

Prediction of Depressive Tendency from Multidimensional Health Data Collected through Crowdsourcing

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Introduction

Over 300 million people suffer from depression in the world (5 million people in Japan)
Biological or physiological indicators have been unidentified → Diagnose with DSM-5, HAM-D
Suggested that some lifestyle habits are possible risk factors for depression

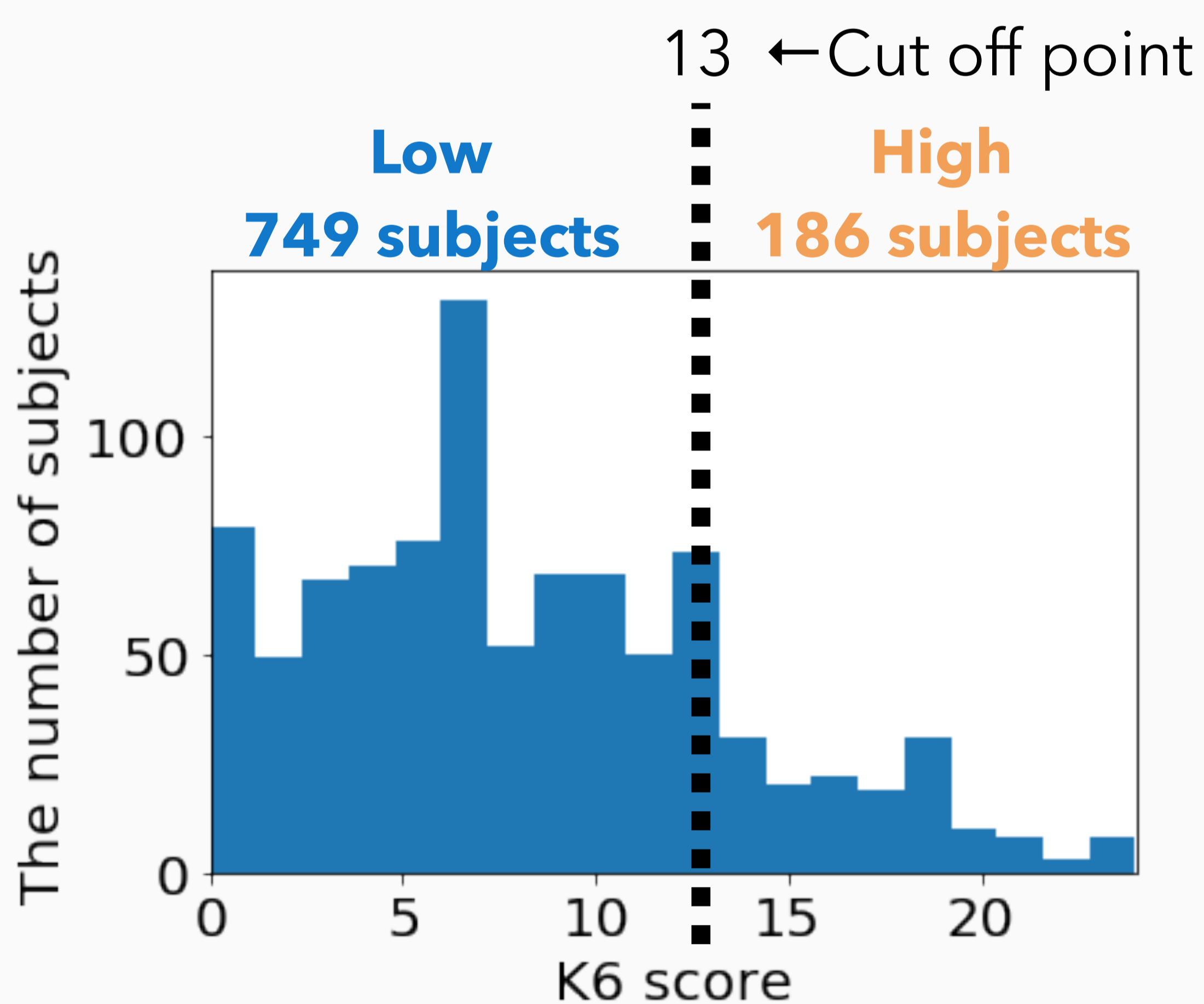
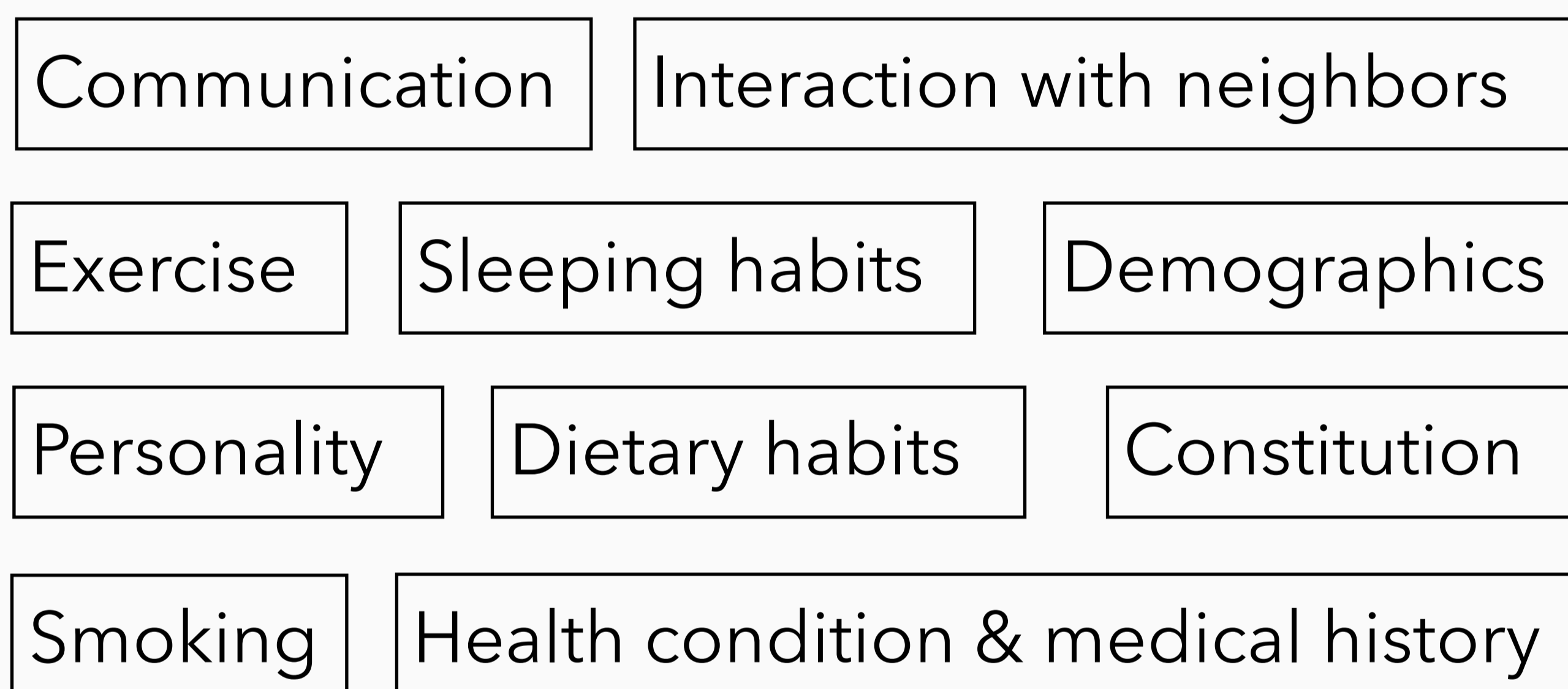
Purpose

1. To examine whether **lifestyle habits & constitution** can predict **depressive tendency**
2. To clarify important **lifestyle habits & constitution** for the prediction

	Predictive Performance	Categories
Previous studies	Unevaluated	Few
Our research	Evaluated	Many

Method

935 participants (M:35.3± 9.3) recruited from crowdsourcing answered 253 questions regarding their depressive tendency (K6) & personal data



1. Classify **Low** or **High** depressive tendency from personal data
 - Employ Random Forest and Logistic Regression base models
 - 186 participants each by under sampling
 - Train:Validation:Test 70:10:20 percent
2. Find important questions for the prediction at each model

Result

Accuracy of Classification:
Random Forest (RF) based : **0.97**
Logistic Regression (LR) based : 0.93
Misclassified Samples in Random Forest based
→2 participants
-False positives (K6 score 10)
-False negatives(K6 score 19)

Relatively Important questions for the prediction (RF)

Constitution:

- Are you likely to be scared or anxiety? **High > Low**
- Are you energetic? **Low > High**
- Are you likely to be tired? **High > Low**

Sleeping habits:

- During the past month, how much of a problem has it been for you to keep up enough enthusiasm to get things done? **High > Low**
- what time do you usually wake up? Late: **High > Low**

Dietary habits:

- How many times do you order take-away? **High > Low**
- How much do you drink miso soup per week? **Low > High**

Health Condition & Medical history:

- How is your health condition? Good: **Low > High**
- Have you ever been to a clinic for infertility? **High > Low**

Personality:

- I see myself as someone who gets nervous easily. **High > Low**
- who is relaxed, handles stress well. **Low > High**

Demographics:

- How old are you? Old: **Low > High**
- How tall are you? Tall: **High > Low**