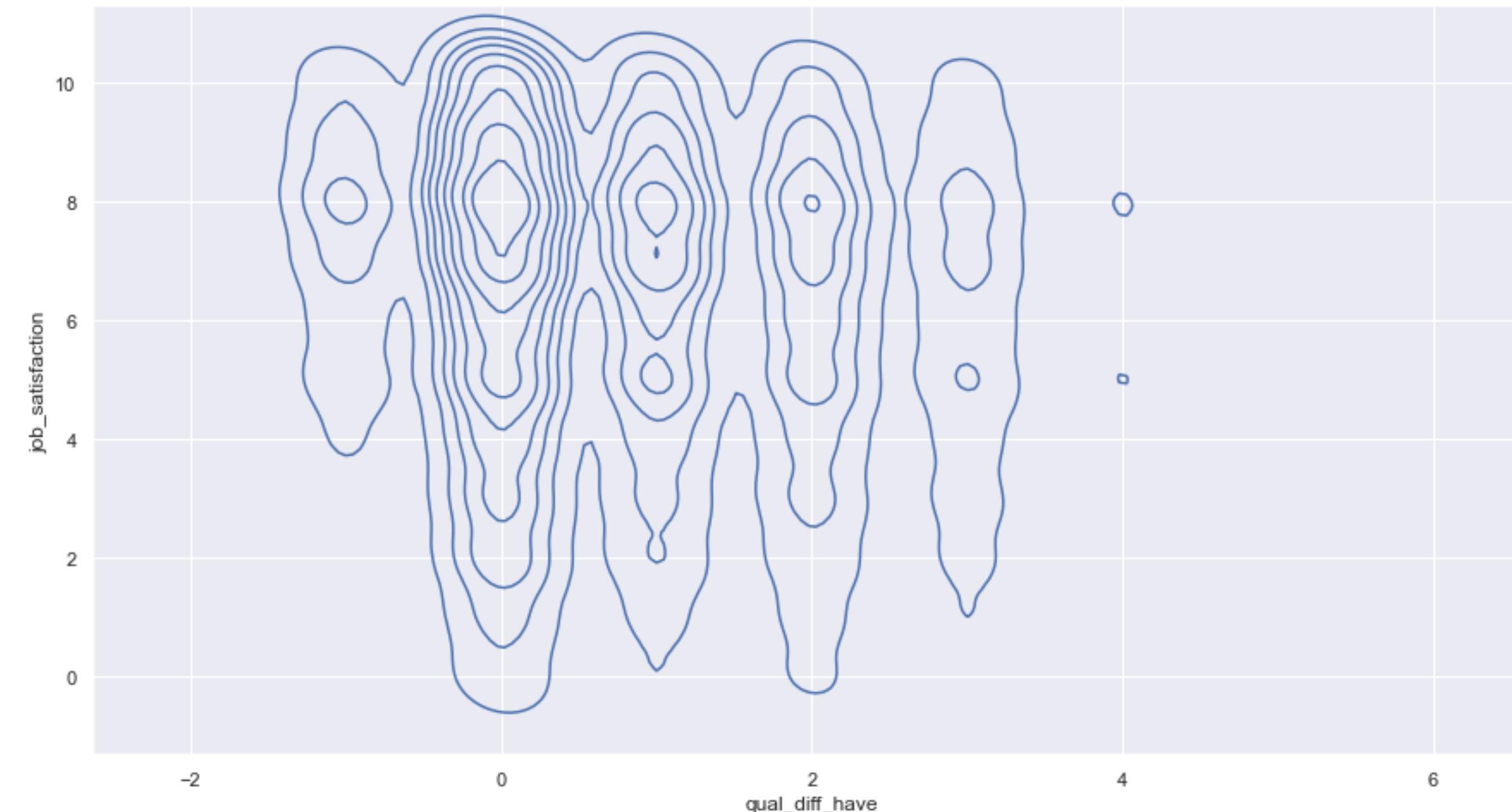
Our measure of success will be accuracy, with AUROC and PR scores for a more in-depth analysis, if necessary.

• • • • •

Feature Engineering

Overskilling
Underskilling
Over-qualification
Under-qualification
Horizontal mismatch

In-Depth Feature Engineering



64

Happiest Age

4/10

How people with the highest salary
rate their job satisfaction

EXPLORING THE DATA

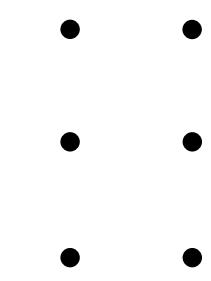
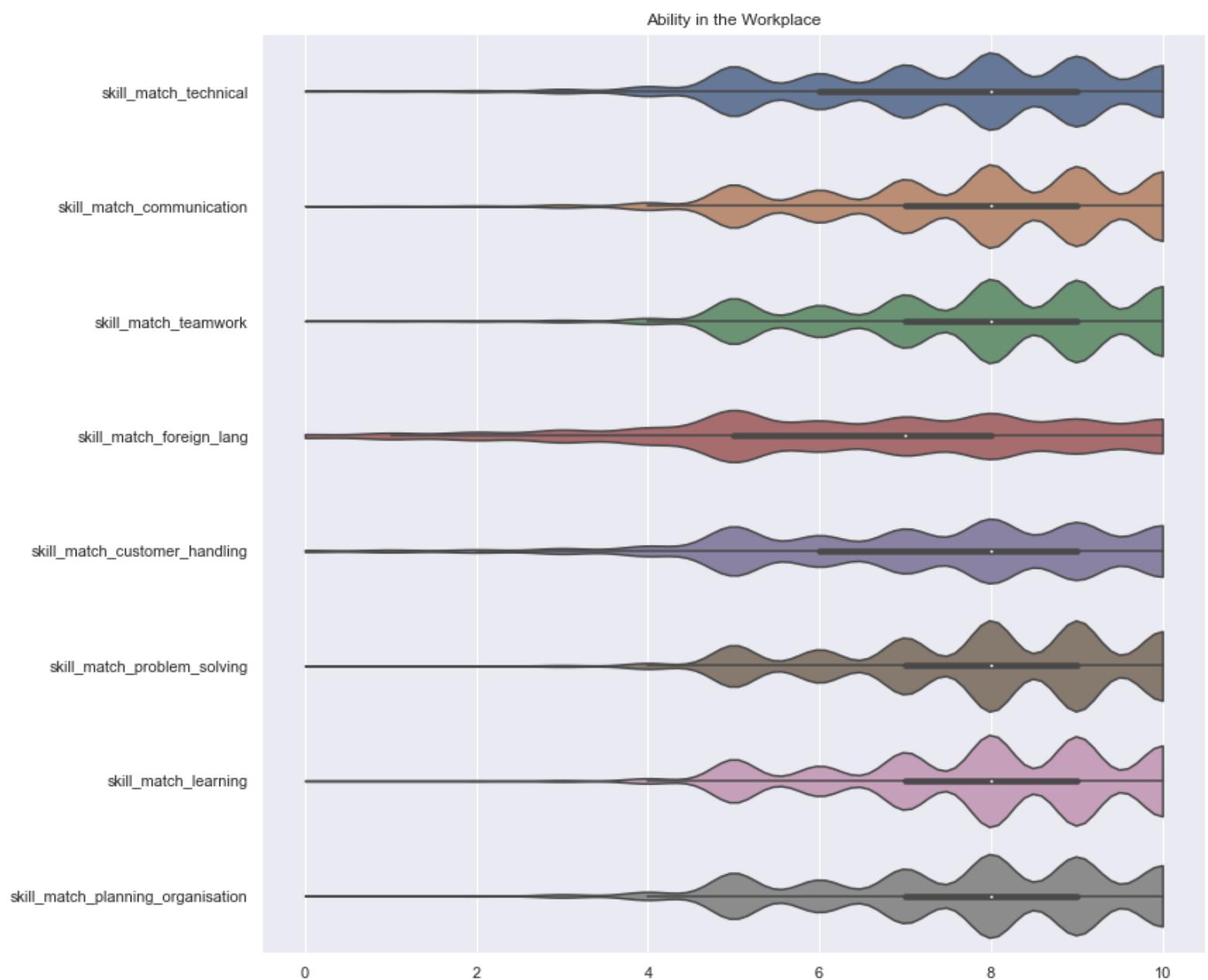
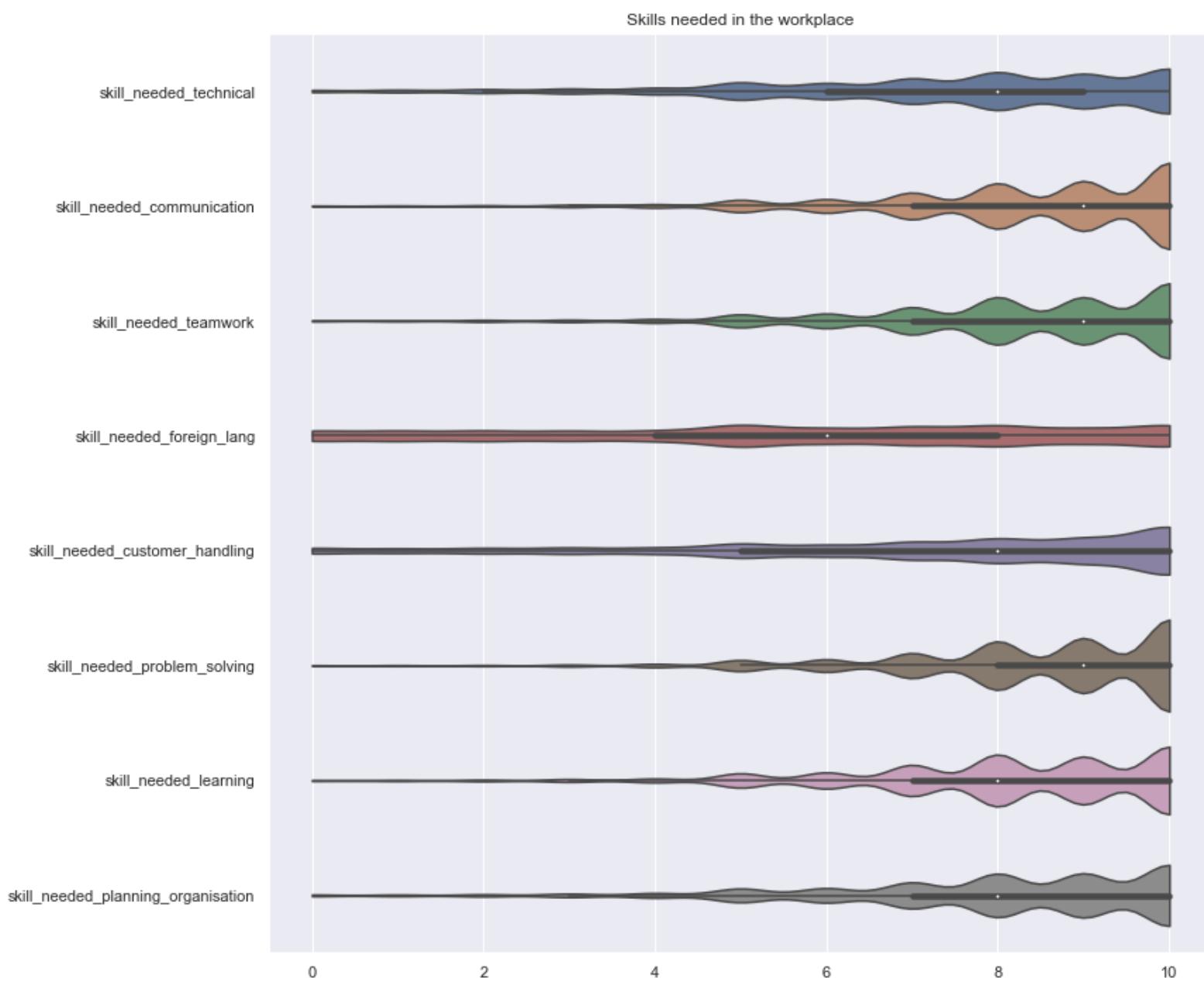
LUXEMBOURG

Happiest Country

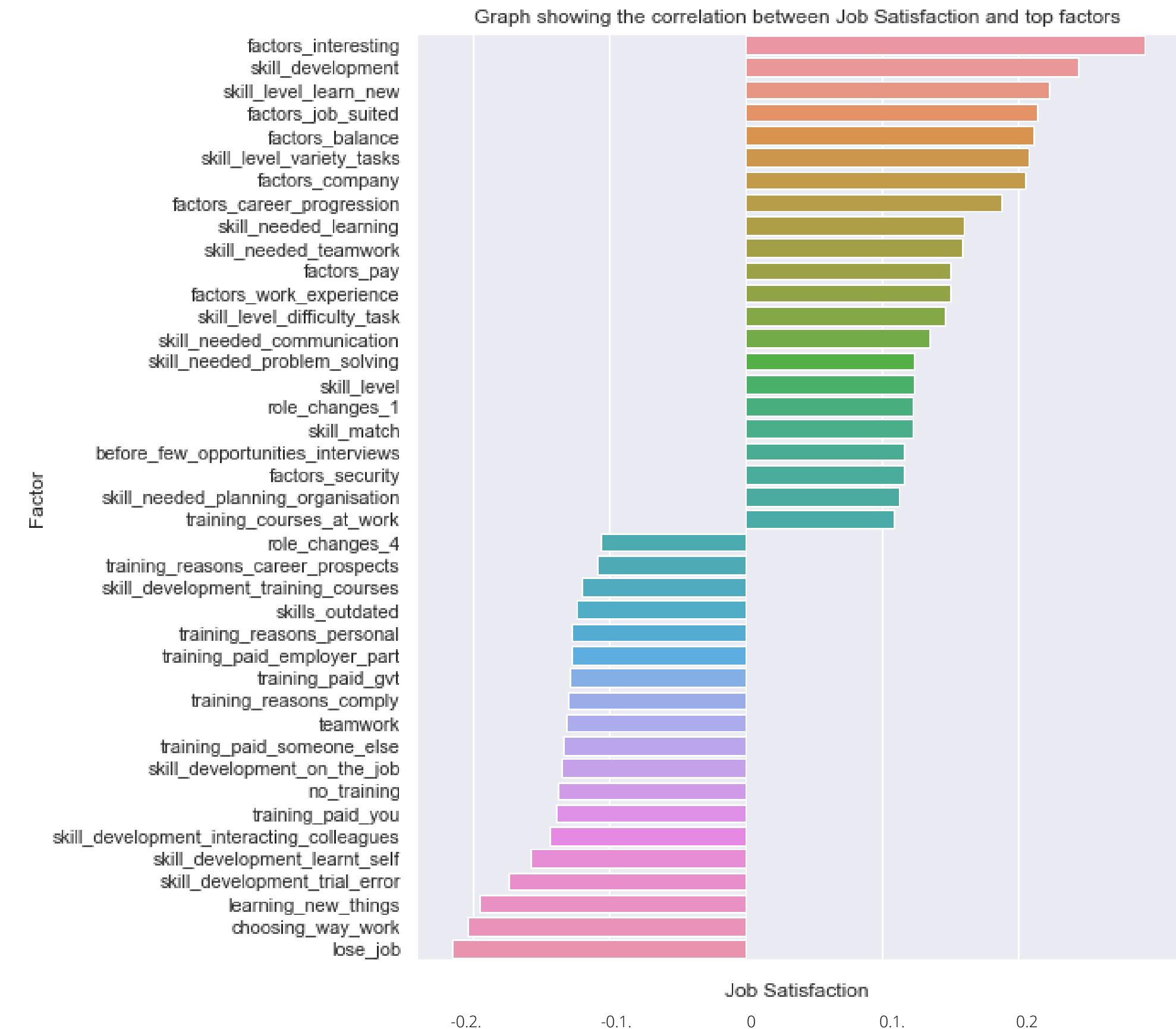
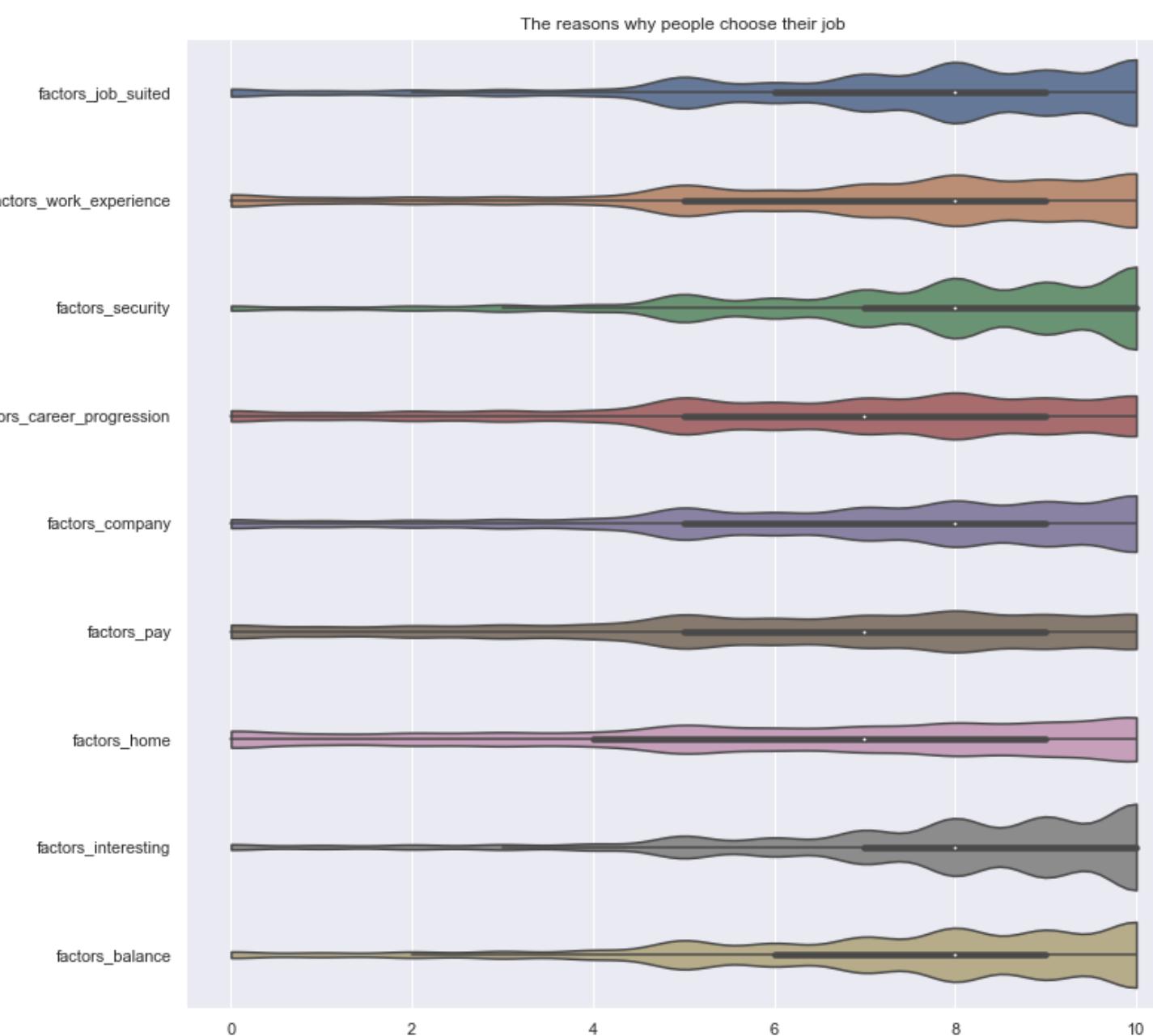
FARMER

Happiest Career

Data Trends



Data Trends



Target

Classification Problem

Very Satisfying - 0.686518

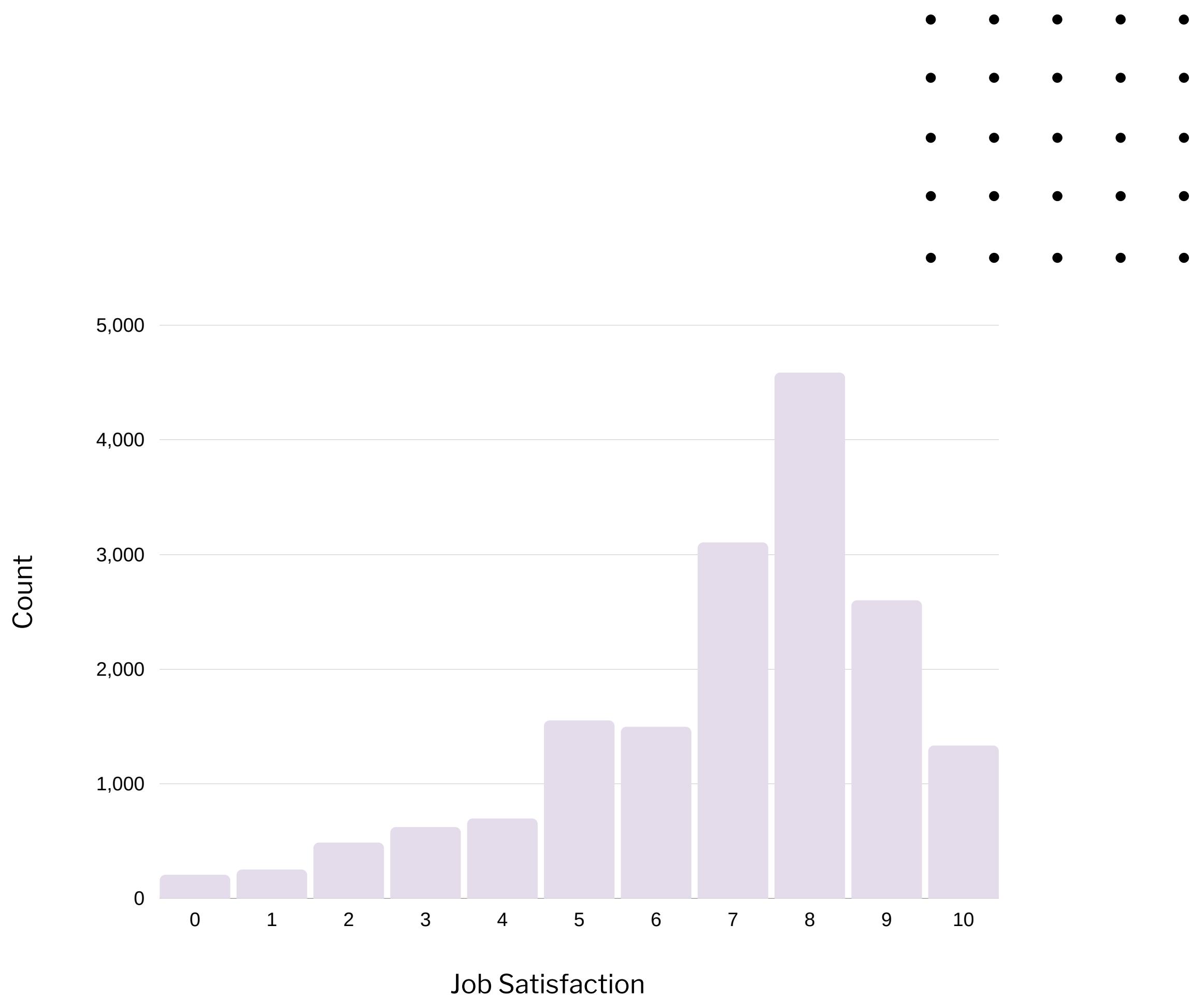
Somewhat Satisfying - 0.221139

Not at all Satisfying - 0.092343

Mean - 1.60

Median - 2.00

STD - 0.65

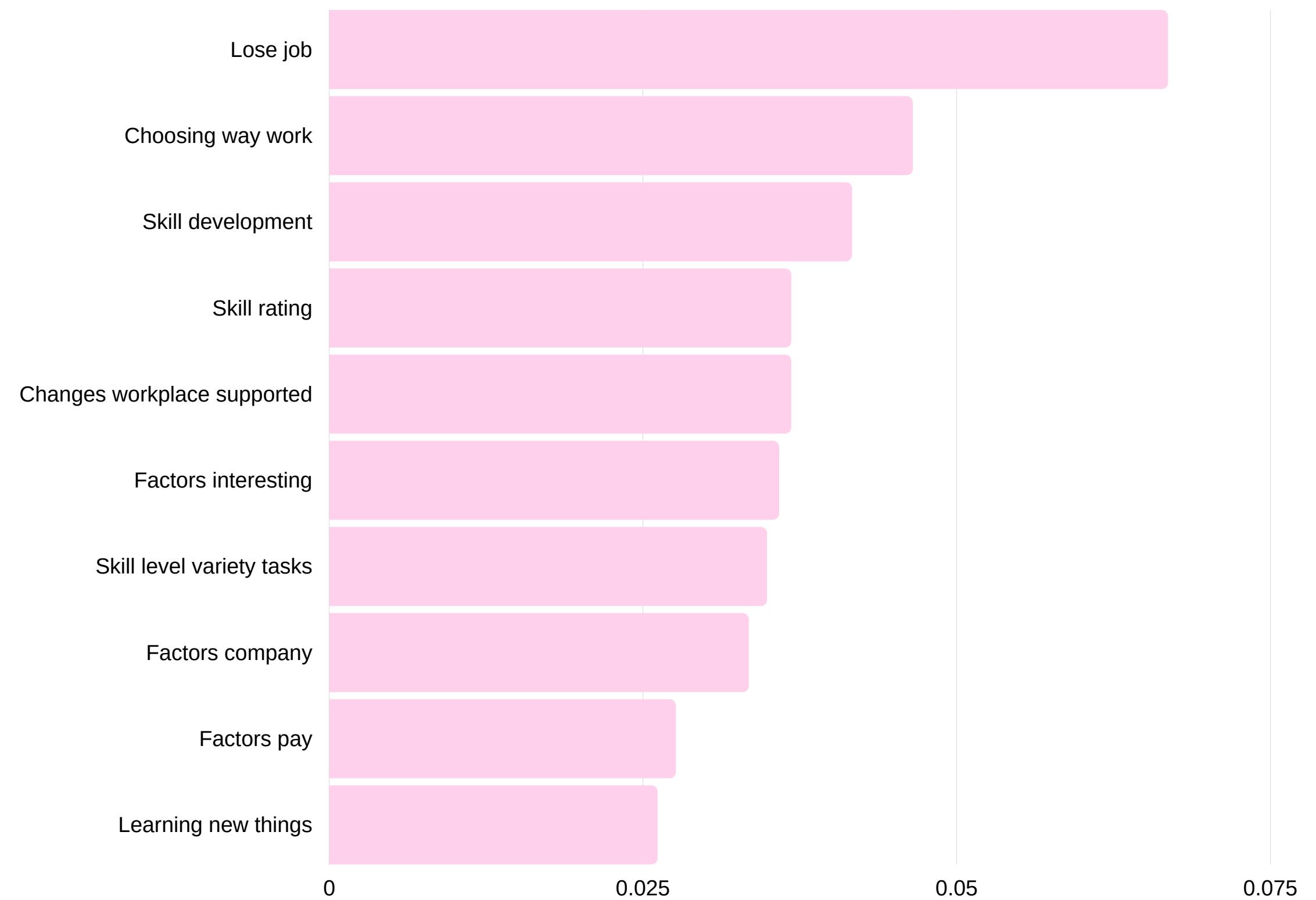


Hypothesis 1

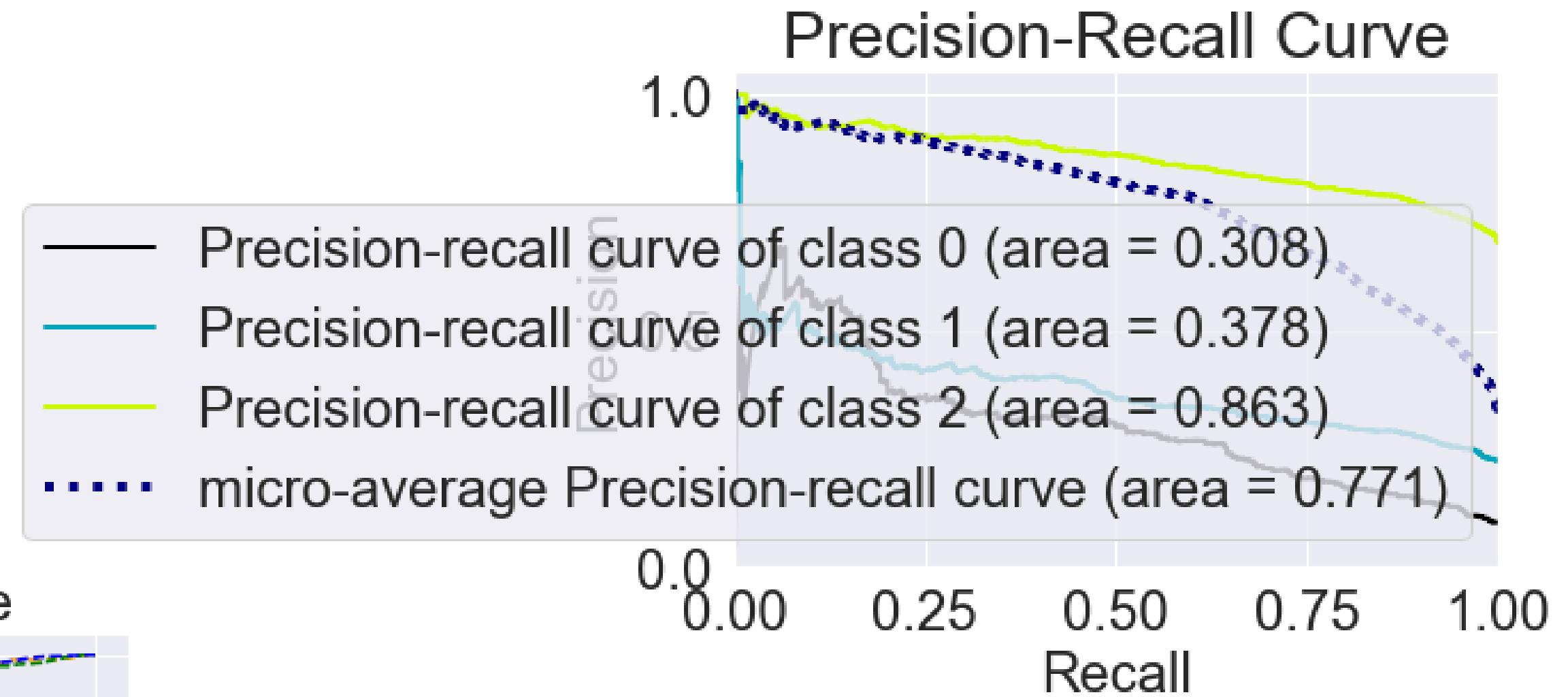
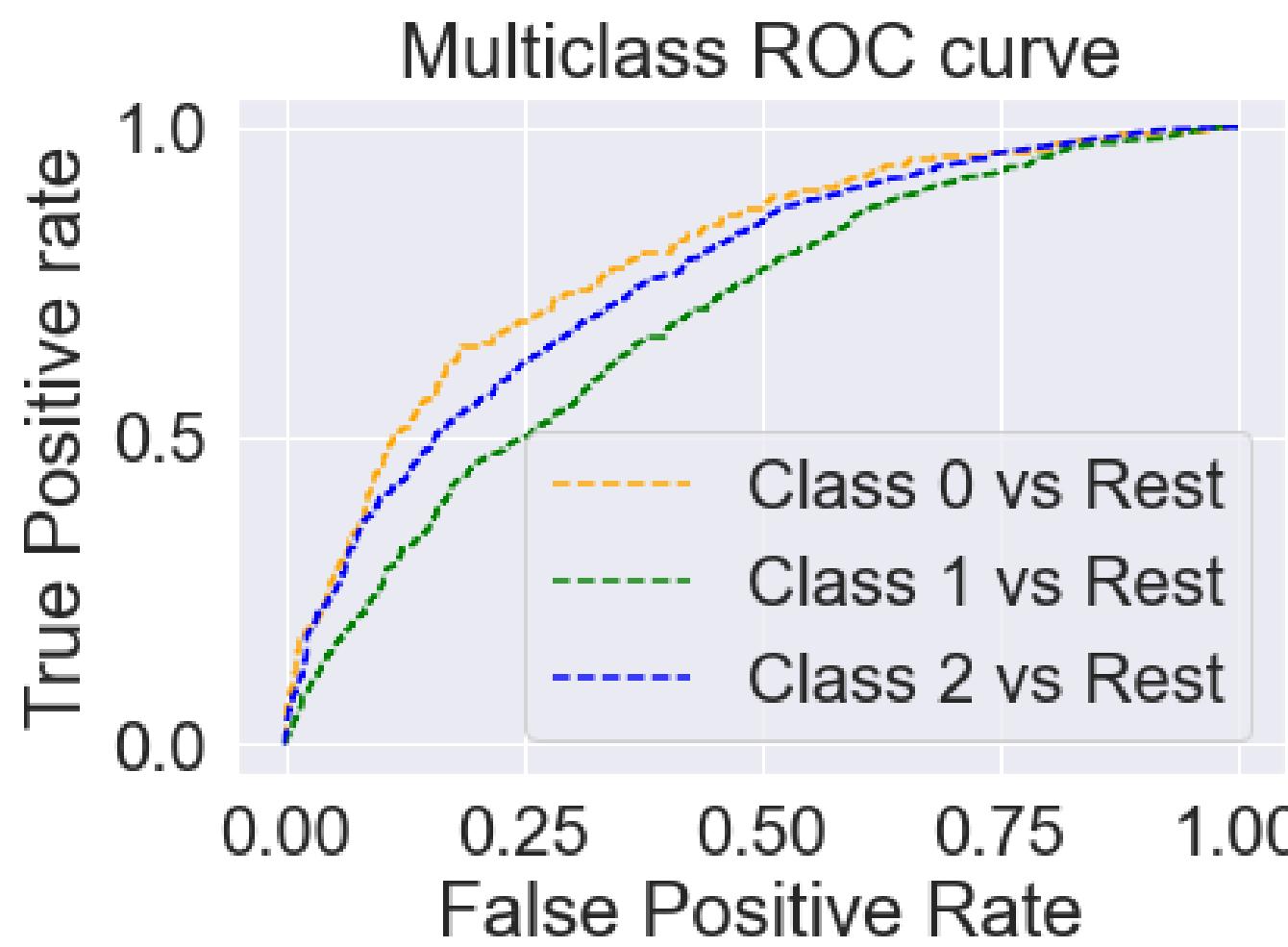
Baseline = 0.69

Model	Accuracy	AUROC	PR
Baseline Logistic Regression	0.71	0.7069	0.773
Logistic Regression with Lasso	0.71	0.7000	0.770
Logistic Regression with Ridge	0.71	0.7069	0.753
Grid Searched Logistic Regression	0.71	0.7059	0.774
Grid Searched Decision Tree	0.69	0.6178	0.692
Grid Searched Random Forest	0.70	0.6985	0.771
XGBoost	0.72	0.7237	0.785

Coefficients for XGBoost



Results for XGBoost

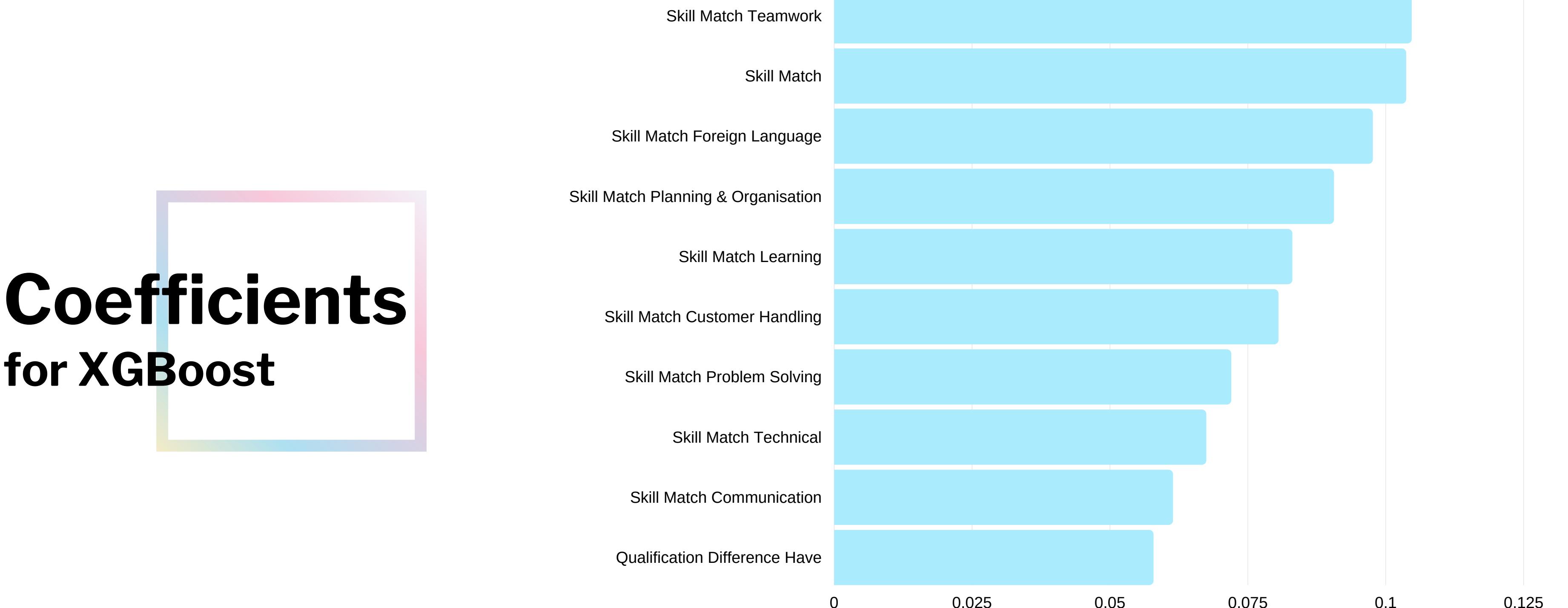


Hypothesis 2

Baseline = 0.70

Model	Accuracy	AUROC	PR
Baseline Logistic Regression	0.70	0.597	0.768
Logistic Regression with Lasso	0.70	0.597	0.695
Logistic Regression with Ridge	0.70	0.597	0.696
Grid Searched Logistic Regression	0.70	0.597	0.696
Grid Searched Decision Tree	0.70	0.565	0.664
Grid Searched Random Forest	0.70	0.609	0.710
XGBoost	0.70	0.612	0.709

Coefficients for XGBoost



Shortfalls

DATA ENGINEERING

The crude method of organising skills and qualifications into the five main areas noted for their link to skills mismatch in a role.

For example, if you trained to be a teacher and now work in teaching then that would be a match. However, you could have a biology degree and now work in teaching (as a biology teacher) and that wouldn't be a match.

OVERFITTING

Some models had a larger variation in terms of their test and train scores.

IMBALANCED DATA

Would a more balanced target variable work better?

Put it into action

CHOOSE A ROLE
THAT'S JUST BEYOND
YOUR SKILLSET

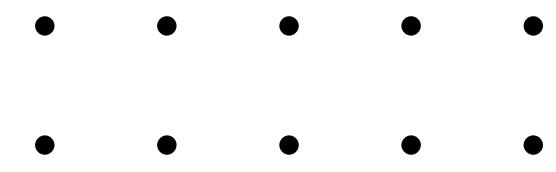
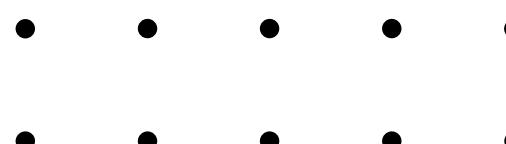
DON'T LOSE YOUR JOB

PICK A CAREER THAT
OFFERS VARIETY

CHOOSE THE WAY
YOU WORK

WORK WITH PEOPLE
OR OUTDOORS

DO SOMETHING
VOCATIONAL



Next Steps

NLP

Use NLP to identify more specific careers to enhance both hypotheses and improve the skills mismatch data. One issue with this might be a translation issue - answers were provided in a person's native language.

ADDITIONAL DATA

From other countries, years and cultures

HAPPINESS & PRODUCTIVITY

Explore the link between job satisfaction, wellbeing and productivity.

PCA

Identify trends, clusters and outliers in the data using PCA. PCA might help to further uncover relationships between observations and variables, and among the variables themselves.



Thank you!

ANY QUESTIONS?