BurnoutWords – Burnout Detection using Natural Language Processing for the Clinical Psychology

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« Machine intelligence raises deep scientific, engineering and societal challenges. We focus on identifying and defining solutions to these challenges. »
BurnoutWords
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Context
Burnout

Burnout is a syndrome conceptualized as resulting from chronic workplace stress that has not been successfully managed. It is characterised by three dimensions: 1) feelings of energy depletion or exhaustion; 2) increased mental distance from one’s job, or feelings of negativism or cynicism related to one's job; and 3) a sense of ineffectiveness and lack of accomplishment. [...] 

Source: International Classification of Diseases 11th Revision ICD-11 (WHO)
Current approach: Inventories

Example (extract) [1]:

<table>
<thead>
<tr>
<th>Strongly Agree</th>
<th>Agree</th>
<th>Disagree</th>
<th>Strongly Disagree</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
</tr>
</tbody>
</table>

After working, I have enough energy for my leisure activities

There are days when I feel tired before I arrive at work

It happens more and more often that I talk about my work in a negative way
Limitations of Inventories

- Users faking their results [2]
- Selecting extremes [3]
- Defensiveness/denial and social desirability bias [4]
Why not using free-text questions instead?

- Promising approaches in literature [5]
- Language often plays a central role in diagnosis in clinical psychology [6]
Why not using free-text questions instead?

- Promising approaches in literature [5]
- Language often plays a central role in diagnosis in clinical psychology [6]
- However, human labour cost in evaluation is a major obstacle
Project Goal:
Explore Natural Language Processing (NLP) methods to automatically detect burnout in texts.
Vision:
Enable the development of **new tools for the clinical psychology** of the future, based on free-text questions.
Other work in the field

- Majority: Depression detection based social media data
- Analyzing language use of depressed college students in essays [7]
- Studying the risk of burnout in comments/issues from a software development management tool [8]

→ Few work based on confirmed patient data or studying the burnout syndrome
Machine Learning in a Nutshell
Training Data → Model → cat

Image Source: pixabay.com
Project BurnoutWords
burnout

Training Data

Model

no burnout

Indication for burnout found!

...
Challenge: Gathering data

- Fully anonymized datasets
- Quantity of data
- Quality of data
Challenge: Gathering data
- Dataset 1: Transcribed interview extracts from existing research

Image Source: pixabay.com
Challenge: Gathering data
- Dataset 2: Anonymized posts from online forums
Challenge: Gathering data

- Dataset 3: Two anonymous online surveys (data collection ongoing)

Anonymous public survey

Anonymous patient survey with clinical partners

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Image Source: pixabay.com
First results and next steps

- Even though quantity of data is still limited, we have first promising results
- First classifier results are clearly above the baseline
- Next steps:
  - Increase the dataset
  - Improve our classifier
  - Interdisciplinary follow-up project
Vision

- Extend our approach
- Provide the basis for new methods in clinical psychology
- For different diagnoses and syndromes
- Provide handy tools for practitioners
Support our research by donating text!

- Completely anonymous
- Each word counts!

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Questions, Discussions?

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References