Emotions in the parliament:
Lexical emotion analysis of parliamentarian speech transcriptions

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15.06.2021

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Introduction

- Politics is very emotional
- Emotion are part of every human activity
- Can we extract emotions from transcripts of parliamentary speeches?
- Are emotions related to the opposition in parliament?
Theoretical background

Emotions

- **Circumplex model of emotions** (dimensional approach)
  - **Valence**: experience of one’s own positive or negative feelings
  - **Arousal**: the intensity, the activation level of one’s own feelings
  - **Dominance**: the control and dominance of one’s own feelings

![Circumplex Model Diagram](https://commons.wikimedia.org/wiki/File:Valence-Arousal_Circumplex.jpg)

- **Distinct emotions** (e.g. Ekman)
  - Sadness
  - Contempt
  - Happiness
  - Disgust
  - Surprise
  - Anger
  - Fear
Theoretical background

Emotions analyses in texts

Word lists

- **BAWL-R** (Võ et al., 2009): Berlin Affective Word List - Reloaded
- **SLE** (Leleu, 1987): Semantic Lexicon of Emotions
- **EMONORM** (Leveau et al., 2012)
- **NRC-VAD** (Mohammad, 2018): National Research Council Canada - Valence, Arousal, Dominance

![Table of Words and Emotions](image-url)
Theoretical background

Studies: Emotions in Parliament

Abercombe and Batista-Navarro (2020)
- Meta-analysis with 61 studies
  - 16 with lexicon based method / 14 predicting some form of party affiliation

Riabinin (2009)
- Canadian Parliament (Liberal vs. Conservative); English / French (translated in English)
  - 36th Parliament: Liberals (governing party) more positive emotions than Conservatives (opposition)

Hirst et al. (2014)
- Canadian Parliament (36th and 39th Parliament)
  - 39th Parliament: Conservatives (governing party) more positive emotions than Liberals (opposition)

Rheault et al. (2016)
- British Parliament (1909 – 2013)
  - The valence of politicians’ speeches got more positive and fluctuates with economic business cycles (recession, labour conflicts)

https://www.flickr.com/photos/european_parliament/27345992144
Theoretical background

Research questions

1. Do parliamentary speeches contain emotional information (valence, arousal)?

2. Are there differences in the emotional state of speeches between parliamentarian groups that lost more votings compared to groups that lost fewer votings?

- Opposition / groups with more lost votings show
  lower valence (more negative)
  higher arousal

  compared to governing party / groups with fewer lost votings
Methods

Samples and measurements

345 Speeches

329'031 words in 16'630 sentences

- French: 256'939 words in 10’168 sentences (78%)
- German: 72’092 words in 6’462 sentences (22%)

Words in speech included in word list:

- 31’978
  - French: 24’535
  - German: 7’443

Average of words in single speech

- 911 words of which 89 included in the word list (10%)
Methods

Samples and measurements

Parliamentary sessions
- 14 half days within 3 session weeks
- 130 parliamentarians and 130 substitutes

Votings
- 257 parliamentarians
- 196 votings
- 22,963 individual votes

Analyses
- Descriptive analyses
- Multilevel Analyses (Bayesian approach; brms)
Results

Descriptive statistics

Valence
- Mean 0.52; SD 1.08
- Range -0.90 to 1.40
Word list: -3 to +3

Arousal
- Mean 2.92; SD 0.69
- Range 2.25 to 3.37
Word list: 1 to 5

The ranges of the values in the speeches are bigger or similar to other studies.
Results

Distributions / Relationship

German: BAWL-R; French: SLE

German / French: BAWL-R

German / French: NRC-VAD
Results

Descriptive statistics

<table>
<thead>
<tr>
<th>Parl. group</th>
<th>Lost votes</th>
<th>Valence Mean</th>
<th>SD</th>
<th>Arousal Mean</th>
<th>SD</th>
</tr>
</thead>
<tbody>
<tr>
<td>Group 1</td>
<td>11%</td>
<td>0.49</td>
<td>1.06</td>
<td>3.06</td>
<td>0.73</td>
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<tr>
<td>Group 2</td>
<td>12%</td>
<td>0.52</td>
<td>1.04</td>
<td>3.02</td>
<td>0.70</td>
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<tr>
<td>Group 3</td>
<td>13%</td>
<td>0.62</td>
<td>1.11</td>
<td>2.71</td>
<td>0.60</td>
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<tr>
<td>Group 4</td>
<td>18%</td>
<td>0.48</td>
<td>1.10</td>
<td>3.03</td>
<td>0.71</td>
</tr>
<tr>
<td>Group 5</td>
<td>18%</td>
<td>0.64</td>
<td>1.07</td>
<td>2.62</td>
<td>0.54</td>
</tr>
<tr>
<td>VWin</td>
<td>14%</td>
<td>0.55</td>
<td>1.08</td>
<td>2.88</td>
<td>0.68</td>
</tr>
<tr>
<td>Group 6</td>
<td>32%</td>
<td>0.46</td>
<td>1.07</td>
<td>3.04</td>
<td>0.71</td>
</tr>
<tr>
<td>Group 7</td>
<td>33%</td>
<td>0.46</td>
<td>1.10</td>
<td>2.96</td>
<td>0.68</td>
</tr>
<tr>
<td>Group 8</td>
<td>35%</td>
<td>0.48</td>
<td>1.08</td>
<td>3.04</td>
<td>0.69</td>
</tr>
<tr>
<td>Group 9</td>
<td>35%</td>
<td>0.67</td>
<td>1.09</td>
<td>2.64</td>
<td>0.50</td>
</tr>
<tr>
<td>V Lose</td>
<td>34%</td>
<td>0.49</td>
<td>1.09</td>
<td>2.96</td>
<td>0.69</td>
</tr>
<tr>
<td>All</td>
<td>22%</td>
<td>0.52</td>
<td>1.08</td>
<td>2.92</td>
<td>0.69</td>
</tr>
</tbody>
</table>

Parl.group = Parliamentarian group; VWin = vote winners; Vlose = vote losers; SD = standard deviation
Results

Prediction of political affiliation

Bayesian Multilevel Analysis (brms)

German: BAWL-R; French: SLE (Leleu)

<table>
<thead>
<tr>
<th>Predictor</th>
<th>Estimate</th>
<th>Est.Error</th>
<th>l-CI</th>
<th>u-CI</th>
</tr>
</thead>
<tbody>
<tr>
<td>Intercept</td>
<td>-.48</td>
<td>.18</td>
<td>-.84</td>
<td>-.14</td>
</tr>
<tr>
<td>Valence</td>
<td>-.20</td>
<td>.12</td>
<td>.44</td>
<td>.05</td>
</tr>
<tr>
<td>Arousal</td>
<td>.22</td>
<td>.13</td>
<td>-.03</td>
<td>.47</td>
</tr>
<tr>
<td>Nov2019</td>
<td>-.10</td>
<td>.31</td>
<td>-.70</td>
<td>.51</td>
</tr>
<tr>
<td>Dez2019</td>
<td>-.07</td>
<td>.25</td>
<td>-.56</td>
<td>.43</td>
</tr>
</tbody>
</table>

Note. l-CI=lower limit credible interval; u-CI=upper limit credible interval

German / French: BAWL-R

<table>
<thead>
<tr>
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<th>Estimate</th>
<th>Est.Error</th>
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<th>u-CI</th>
</tr>
</thead>
<tbody>
<tr>
<td>Intercept</td>
<td>-.46</td>
<td>.18</td>
<td>-.81</td>
<td>-.12</td>
</tr>
<tr>
<td>Valence</td>
<td>-.34</td>
<td>.12</td>
<td>-.57</td>
<td>-.11</td>
</tr>
<tr>
<td>Arousal</td>
<td>.23</td>
<td>.12</td>
<td>-.01</td>
<td>.46</td>
</tr>
<tr>
<td>Nov2019</td>
<td>-.11</td>
<td>.31</td>
<td>-.73</td>
<td>.50</td>
</tr>
<tr>
<td>Dez2019</td>
<td>-.11</td>
<td>.26</td>
<td>-.63</td>
<td>.40</td>
</tr>
</tbody>
</table>

Note. FE=fixed effects; RE=random effects; ELPD=ExpectedLog Pointwise Predictive Density; LOO=Leave One Out; se=standard error
Discussion

Summary & Conclusions

1. Compared to other studies, the range of values of valence and arousal in the parliamentary speeches is at least about the same.
   - This means that there is **enough emotional information** in the transcribed speeches.

2. The prediction of affiliation to the opposition / parliamentary groups with more lost votes is not clear.
   - Depending on the analysis, **valence has a weak effect**.

- The **lexical approach** is useful.
- We were able to **replicate other studies** to some extent.
- To get better results, **other predictors** need to be taken into account: e.g. attributes of parliamentary sessions such as topics, affective potency of topics and non-emotional attributes.
Discussion

Some critical points

- In Swiss Parliaments exits no classical opposition.
- The measurement / estimation of arousal is tricky.
  - e.g. it depends on the word list.
- Translation of word lists: is not a valid method for creating word lists in other languages.
- The reasons for differences in the language of the speeches remain unclear.
- Other features in the speeches have an influence on emotions and on the parliamentarians affiliation.
  - Do we need special word list for parliaments?
- Relationship between valence and arousal (not the typical u-shape).

Source: https://pixabay.com/de/photos/blitz-gewitter-natur-wetter-sturm-4013539/
Thank you for your attention!

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