

An Exploration of Joint Learning for Personality Prediction

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ATILA 2015

Antwerp, 16 October 2015

Personality types

Big Five (OCEAN)

- ▶ Openness to experience
 - ▶ Inventive/curious vs. consistent/cautious
- ▶ Conscientiousness
 - ▶ Efficient/organized vs. easy-going/careless
- ▶ Extraversion
 - ▶ Outgoing/energetic vs. solitary/reserved
- ▶ Agreeableness
 - ▶ Friendly/compassionate vs. analytical/detached
- ▶ Neuroticism (emotional stability)
 - ▶ Sensitive/nervous vs. secure/confident

Do the test at <http://www.outofservice.com/bigfive/>

CLiPS Stylometry Investigation Corpus

General details

- ▶ Verhoeven & Daelemans, 2014
- ▶ Freely available at www.clips.uantwerpen.be
- ▶ Fifth year of data collection starting

Corpus details

- ▶ Reviews and essays (short and long)
- ▶ Document metadata
- ▶ Author metadata

CSI Corpus

Document metadata

- ▶ Date
- ▶ Genre
- ▶ Review: truthfulness, category and topic
- ▶ Essay: grade

Author metadata

- ▶ Birth date
- ▶ Gender & Sexual Preference
- ▶ Region of origin
- ▶ Personality (Big Five & MBTI)

CSI Corpus

Statistics - version 2015-10

- > 1000 reviews
- > 500 essays

Average personality

- ▶ Openness 49.2
- ▶ Conscientiousness 46.9
- ▶ Extraversion 53.9
- ▶ Agreeableness 43.0
- ▶ Neuroticity 53.4

Simple Features

- ▶ Word n-grams [1,2]
- ▶ Character n-grams [3,4]
- ▶ LIWC features
- ▶ POS n-grams [1,2]

Personality interacts with deception?

Our hypotheses were:

- ▶ People with different personalities may lie/deceive in a different way, which will give us more clues for predicting their personality
- ▶ Some personality types may be better at deceiving others, which may cause the accuracy of deception detection to drop

Personality interacts with deception?

Exploration

- ✓ Personality recognition within deceptive and truthful reviews separately
- ✓ Add deception as a feature when learning personality
- × Joint learning of deception and personality
 - ▶ Probably only on OPN & EXT

Personality types

Structure

- ▶ Each trait has a value between 0 and 100
- ▶ Usual order: OCEAN = OPN, CON, EXT, AGR, NEU
- ▶ E.g. 24-50-89-76-04
- ▶ Making classes with binarization
- ▶ $N = [0:50]$; $Y = [50:]$

Personality interacts with deception?

	OPN	CON	EXT	AGR	NEU
Majority	50.1	53.5	59.8	56.1	55.1
Weighted Random	50.0	50.2	51.9	50.8	50.5
Best simple	62.0	53.5	54.3	54.9	53.0
Truthful	60.3	51.1	56.7	50.8	52.3
Deceptive	56.9	55.3	58.3	54.6	51.3
Deception feat	61.5	53.1	54.8	54.7	53.7

All data = \pm 800 reviews

Split data = \pm 400 reviews each

Personality interacts with deception

Tentative conclusions **Debunked?**

TRUE Neuroticism cannot be detected in Dutch reviews

FALSE Other personality traits are a lot harder (if not impossible) to detect in deceptive reviews, except for OPN

- ▶ Style obfuscation?

Joint learning of traits

Classes

All traits together, e.g. YNNNY, makes 32 classes

Evaluation on traits separately

Best results on reviews (train-dev)

	OPN	CON	EXT	AGR	NEU
Majority	50.1	53.5	59.8	56.1	55.1
Weighted Random	50.0	50.2	51.9	50.8	50.5
Best simple	62.0	53.5	54.3	54.9	53.0
Joint	57.4	55.2	56.4	53.9	56.8

- ▶ LIWC features are often important
- ▶ POS-tags also contribute
- ▶ Improved over best simple system for CON, EXT, NEU

Joint learning of traits

Other corpora

- ▶ PAN-2015 Dutch Twitter dataset (cancelled)
 - ▶ Very small, few authors (can't keep them apart)
 - ▶ Enormously skewed
- ▶ CSI Essays (version 2015-10)

Trends in Personality Prediction for Dutch

Big trends

- ▶ Openness is consistently the best recognizable trait
- ▶ Not a lot of structure in what else works

Small trends

- ▶ Personality is better detected when truthfulness is steady
- ▶ Adding deception as feature does not help
- ▶ LIWC features work well for joint learning of personality
- ▶ Joint learning helps the performance of previously lesser recognizable traits

Questions?

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