

# Behind Closed Doors: Gendered Patterns of Unpaid Labor in the U.S.



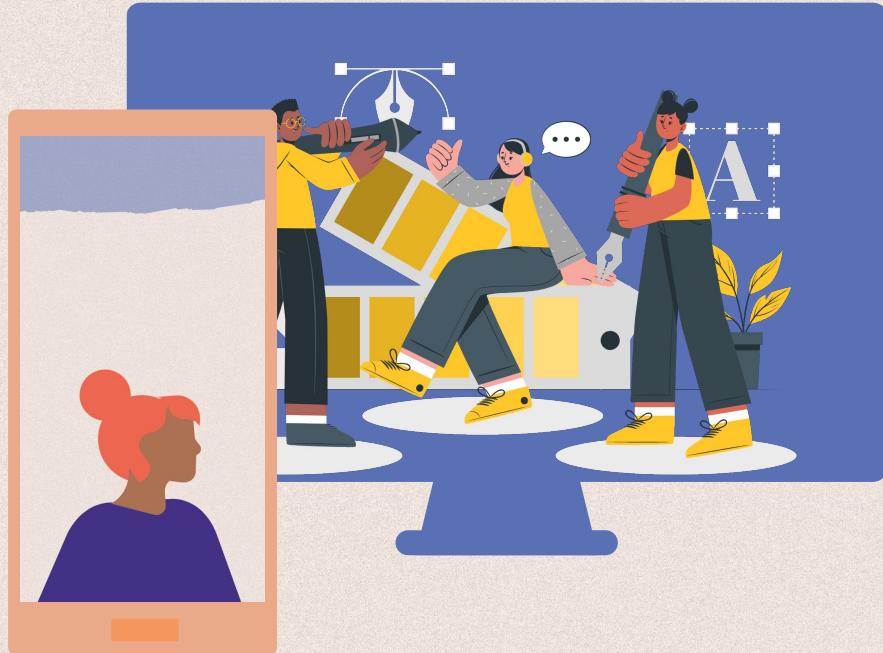
**Fatemeh Amirian**  
**Professor Salini**  
**May 2025**



“There is no such thing as a woman who doesn’t work.  
There is only a woman who isn’t paid for her work.”

**Caroline Criado-Perez**

# Disclaimers And Origin



# Table of contents

01

## Concept

What does Invisible labor mean?

02

## Data

Getting to know the data

03

## Patterns

Do people fall into similar groups based on how they spend their time?

04

## Predictions

How do our variables affect the unpaid labor and can we predict it?

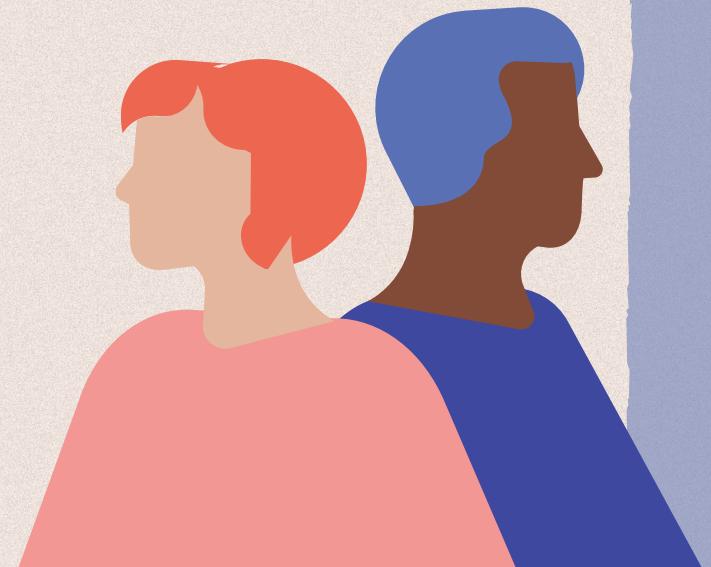
01

# Theory lesson



# When does labor become invisible?

**Unpaid labor** refers to services performed for one's own household without financial compensation that are economically productive and could be outsourced to the market. This includes tasks such as cooking, cleaning, childcare, home repairs, and grocery shopping activities for which a paid substitute could reasonably be hired. These tasks are excluded from traditional labor statistics but represent substantial contributions to household and economic functioning.



# Why does it matter?



## Societal norms

Unpaid labor reflects deep-rooted gender roles that still shape expectations at home.



## Stereotypes

Women's time is assumed to be flexible and available, masking the true cost of invisible work.



02

# The Data



# ATUS

American Time Use Survey



**8548**

**43**

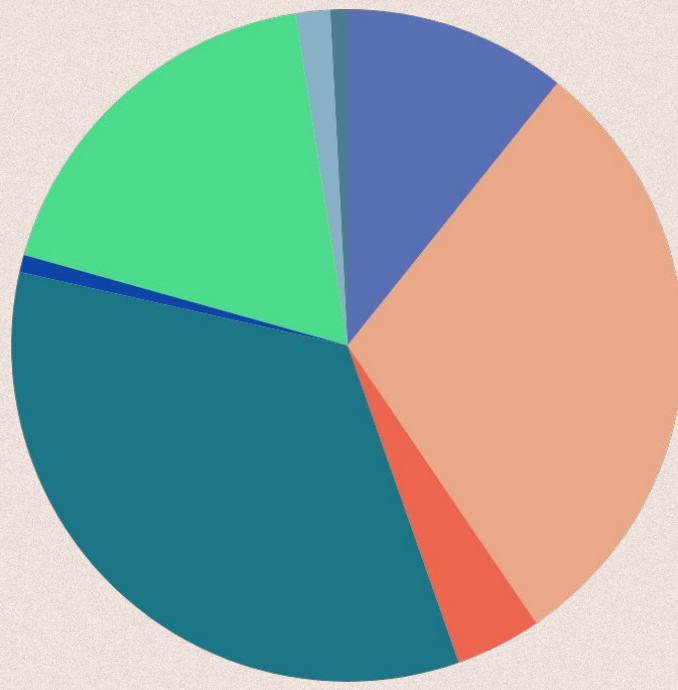
**Focus:** Time spent on daily activities  
across gender, income, employment,  
family structure

# Variables

Demographic - c	Demographic - n	Time use
<ul style="list-style-type: none"><li>• Race</li><li>• Gender</li><li>• Marital Status</li><li>• Presence of Children</li><li>• ...</li></ul>	<ul style="list-style-type: none"><li>• Age</li><li>• Salary</li><li>• Number of Children</li><li>• Usual Working Hours</li><li>• ...</li></ul>	<ul style="list-style-type: none"><li>• Communication</li><li>• Personal care activities</li><li>• Socializing</li><li>• Working</li><li>• ...</li></ul>
Help identify social roles and household context	Capture structural and economic background	Show how people allocate time across daily activities

# What does a full day look like?

- █ Unpaid Labor
- █ Leisure
- █ Socializing
- █ Education
- █ Personal Care
- █ Food & Drinks
- █ Communication
- █ Paid Labor



# How We Measured Unpaid Labor

## Household Activities

Includes tasks like cooking, cleaning, home repairs, pet care, and managing the household.

## Purchasing Goods

Time spent shopping for groceries, personal items, or using services like banking or medical appointments.



## Caring for Others

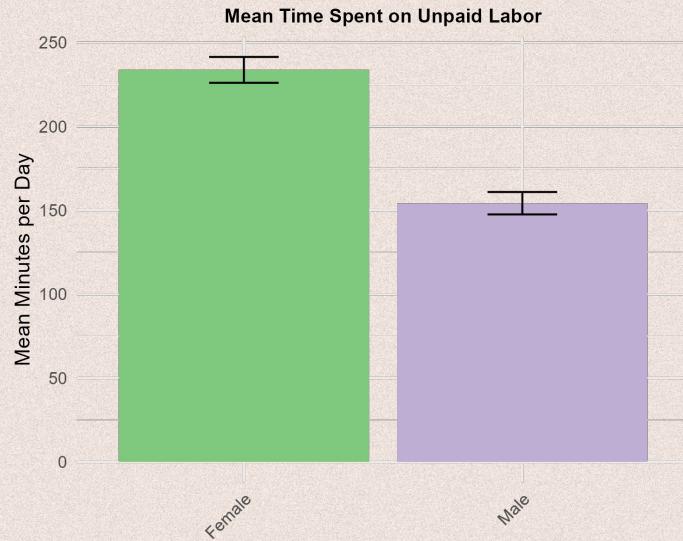
Includes childcare, elder care, and supporting both household and non-household members.

## Related Travel

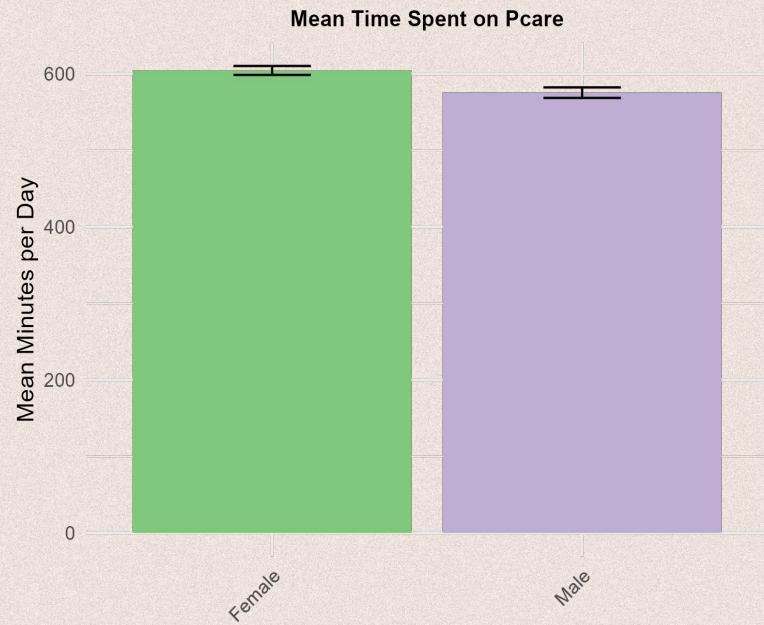
Covers all travel linked to household chores, caregiving, or shopping—often overlooked but time-consuming.



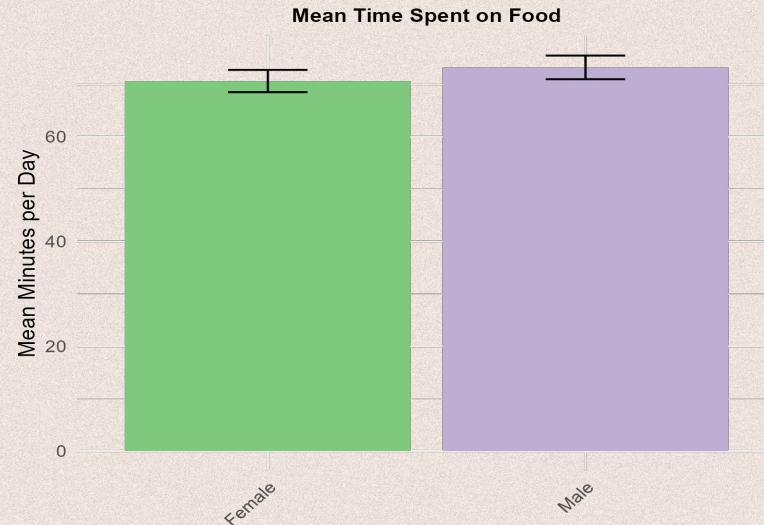
# Gender Gaps in Unpaid/Paid Labor



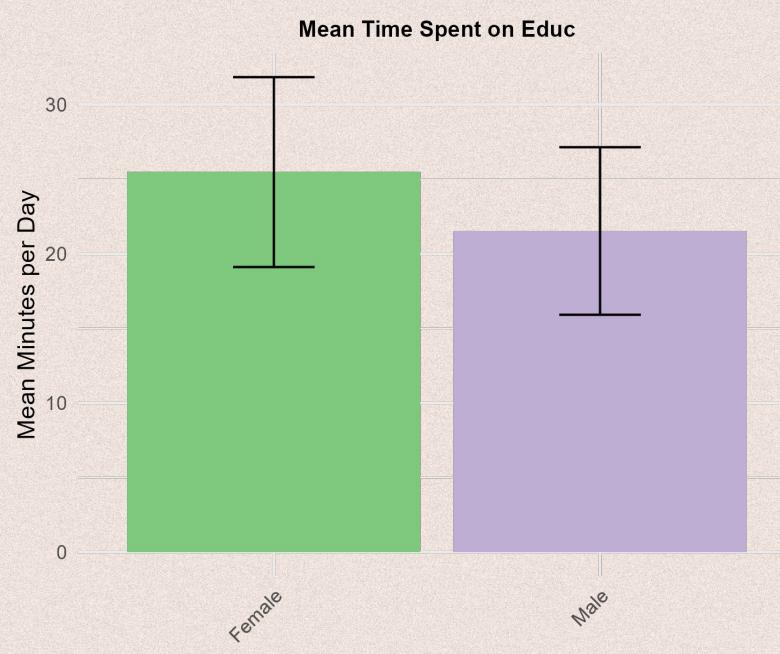
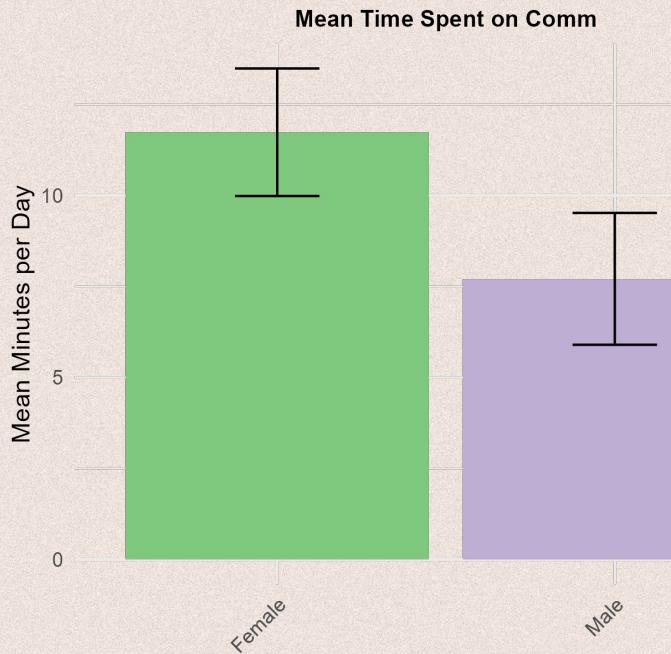
# Gender Gaps in Daily Activities - 1



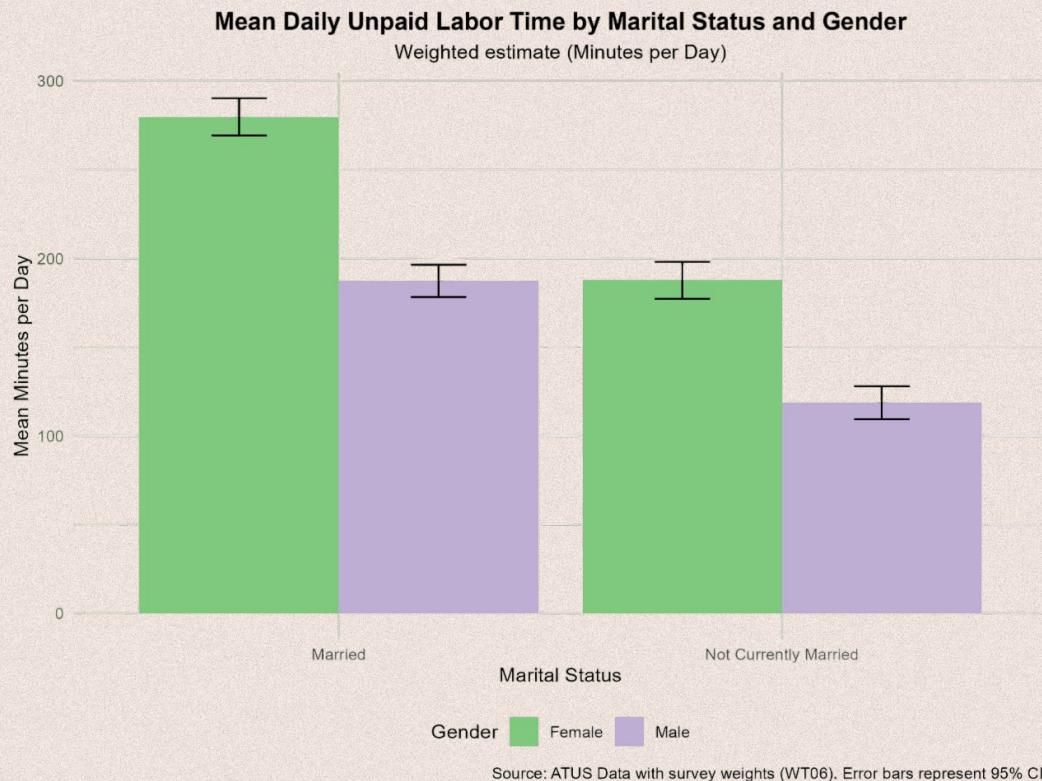
# Gender Gaps in Daily Activities - 2



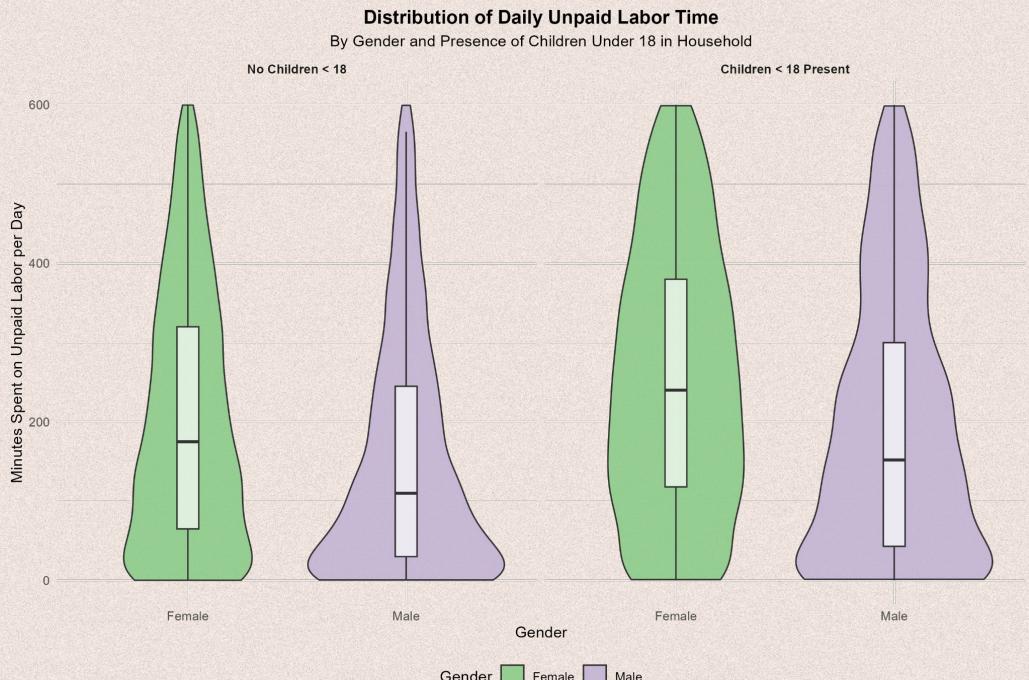
# Gender Gaps in Daily Activities - 3



# Marital Status



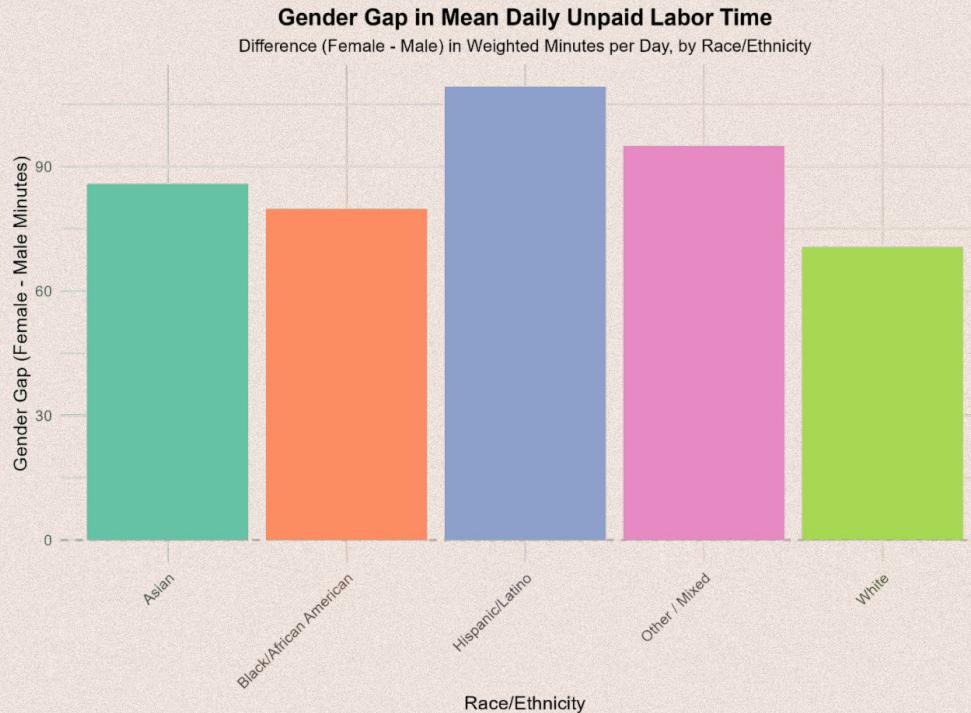
# Family Dynamics



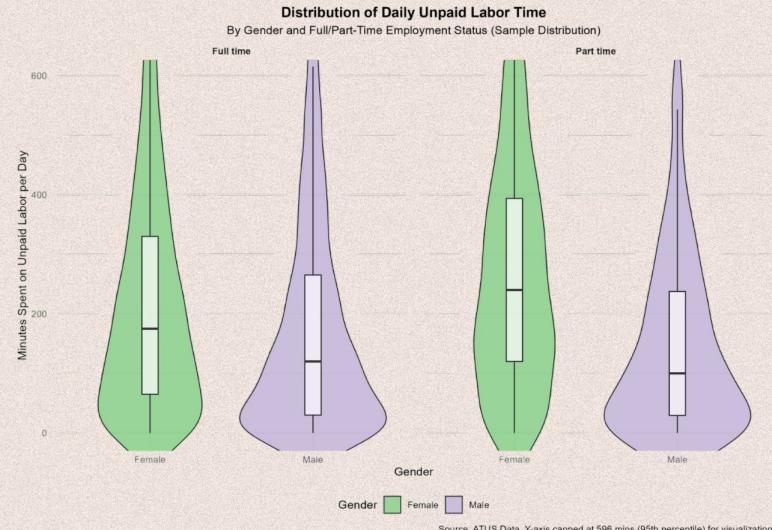
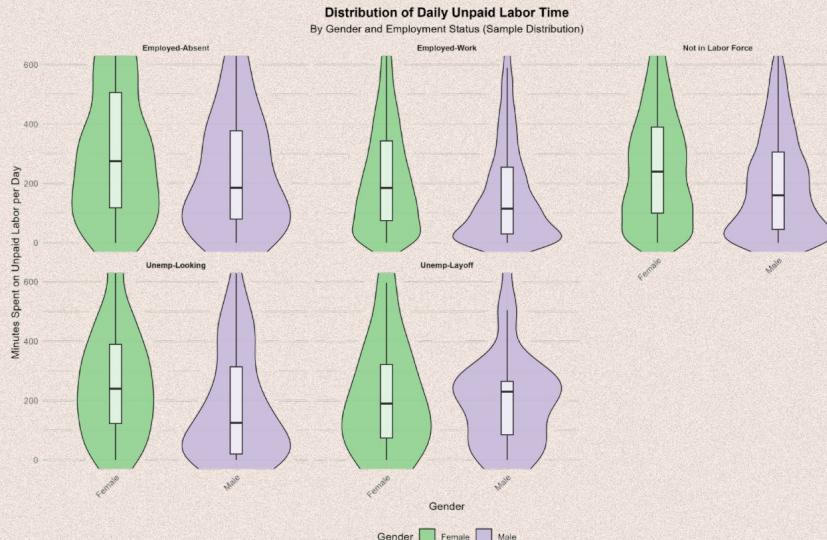
Source: ATUS Data. Y-axis capped at 95th percentile for visualization.



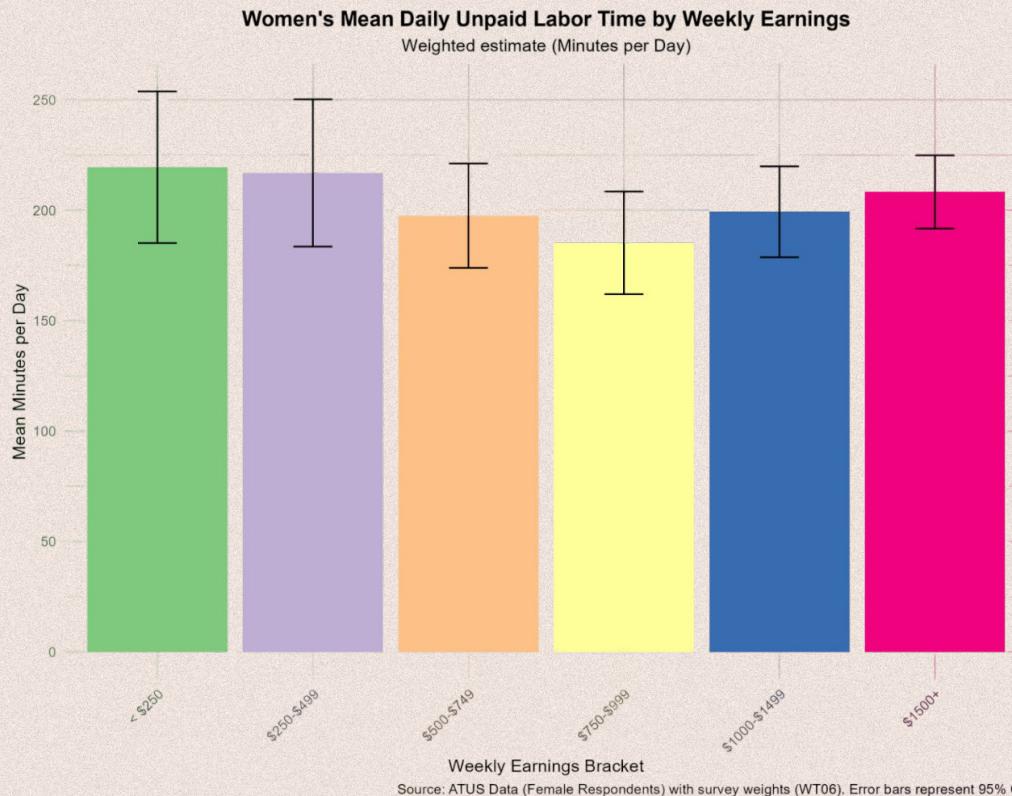
# Does race play a role?



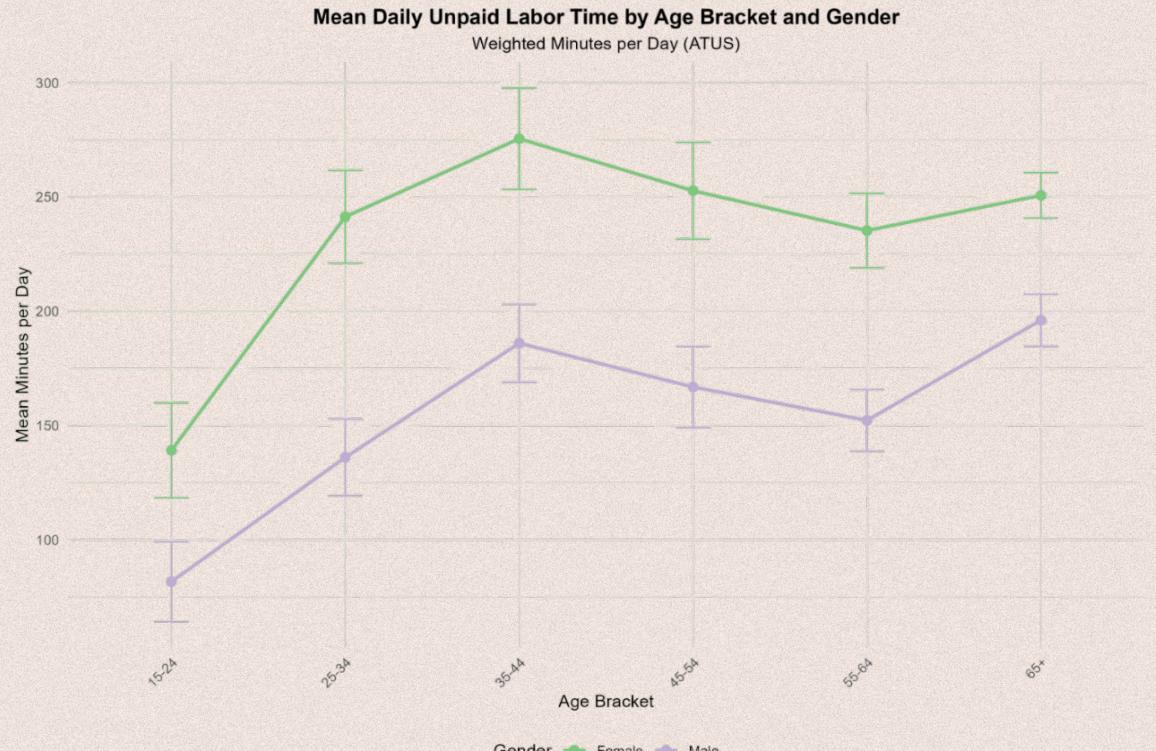
# Working Women - status and schedule



# Women's Financial Status



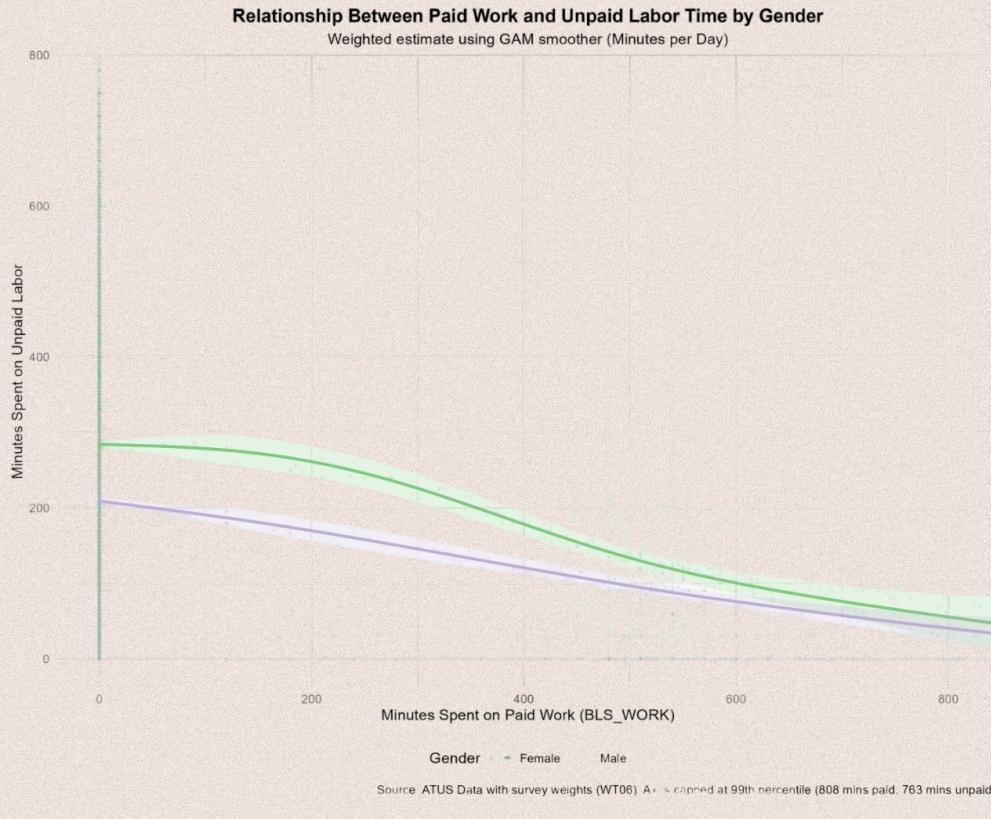
# Age



Source: ATUS data with survey weights (WT06). Error bars represent 95% confidence intervals.



# Who is the breadwinner?



03

# Is there any Patterns?

Spoiler: Yes but they are not perfectly distinct.

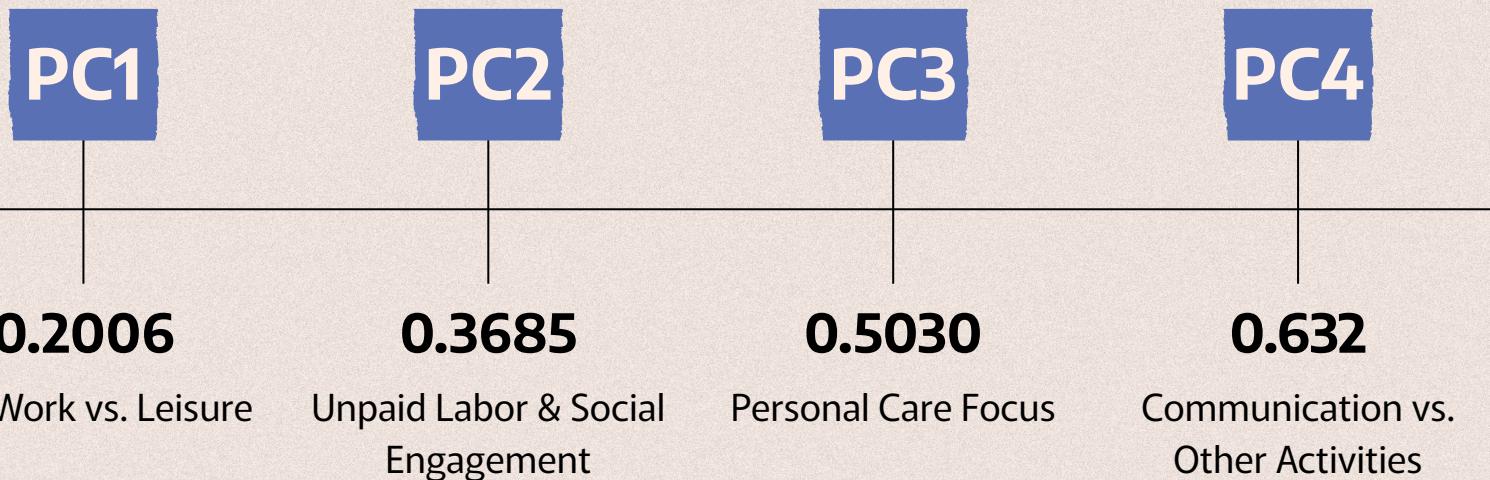


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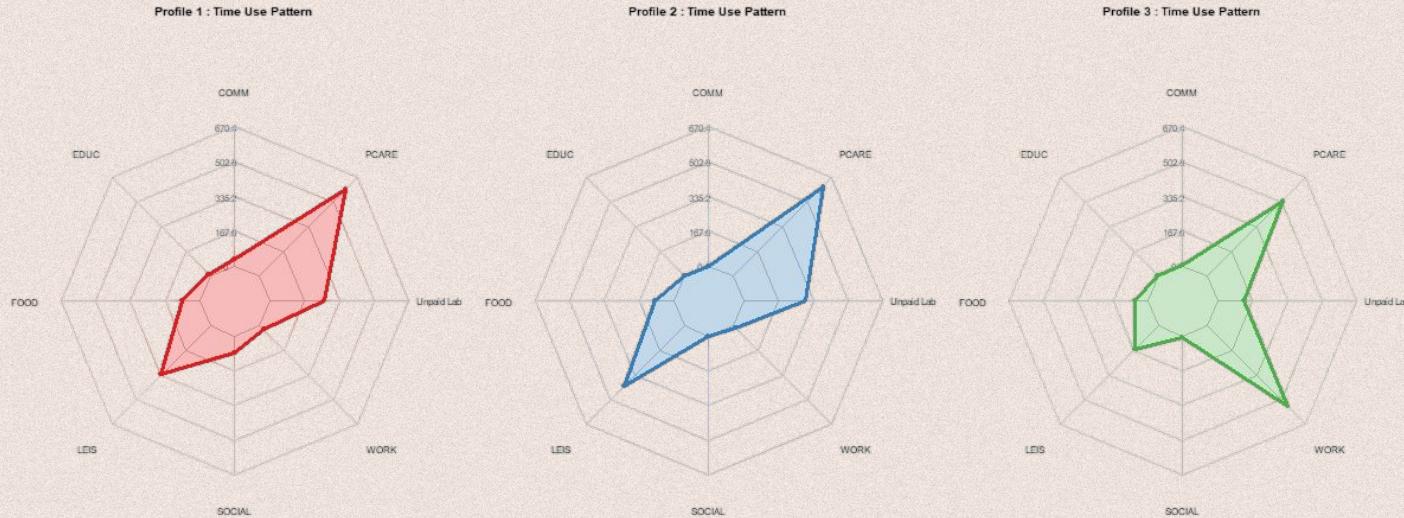
Partnered individuals in  
straight relationships



# **What are the key latent dimensions of couples' time allocation across work, domestic labor, and leisure?**



# Which distinct work-life balance profiles emerge among partnered individuals based on their daily time-use patterns?



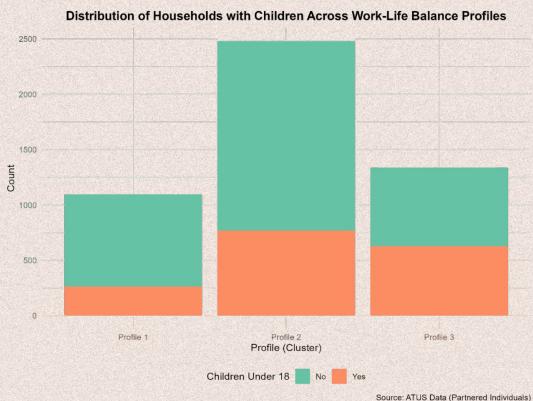
# **Clusters vs Demographic**

**What distinct patterns of gendered division of labor can be identified among couples based on time use?**

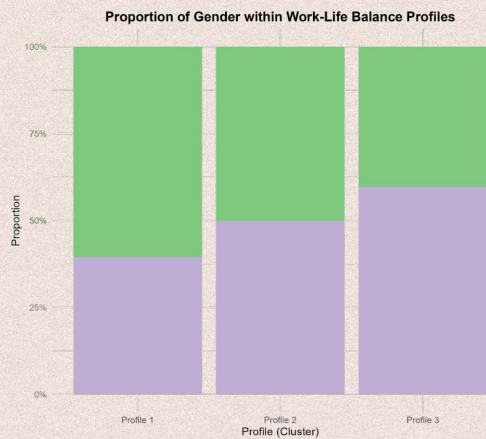
**How does household or family structure for example, having children influence couples' time-use patterns?**

**How does household economic situation influence work-life balance profiles?**

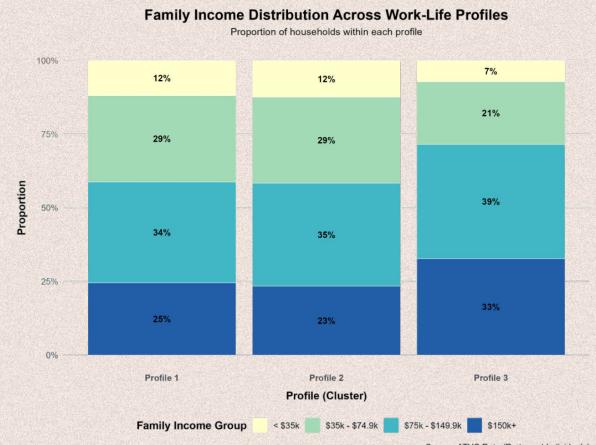
# Kids



# Gender



# Income



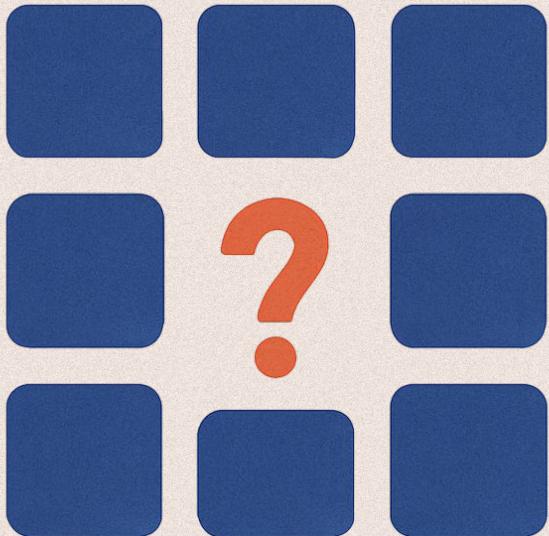
# 04

## Can we model a socio temporal concept?

Spoiler: Not really.



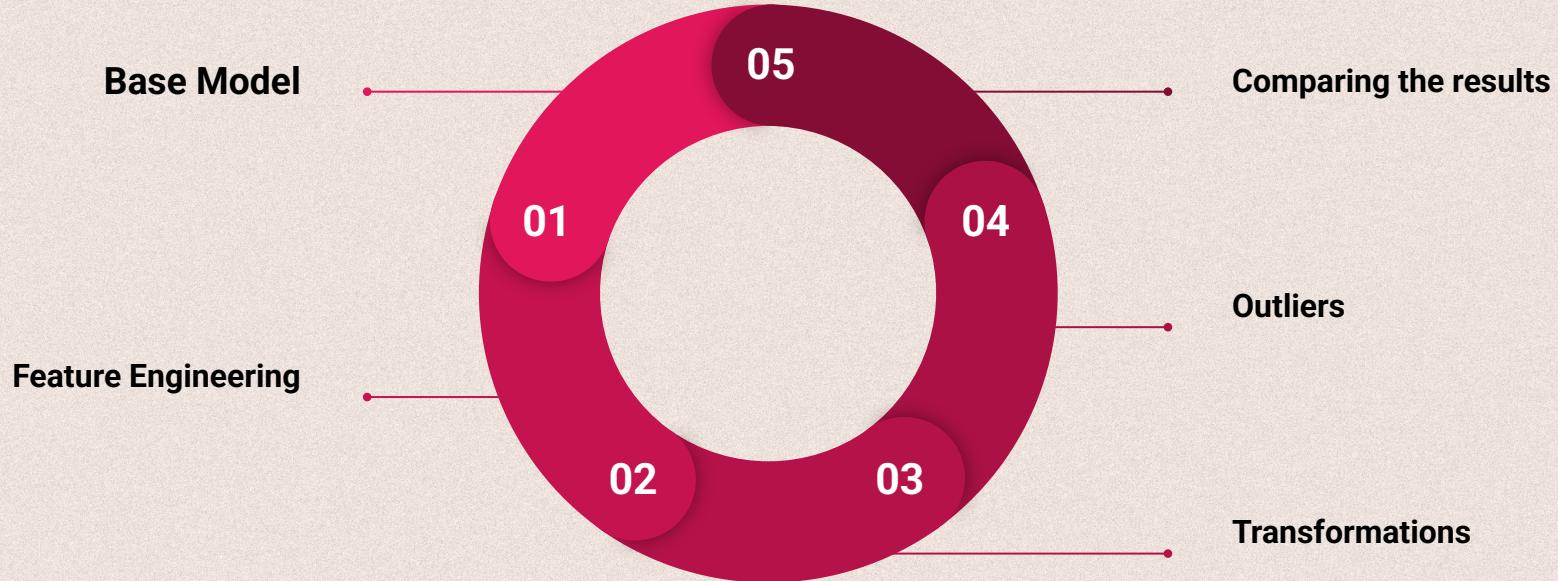
# Missing Value



- Code to Label
- Finding Real Missing Values
- Using MICE

# Multivariate Imputation by Chained Equations?

The `mice` package fills in missing values by using the information from other variables. It does this several times to create multiple complete datasets, helping to reflect uncertainty and improve the accuracy of the results.



# Model Comparison



Model	R Squared (pseudo)	Improvements %
Original	0.163	-
Enhanced Features	0.184	+ 2.08
Log Transformation	0.137	-2.62
Square Root Transformation	0.188	+2.47
95% Outlier + Sqrt	0.186	+2.3
99% Outlier + Sqrt	0.187	+2.4

# Is Even There any Inference?

- Yes and No!
- It depends on what we are asking.
- We can refer to our best model.



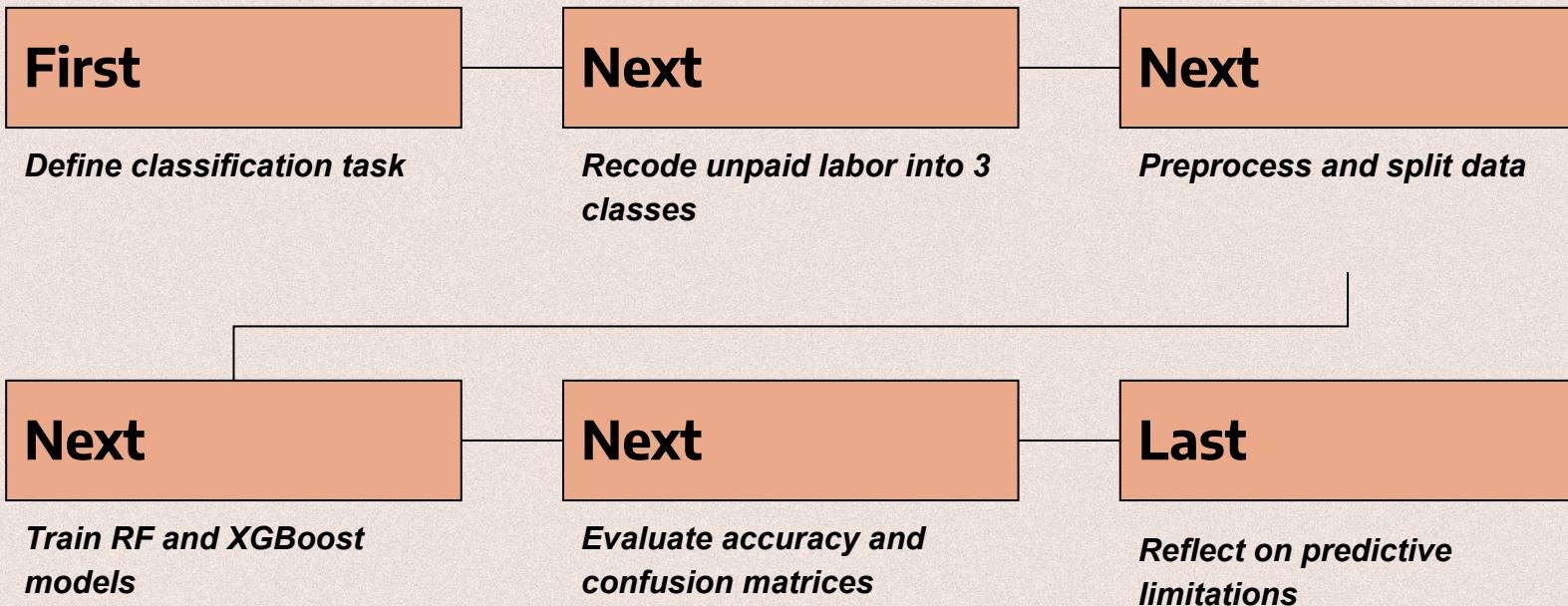
# Changing the Question

**Moving from inference to prediction**

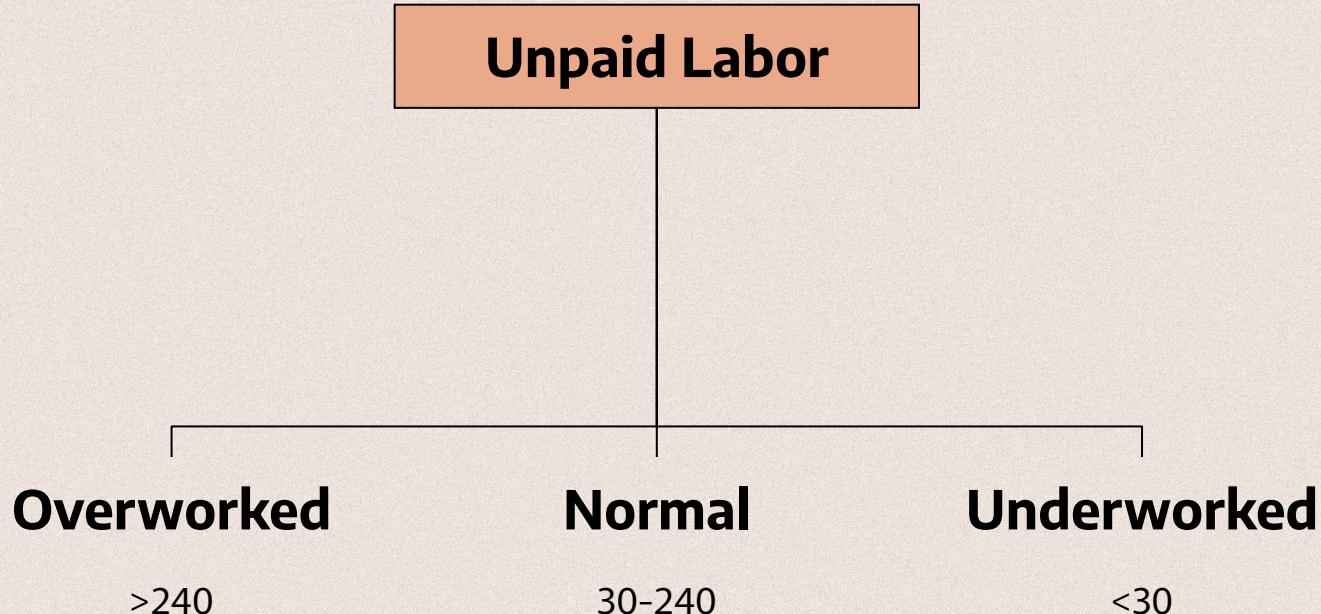
- . how?



# Sequence



# We need to classify



# Random Forest

Accuracy: 0.515

Prediction \ Reference	Normal	Overworked	Underworked
Normal	214	129	84
Overworked	177	294	60
Underworked	16	4	6

# XGBoost

**Accuracy: 0.523**

Prediction \ Reference	Normal	Overworked	Underworked
Normal	329	185	137
Overworked	257	459	80
Underworked	19	6	5

# **Limitations and Directions for Future Work**



# **Thanks!**