

Experiments on Automatic Extraction of Values from Texts

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Motivation

Compare:

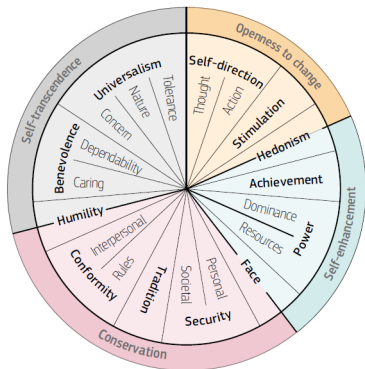
- Transformers VS Dictionaries [19 values]
- Expert Dictionary VS Learned Dictionary [10 values]

Characteristics:

- transformers: resource-intensive
- dictionary: lightweight
 - ▶ expert dictionary: hard to build, easy to interpret
 - ▶ learned dictionary: easy to build, hard to interpret

Performance?

Dataset: Labels



Schwartz values: fine (19), coarse (10), high-order (4)

Dataset: Data

SemEval 2023 Shared Task 4 "Human Value Detection"

5k text snippets annotated for fine grained Schwartz values

| | |
|---|---|
| It is important for news organizations to transfer to new forms of media, like the internet, but it is costly | ['Self-direction: thought'] |
| payday loans create a more impoverished society with their crazy payback rates. | ['Security: personal', 'Universalism: concern'] |
| Surrogacy should not be banned as it is the woman's right to choose if she wishes to do this for another | ['Self-direction: action'] |
| there are parades for every group and it is discrimination not to give gays their parade | ['Face', 'Humility', 'Universalism: concern', 'Universalism: tolerance'] |
| children have not grown and truly formed their adult looks. cosmetic surgery for a child should be banned | ['Benevolence: dependability', 'Universalism: objectivity'] |
| we should legalize prostitution because it will be regulated meaning the females will be safer | ['Security: personal', 'Security: societal', 'Universalism: objectivity'] |
| embryonic stem cell research should be subsidized because it may lead to the development of treatments | ['Security: personal'] |
| algorithms may not be 100% accurate and reflect the situation in the real market | ['Universalism: objectivity'] |
| We should legalize the organ trade because currently people are punished for obeying the law and not | ['Benevolence: caring', 'Universalism: concern', 'Universalism: objectivity'] |
| entrapment is gravely immoral and against human rights to coerce someone into a crime | ['Conformity: rules', 'Universalism: concern', 'Universalism: objectivity'] |
| if you start legalizing drugs it could open up the floodgates for more legalization of dangerous drugs. | ['Security: societal'] |
| nuclear weapons pose too serious a threat to our world. we must abolish them now. | ['Security: societal', 'Universalism: concern', 'Universalism: nature'] |
| telemarketing doesn't differentiate between people who are interested in being called and those who are not | ['Self-direction: action', 'Conformity: interpersonal'] |
| school prayer cannot account for the array of beliefs or non-beliefs students may hold. | ['Security: societal', 'Universalism: tolerance'] |
| we should not abolish the right to keep and bear arms as everyone has a right to keep guns as a means | ['Self-direction: action', 'Conformity: rules', 'Benevolence: caring'] |
| they are nothing but a cult and manipulate their members | ['Self-direction: thought'] |
| we need more organs than people donate so legalizing it would be a good thing | ['Universalism: objectivity'] |
| polygamy can lead to disharmony and jealousy within a household and the offspring of the arrangement | ['Benevolence: caring'] |
| intelligence tests should continue to be used because they provide valuable data | ['Universalism: objectivity'] |
| School prayer is divisive and requires children to either support religion without question or be treated as | ['Humility', 'Universalism: concern'] |
| Wikipedia can form biased opinions on topics or misinform the general public and therefore should not be | ['Self-direction: thought', 'Universalism: objectivity'] |
| where compulsory voting exists, in countries like Australia, participation rates are the highest in the world | ['Security: societal'] |
| legalizing prostitution will further demean a woman or man and result in unnecessary violence. | ['Conformity: rules'] |

<https://touche.webis.de/semEval23/touche23-web/>

Transformers VS Dictionaries

- transformers: XLM-Roberta-base
- dictionaries: Dict (1-gram), RAKE (MWE): TFIDF

| system | precision | recall | F1 | rank | comment |
|--------------|--------------|--------------|--------------|-----------|----------------------|
| Dict 100 | 0.320 | 0.514 | 0.395 | 78 | less than 1k words |
| Dict 400 | 0.373 | 0.432 | 0.400 | 79 | |
| Rake 100 | 0.317 | 0.434 | 0.366 | 85 | |
| Rake 400 | 0.373 | 0.391 | 0.382 | <i>81</i> | |
| Roberta 1500 | 0.514 | 0.312 | 0.388 | <i>80</i> | stopping criterion |
| Roberta 4500 | 0.470 | 0.447 | 0.458 | <i>48</i> | intended overfitting |

Table: Experimental results on the test set for the 3 different approaches and 2 different sets of parameters tested, F1 is micro, rank in italics indicates hypothetical ranks, as these submissions are not part of the official leaderboard.

Expert Dictionary VS Learned Dictionary

the 19 fine grained values are mapped to 10 coarse grained values

| | Ach. | Ben. | Conf. | Hed. | Pow. | Sec. | Self-Dir. | Stim. | Trad. |
|-------------------------|-------|-------|-------|-------|------|-------|-----------|-------|-------|
| # Words in learned dict | 36 | 32 | 83 | 24 | 74 | 118 | 48 | 15 | 23 |
| # Words in expert dict | 61 | 77 | 112 | 79 | 86 | 69 | 116 | 102 | 85 |
| # common words | 12 | 10 | 4 | 10 | 6 | 8 | 10 | 2 | 11 |
| % of learned covered | 25.0% | 23.8% | 4.6% | 29.4% | 7.5% | 6.3% | 17.2% | 11.8% | 32.4% |
| % of expert covered | 16.4% | 11.5% | 3.4% | 11.2% | 6.5% | 10.4% | 7.9% | 1.9% | 11.5% |

Table: Similarity in vocabulary for coarse grained values

| system | precision | recall | $F1_{mic.}$ | $F1_{mac.}$ |
|---------|-------------|-------------|-------------|-------------|
| Learned | 0.49 | 0.67 | 0.57 | 0.48 |
| Expert | 0.50 | 0.29 | 0.37 | 0.32 |
| Roberta | 0.68 | 0.65 | 0.66 | 0.55 |

Table: Comparison of the performance of an expert designed dictionary and a learned dictionary evaluated on the dev split

Conclusions

- FINE grained:
 - ▶ F1: transformers perform on par with dictionary
 - ▶ precision: transformer » dictionaries
 - ▶ recall: dictionaries » transformers
- COARSE grained:
 - ▶ F1: transformers » dictionaries
 - ▶ dictionaries: recall expert « recall learned
- potential topics-values bias in the dataset?

Article: <https://aclanthology.org/2023.semeval-1.290.pdf>

Ongoing work: Annotation Campaign for 9 languages:
<https://touche.webis.de/clef24/touche24-web>