UNICEF AND UNDP CASE COMPETITION

PEOPLE ANALYTICS
CONFERENCE 2020

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Introduction

Promotes the **rights** and **wellbeing** of **every child**, in everything we do

Advocate for **change** and connect countries to **knowledge, experience** and **resources** to **help people build a better life**

> *Does mobility have a positive impact on the individual's career advancement?*
>
> *Is the managed mobility system more beneficial than the other?*

An iterative 5 step process was undertaken to best answering the driving cases questions

- Understand the latent problem the organizations wish to solve
- Break down the problem into actionable sub-parts

- Identify the best model type for each tested hypothesis
- Incorporate additional features that may better reflect phenomena

- Extract actionable insights for UNICEF and UNDP
- Identify cautions and risks from model implications
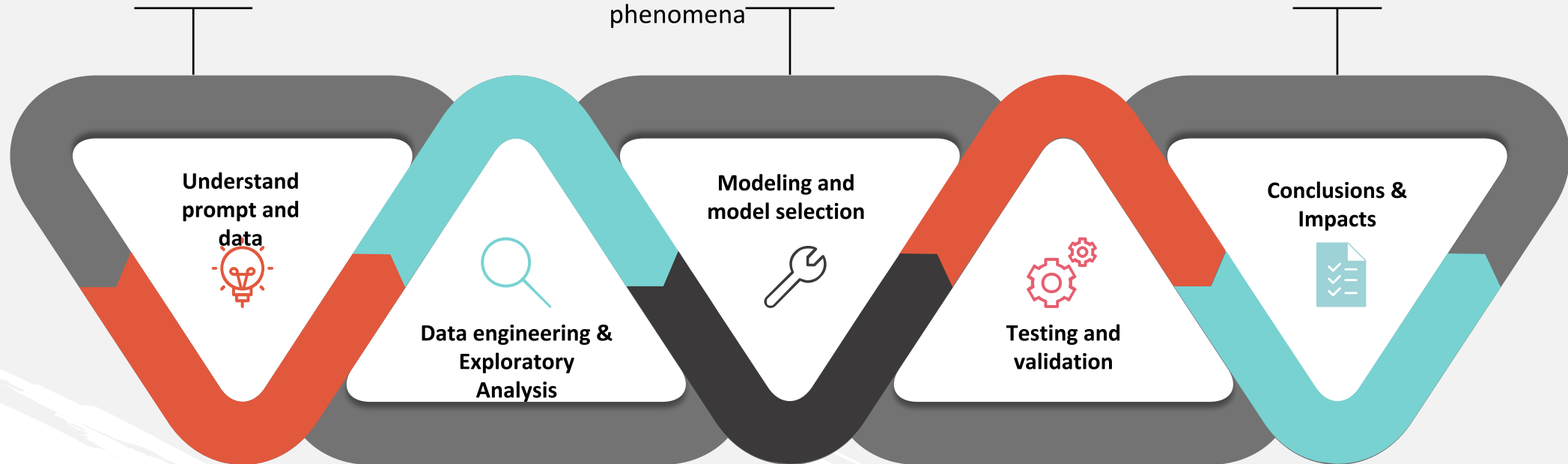
Understand prompt and data

Data engineering & Exploratory Analysis

Modeling and model selection

Testing and validation

Conclusions & Impacts

- Clean and simplify the data format
- Identify data trends to develop additional hypotheses
- Engineer features to best evaluate our hypotheses

- Prevent bias through cross validation
- Validate the performance of the models using a validation data set

Contents

A   **Driving Questions & Methodology**

B   **Hypotheses**

C   **Final Model, Implications & Recommendations**

UNICEF and UNDP's strategic questions for the conference can be broken down into 4 key questions to guide the analysis

1 **How should one define "Success"? What is "Mobility"?**

2 **Does "Mobility" lead to "Success"?**

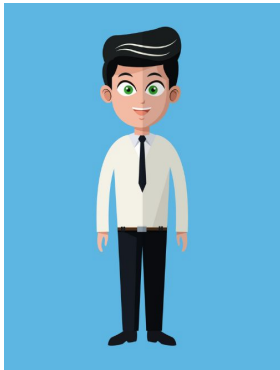**3** **What are the other key factors impacting "Success"?**

4 **Does the managed mobility system lead to more successful employees?**
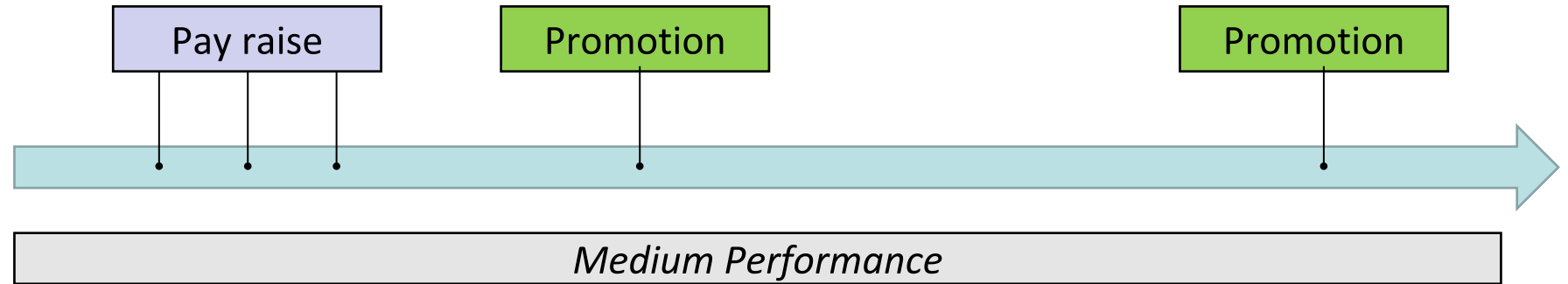
"Success" is a naturally unobjective measure to define
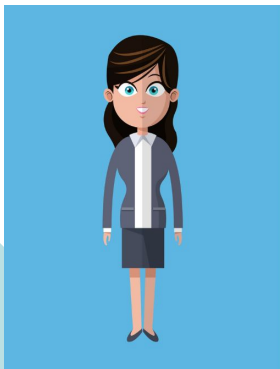
Who do we think is more successful?

John Smith

UNICEF
Male
40-49
US citizen
17 years of service

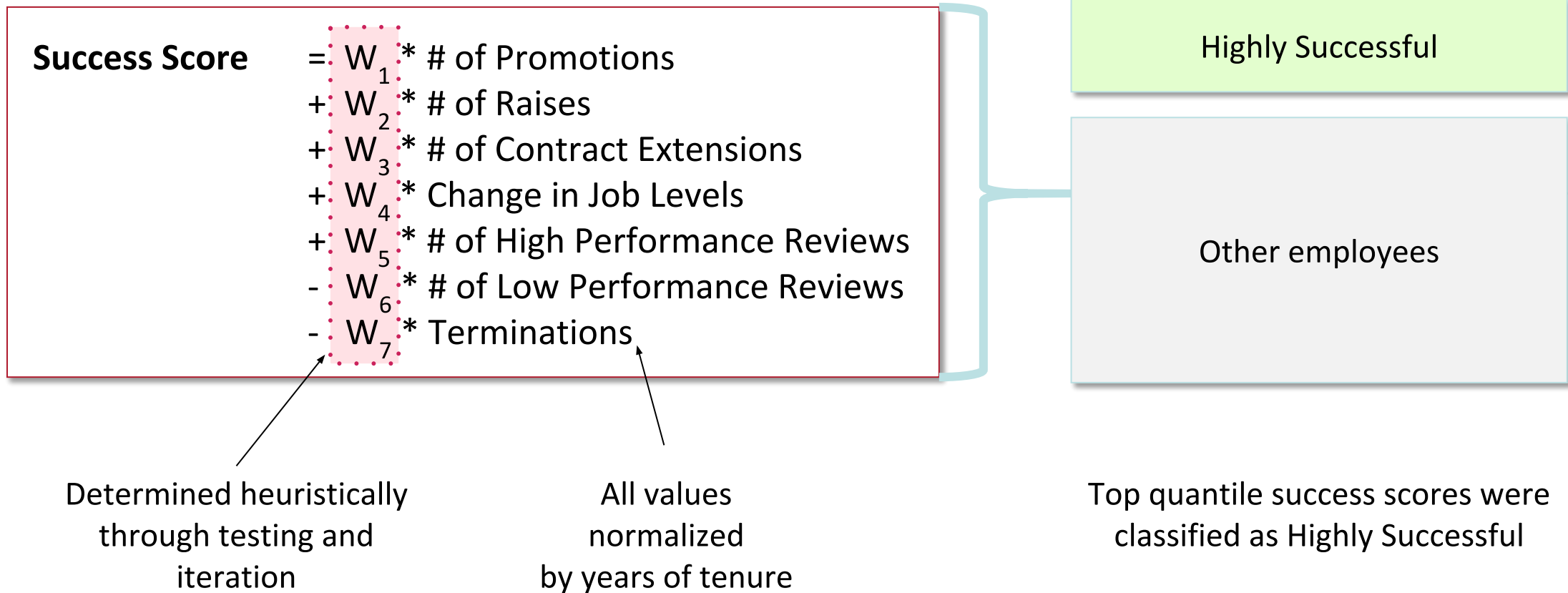| Pay raise | Promotion | Promotion |

Medium Performance

Jane Doe

UNICEF
Female
30-39
CA citizen
12 years of service

| Job Transfer | Pay raise | Promotion |

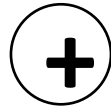*High Performance* | *Low Performance* | *High Performance* | *Low Performance*
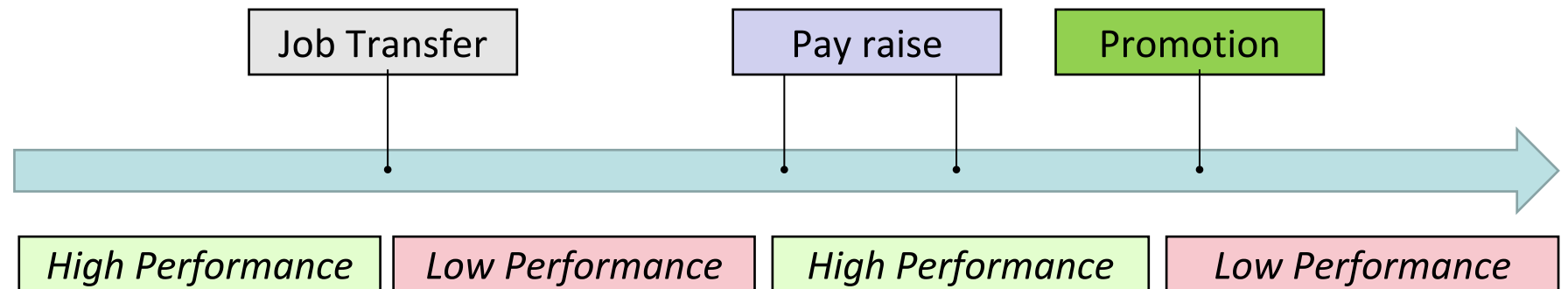
All drivers of success were combined into a single score to makes it possible to compare individuals across roles, firms, and time

Success Score $= W_1$ * # of Promotions
$+ W_2$ * # of Raises
$+ W_3$ * # of Contract Extensions
$+ W_4$ * Change in Job Levels
$+ W_5$ * # of High Performance Reviews
$- W_6$ * # of Low Performance Reviews
$- W_7$ * Terminations

Determined heuristically through testing and iteration

All values normalized by years of tenure

Highly Successful

Other employees

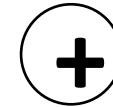Top quantile success scores were classified as Highly Successful

To predict success, Mobility and other factors were used as inputs into the tested models

Geographic Mobility		Functional Mobility		Other Factors
	+		+	

Geographic Mobility
- # of Cities
- # of Countries
- Location Hardness (Weighted by time)
- Min / Max Hardness

Functional Mobility
- # of Positions
- # of Organizations worked for
- # of Transfers

Other Factors
- Age Group
- Gender
- GDP per capita
- Continent of Nationality
- Years of Service

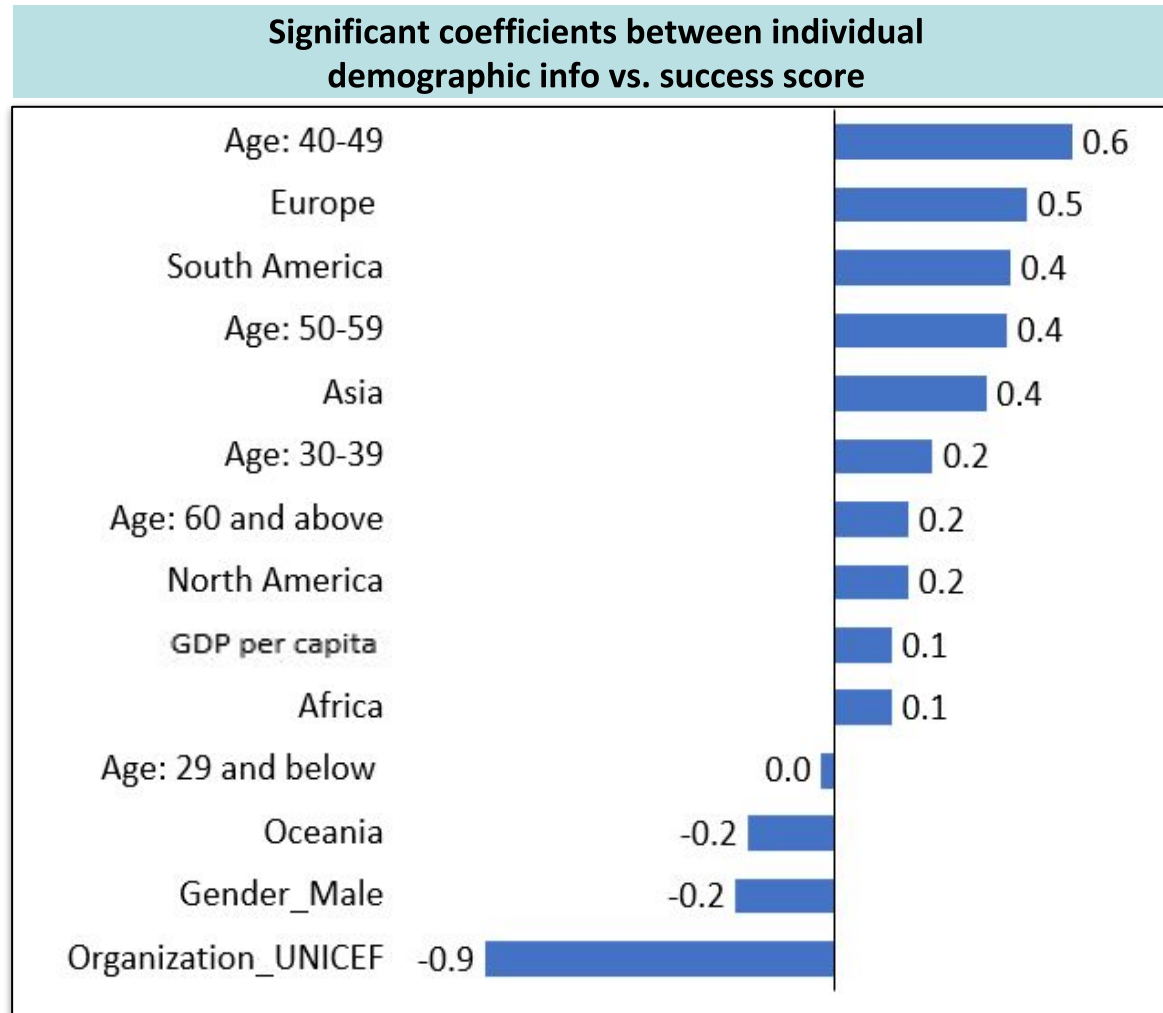# Hypothesis 1: **Individuals with higher mobility are more likely to find success in both organizations.**
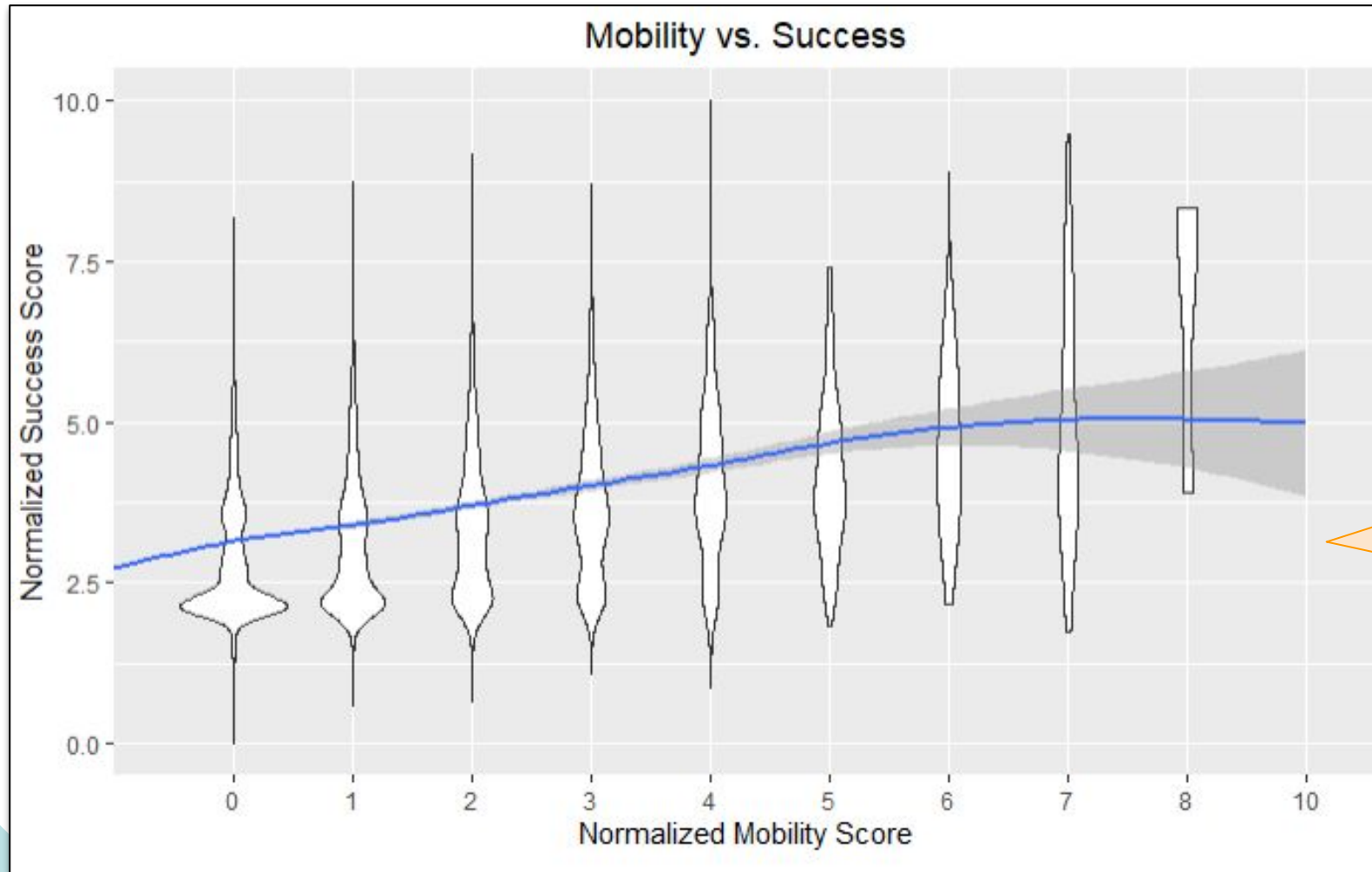
Plausible

There is a positive pattern between mobility and success for both UNICEF and UNDP

Hypothesis 2: **Other factors such as gender, age group are not correlated with success**

False

Significant coefficients between individual demographic info vs. success score

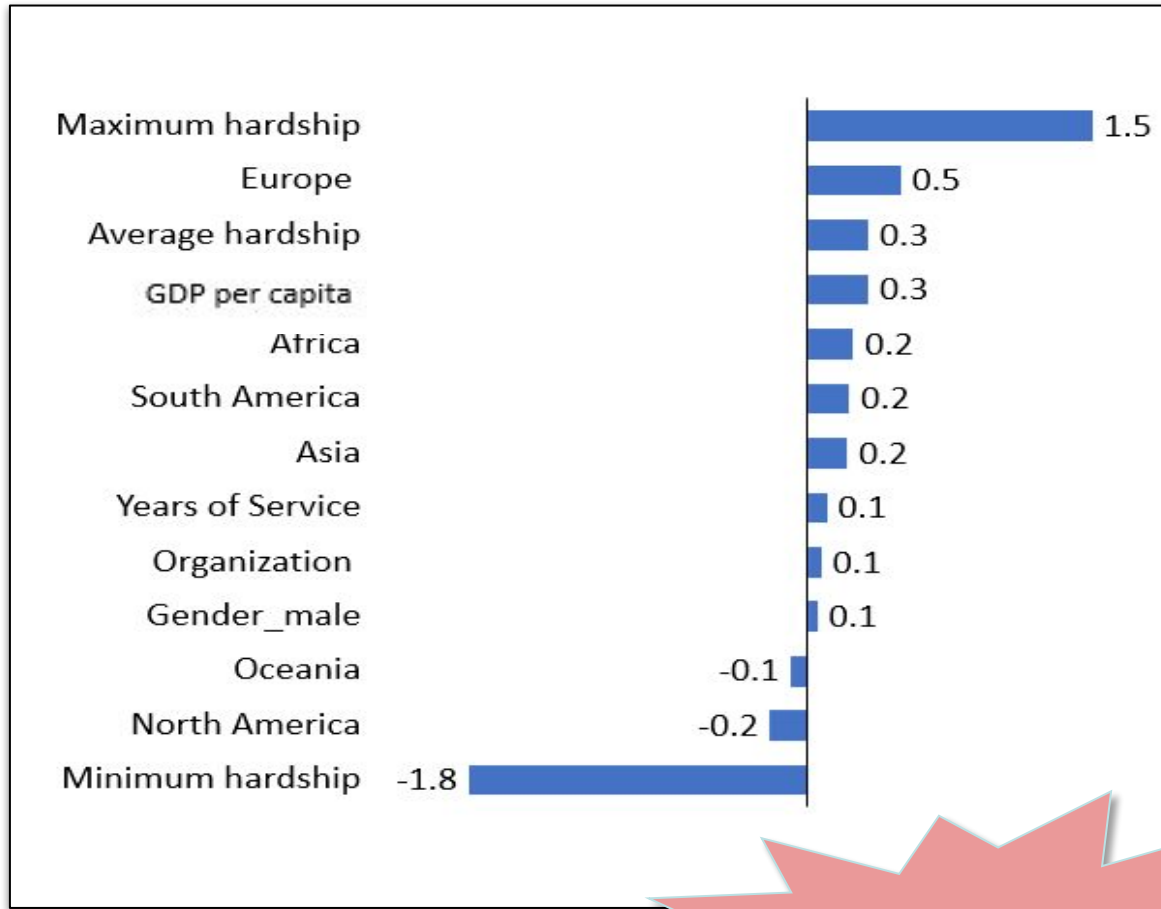| Factor	Coefficient
Age: 40-49	0.6
Europe	0.5
South America	0.4
Age: 50-59	0.4
Asia	0.4
Age: 30-39	0.2
Age: 60 and above	0.2
North America	0.2
GDP per capita	0.1
Africa	0.1
Age: 29 and below	0.0
Oceania	-0.2
Gender_Male	-0.2
Organization_UNICEF	-0.9

Implications:
All of the listed factors here are correlated to individual success score, including:
- **Gender**
- **Continent of nationality**
- **Age group**
- **GDP per capita of nationality (GDP per capita in home country)**

People in their **40s or 50s from Europe, South America or Asia** are more likely to succeed, assuming all else equal.

Hypothesis 3: **An Individual's mobility is predictable**

Significant coefficients between individual demographic info vs. success score

|	
Maximum hardship	1.5
Europe	0.5
Average hardship	0.3
GDP per capita	0.3
Africa	0.2
South America	0.2
Asia	0.2
Years of Service	0.1
Organization	0.1
Gender_male	0.1
Oceania	-0.1
North America	-0.2
Minimum hardship	-1.8

R square = 0.6

Plausible

Implications:
- 60% of mobility can be explained by factors such as **location hardship score, and their country of origin**

- Given enough information about an employee, we can determine how mobile they will be with a reasonable degree of accuracy

- People who has worked in hard locations are more likely to be mobile, while people who has been in easy locations are less likely to do so

Hypothesis 4: **Managed mobility system is more beneficial for individual success**

Unlikely
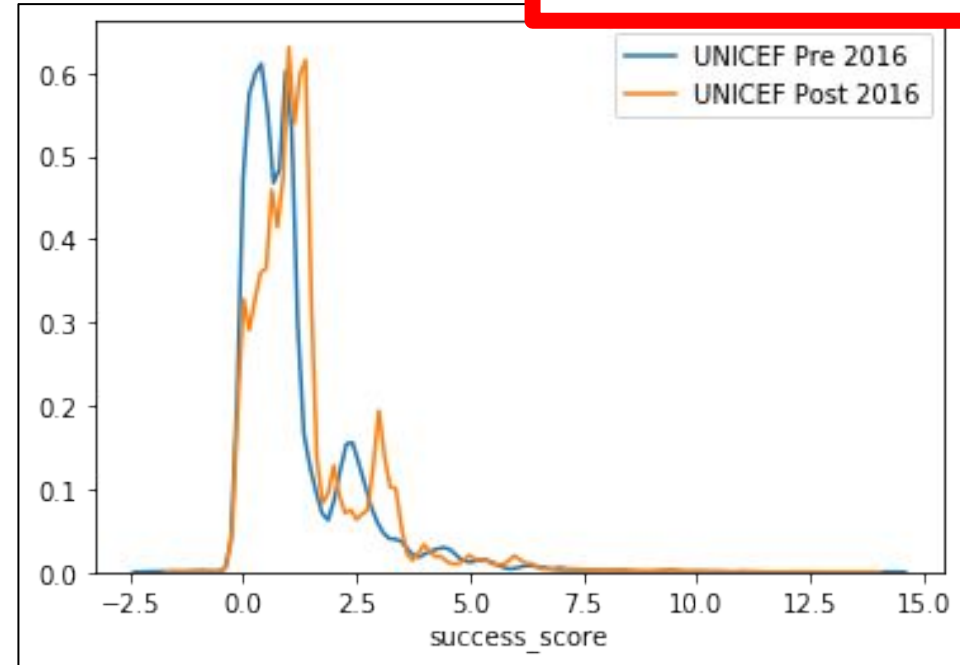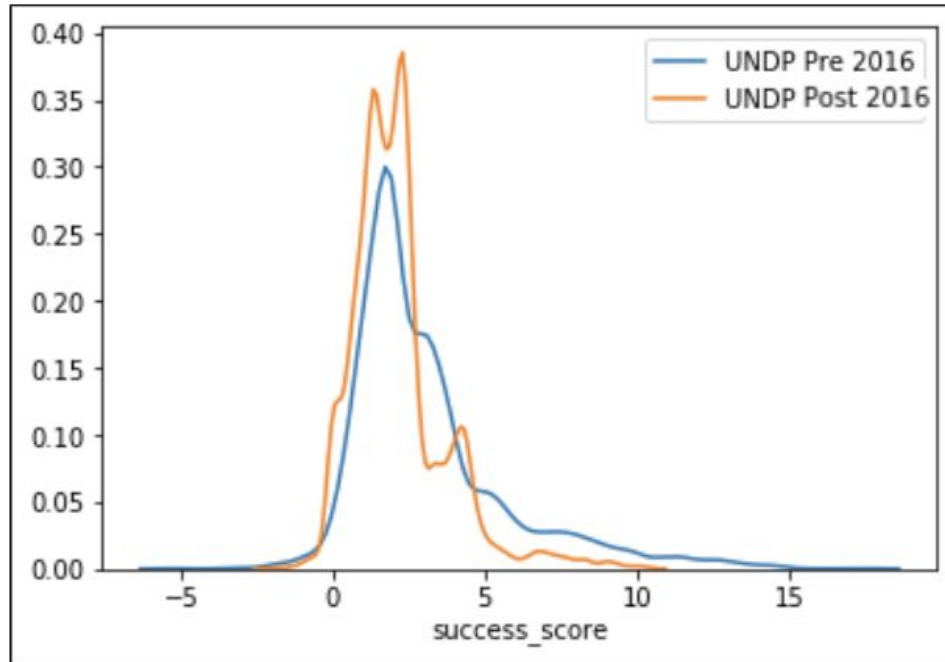
- Using the same success_score formula pre- and post- 2016, success_scores we plot out the distributions of the scores for the two organizations and the two time periods respectively
- For UNDP, where no managed mobility system was introduced, success_score does not noticeably move
- For UNICEF , where the managed mobility system was introduced, success_score does move, but negligible

Using everything we know about an employee, we can reliably predict their success
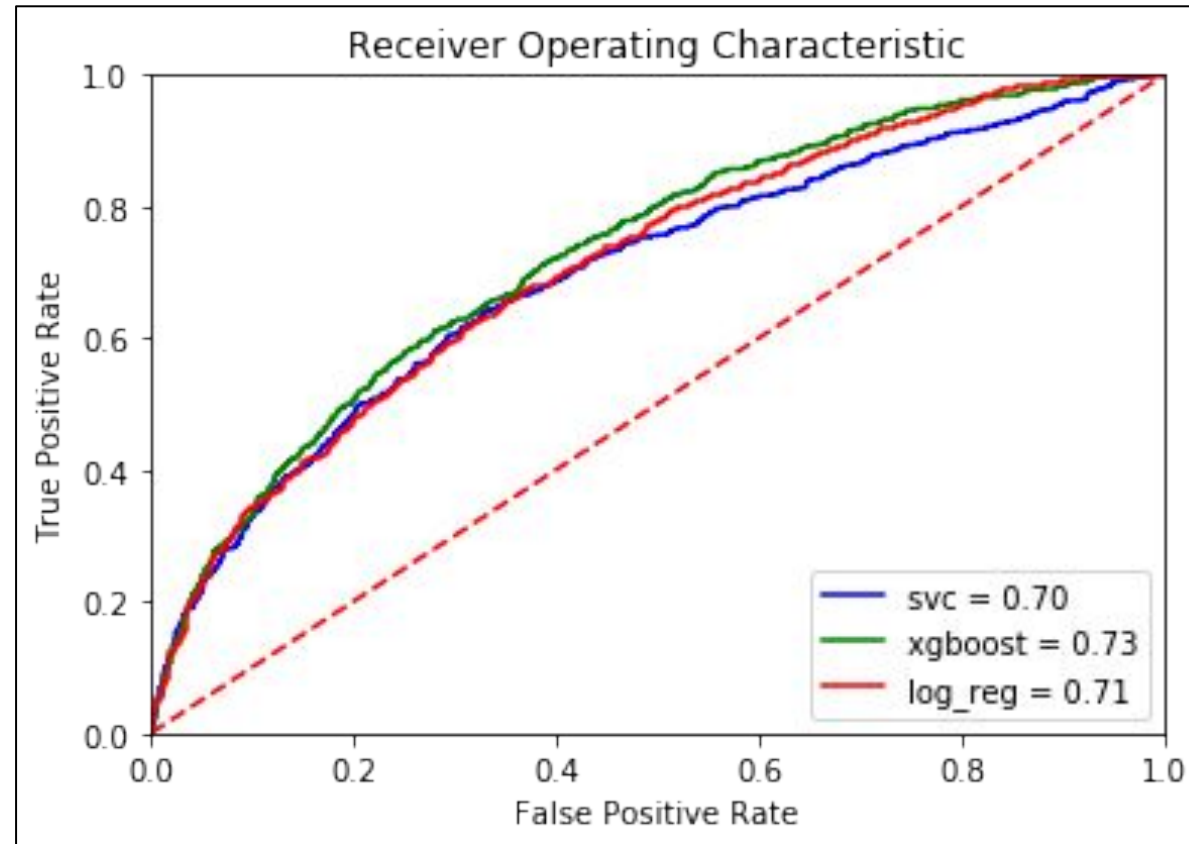
ACTUAL/ PREDICT	Precision	Recall	f1-score
MID + LOW	0.73	0.90	0.81
HIGH PERFORMER	0.62	0.33	0.43

Knowing an employee's mobility does not increase the ability to predict their success
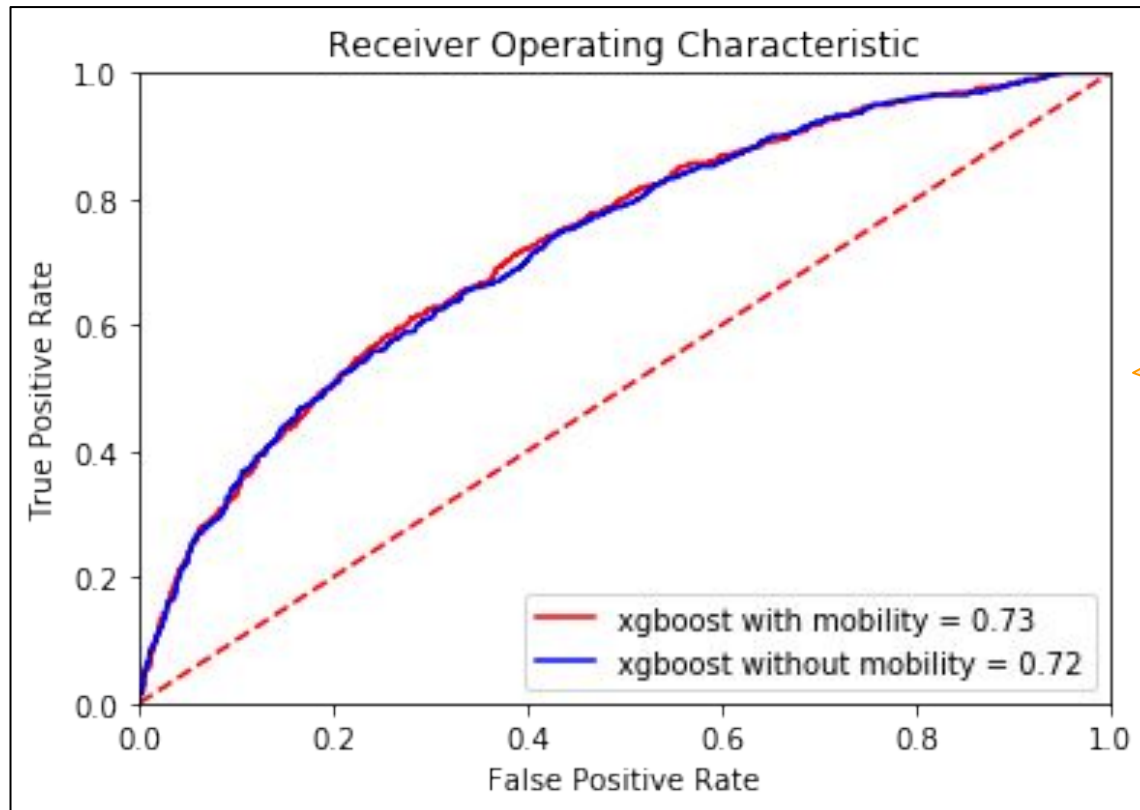
With low predictive power, all else being equal, increasing an employee's mobility does not make them a more successful individual

Model	F1
Base (Other)	.72
Other + Mobility	.73 (+.01)

Summary of Final Model

- **Mobility on its own <u>does not</u> appear to directly improve the career success of employees at UNICEF or UNDP**
  - While there is a slight correlation between mobility and success, upon further review, when success is regressed on other factors they are much better at predicting success
  - In particular, GDP per capita and age group are highly predictive of an employee's success at UNICEF or UNDP
  - Further, mobility is highly explained by these other factors, implying that mobility is a mediating variable and doesn't convincingly contribute to success

- **The Managed Mobility System <u>does not</u> appear to influence the mobility or success of individuals**
  - Since the Managed Mobility System's introduction in 2016, there has been a moderate increase in the mobility of UNICEF employees
  - However, there is no evident that the increased mobility lead to more successful individuals in the UNICEF, comparing both with before 2016 and with UNDP

Implications & Recommendations

- **Engage in and begin to collect employee sentiment and informal performance data on a regular frequency.** With a key predictor for employee success being tenure, ensuring your employees are happy and meeting their goals is a simple way to improve the success of any employee within the organizations

- **Be careful of biases in how promotions and performance ratings are being administered.** Findings in the data illustrate that employees from specific regions/continents, in general obtain lower performance ratings compared to peers from other regions/continents. While this could be a talent rating issue, more research is needed to fully understand if the issue is related to the rating alone or something more systematic. Ensuring a fair and equal playing field will ensure UNICEF and UNDP are getting the most from all employees.

- **Share the burden of work in hard countries to bring further appreciation for the role.** Employees working in a high hardness rating, were significantly higher than their peers to be mobile. These employees wanted to move out of these roles quickly, compared to their low hardness colleagues who liked to stay where they were. By rotating employees out of these roles you can create more equity across individuals and prevent unnecessary attrition of star employees

THANK YOU