

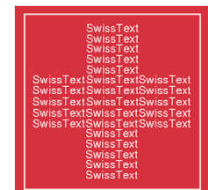
Emotions in the parliament:

Lexical emotion analysis of parliamentary speech transcriptions

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Introduction

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



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Foto: mengis media/andrea soltermann 2019



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Theoretical background

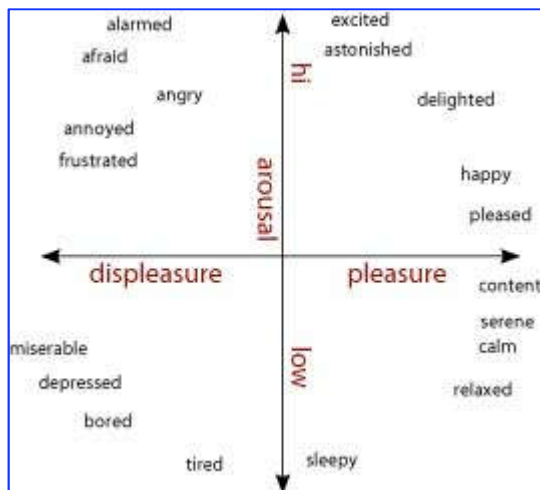
Emotions

■ 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



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

German

French

WORD	WORD_LOW	WORD_CLAS	EMO_MEAN	EMO_STD	USAL_MEAN	ROUSAL_STD	AGE_MEAN	IMAGE_STD	LETTERS	P
AAL	aal	N	-0.50000	0.70711	2.38095	1.24403	6.55556	0.72648	3	
AAS	aas	N	-2.10000	1.10050	2.63158	1.42246	5.44444	0.88192	3	
ABART	abart	N	-1.60000	0.69921	3.27778	1.01782	2.33333	1.32288	5	
ABBAU	abbau	N	-1.00000	1.16980	3.00000	1.29777	2.22727	1.23179	5	
ABBAUEN	abbauen	V	-0.80000	0.92000	2.10526	1.24252	3.67000	1.58000	7	
ABBILD	abbild	N	-0.20000	0.63246	2.10526	0.80930	3.77778	1.98606	6	
ABBRUCH	abbruch	N	-0.70000	1.15950	2.90476	1.04426	2.77778	1.09291	7	
ABDANKEN	abdanken	V	-0.40000	0.84000	2.66667	1.08465	2.67000	1.41000	8	
ABDRUCK	abdruck	N	-0.10000	0.31623	2.23529	0.97014	4.77778	1.30171	7	
ABEND	abend	N	1.65000	0.93330	1.83333	0.92355	4.45455	1.68261	5	
ABENDROT	abendrot	N	2.40000	0.69921	2.00000	1.02899	6.77778	0.44096	8	
ABENDS	abends	A	1.00000	1.15000	2.05263	1.39338	4.89000	1.27000	6	
ABFAHRT	abfahrt	N	0.30000	0.48305	3.11765	1.16632	4.88889	1.36423	7	
ABFALL	abfall	N	-1.70000	0.97872	2.41176	0.93934	5.22727	1.60154	6	
ABFLUG	abflug	N	0.70000	0.82327	3.14286	1.45896	5.22222	0.97183	6	
ABFUHR	abfuhr	N	-1.35000	1.08942	3.55000	1.14593	2.40909	1.62302	6	
ABGANG	abgang	N	-0.95000	1.05006	2.31579	1.05686	2.04545	1.25270	6	
ABGAS	abgas	N	-2.05000	0.88704	2.88235	1.05370	3.90909	1.54023	5	
ABGEBEN	abgeben	V	-0.02941	1.31392	2.19048	0.92839	3.34615	1.59856	7	
ABGRUND	abgrund	N	-1.40000	0.51640	3.88235	0.85749	6.22222	0.66667	7	
ABHANG	abhäng	N	-0.50000	0.52705	3.35294	1.22174	6.00000	0.70711	6	
ABHAUEN	abhauen	V	-0.90000	0.99000	3.21053	1.03166	4.44000	1.51000	7	
ABHILFE	abhilfe	N	0.80000	0.63246	2.15789	1.06787	1.77778	0.66667	7	



Theoretical background

Studies: Emotions in Parliament

Abercombie 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%)



Foto: mengis media/andrea soltermann 2019

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)



Foto: mengis media/andrea soltermann 2019



Results

Descriptive statistics

Valence

■ Mean 0.52; SD 1.08

■ Range -0.90 to 1.40

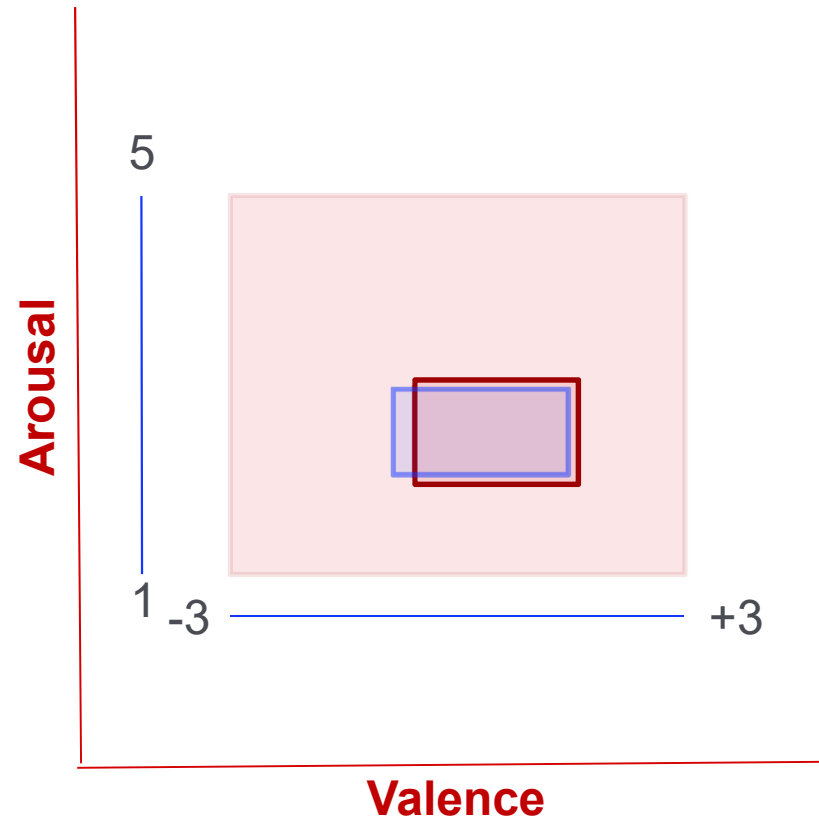
Word list: -3 to +3

Arousal

■ Mean 2.92; SD 0.69

■ Range 2.25 to 3.37

Word list: 1 to 5



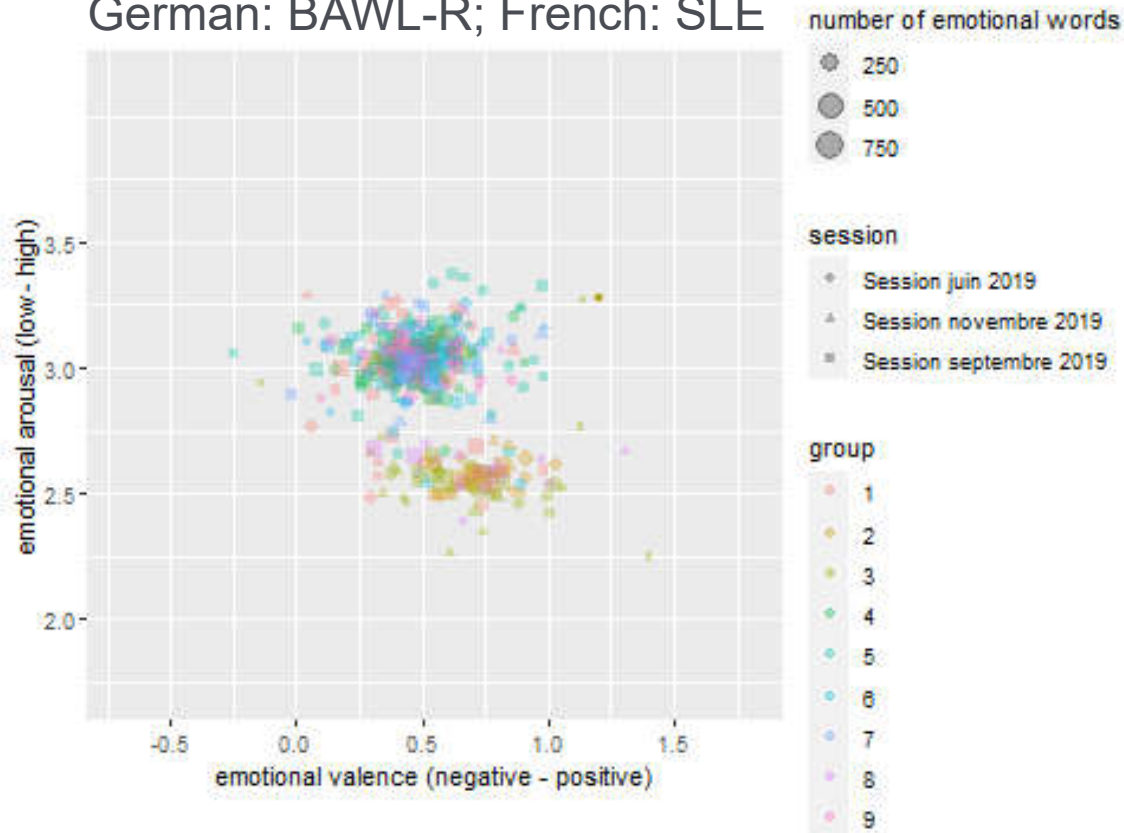
The ranges of the values in the speeches are bigger or similar to other studies.



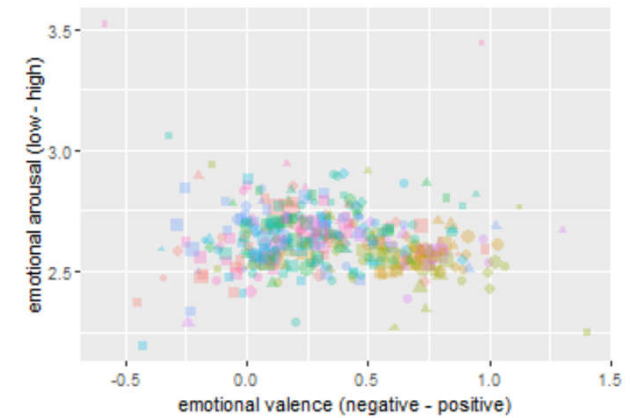
Results

Distributions / Relationship

German: BAWL-R; French: SLE



German / French: BAWL-R



German / French: NRC-VAD





Results

Descriptive statistics

Parl. group	Lost votes	Valence		Arousal		
		Mean	SD	Mean	SD	
<i>Group1</i>	11%	0.49	1.06	3.06	0.73	
<i>Group2</i>	12%	0.52	1.04	3.02	0.70	
<i>Group3</i>	13%	0.62	1.11	2.71	0.60	
<i>Group4</i>	18%	0.48	1.10	3.03	0.71	
<i>Group5</i>	18%	0.64	1.07	2.62	0.54	
<i>VWin</i>	14%	0.55	1.08	2.88	0.68	Vote winners
<i>Group6</i>	32%	0.46	1.07	3.04	0.71	
<i>Group7</i>	33%	0.46	1.10	2.96	0.68	
<i>Group8</i>	35%	0.48	1.08	3.04	0.69	
<i>Group9</i>	35%	0.67	1.09	2.64	0.50	
<i>VLose</i>	34%	0.49	1.09	2.96	0.69	Vote losers
<i>All</i>	22%	0.52	1.08	2.92	0.69	

Parl.group = Parliamentary 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)

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

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

German / French: BAWL-R

Predictor	Estimate	Est.Error	l-CI	u-CI
<i>Intercept</i>	-.46	.18	-.81	-.12
<i>Valence</i>	-.34	.12	-.57	-.11
<i>Arousal</i>	.23	.12	-.01	.46
<i>Nov2019</i>	-.11	.31	-.73	.50
<i>Dez2019</i>	-.11	.26	-.63	.40

Model	Diff ELPD	se	ELPD LOO
<i>Leleu – BAWL</i>			
<i>Model1RE</i>	0.00	0.00	-229.50
<i>Model0FE</i>	-0.01	3.12	-229.50
<i>Model1FE</i>	-0.05	1.17	-229.54
<i>Model2RE</i>	-1.04	1.20	-230.53
<i>Model2FE</i>	-1.16	0.26	-230.65

BAWL – BAWL

<i>Model1RE</i>	0.00	0.00	-227.25
<i>Model1FE</i>	-0.28	1.71	-227.53
<i>Model2FE</i>	-1.19	1.73	-228.44
<i>Model2RE</i>	-1.19	0.23	-228.44
<i>Model0FE</i>	-2.33	3.91	-229.57

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/>

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