Issue ownernship in party-centered online political communities : A content analysis of online political blogging

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Theoretical Framework
Party Competition

How do parties compete for votes?
Do parties struggle on the same political dimensions?

- Salience theory(Budge and Farlie, 1983; Petrocik, 1996; Riker, 1993):
  - Issue ownership (Ansolabehere et al., 1994; Petrocik, 1996)
  - orthogonal arguments (Austen-Smith, 1993)
  - dominance principle (Riker, 1993)
- Convergence theory (Sigelman and Buell, 2004; Kaplan et al., 2006)

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$\rightarrow$ We propose to study these issues on personnal political websites.

Theoretical Framework
Online Comunities

Online activity $\rightarrow$ notion of «Online Community» (see for ex. Rheingold (1993))
Two dimensions of Online Communities:

1. topographic dimension: i.e. hyperlink networks, comments networks, ...
2. semantic dimension : knowledge networks, epistemic networks, ...

Main hypothesis : these two dimensions matches (Adamic and Glance, 2005; Uchida et al., 2009; Cointet and Roth, 2009)

Data and Methods
Online Communities Detection

- Starting set of seeds : 159 Candidates of the 2009 Regional Elections
- + 94 actors discovered with an online community detection algorithm (Veny, 2014)
- 98 actors produced textual content + still active in January 2012

Party	seeds	Community	Final
PS	43	76	26
MR	56	75	27
Ecolo	27	79	34
CDH	33	35	11
	159	253	98

Data and Methods
Online Communities Detection

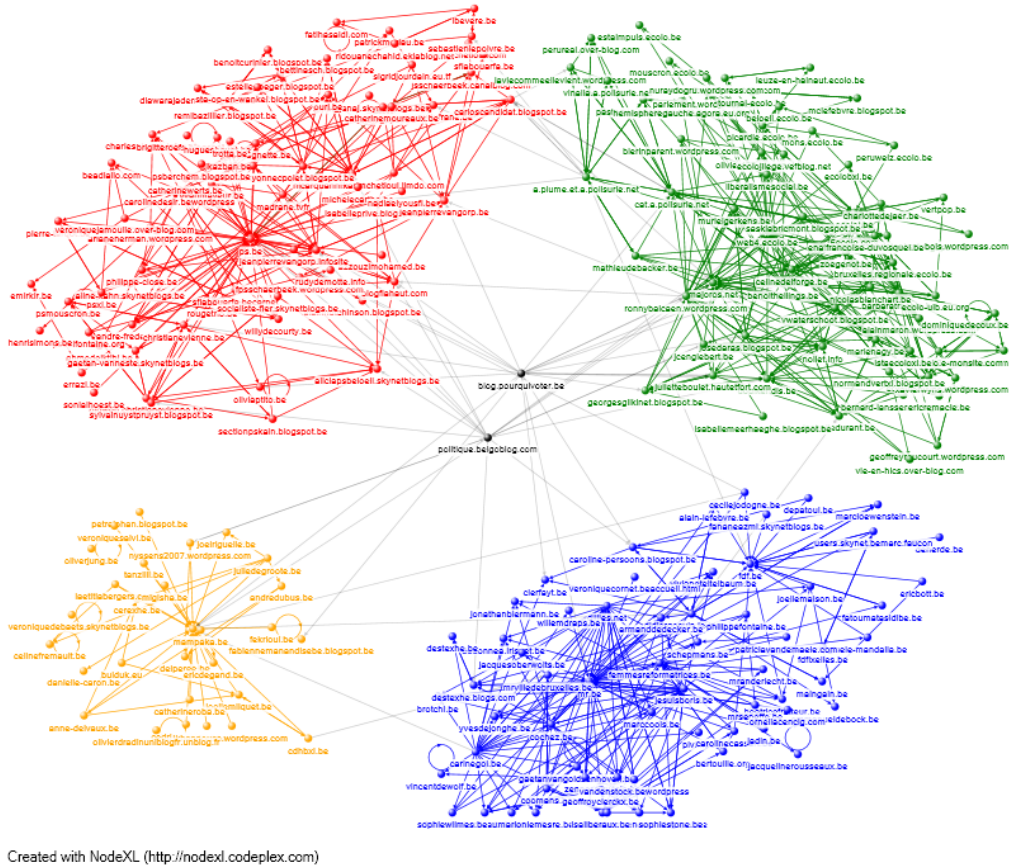


FIGURE: Hyperlink network of the 4 online communities

Data and Methods
Quantitative Content Analysis

What is a *topic?*

Most of the time pre-defined categories
then each text is coded in corresponding category
issues:

- difficult when many (many!) text
- difficult to define number of categories
- inter-coder reliability issues
- international / temporal comparison difficulties

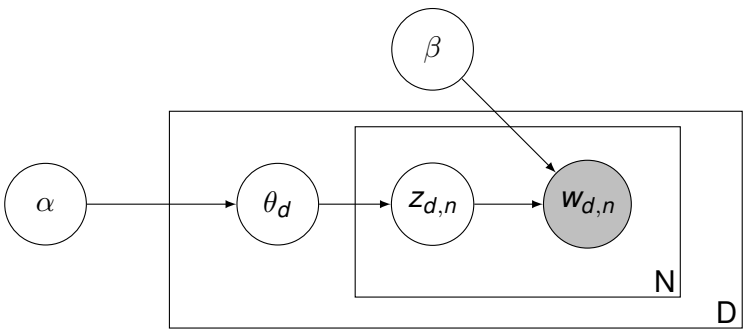
One possible solution:
$\rightarrow$ Quantitative content analysis (i.e. 'statistics with words')

Data and Methods
Quantitative Content Analysis

Latent Dirichlet Allocation (Blei et al., 2003)

Data and Methods
Quantitative Content Analysis

Latent Dirichlet Allocation (Blei et al., 2003)



where,
D is the number of documents
N is the number of words per document
$w_{d,n}$ is the n^{th} word in document d
$z_{d,n}$ is the topic at wich the word $w_{d,n}$ is assigned
θ_d is the probability distribution of the topics for the document d
α is the repartition of the topics on the corpus
β_k is the k^{th} topic

Probability of a document given the topic distribution :

$$p(\theta, \mathbf{z}, \mathbf{w} \mid \alpha, \beta) = p(\theta \mid \alpha) \prod_{n=1}^{N} p(z_n \mid z_n, \beta) p(z_n \mid \theta) \qquad (1)$$

Data and Methods
Quantitative Content Analysis

- A document is just a set of words
- Count the number of time each word is used in a document $\Rightarrow$ distribution of words .
- This distribution is driven by a Latent Variable $\Rightarrow$ «Topic»

$\Rightarrow$ Possible to define a number of k topics underlying the entire set of documents

Data and Methods
Quantitative Content Analysis

An example of a text and its underlying topic

> "In september 2012, nearly 2000 similar defects were discovered on the tank of the reactor of Tihange 2 nuclear central.[...] Defects (cracks) due to hydrogen have been detected in the transition ring during the conception of the tank of the Tihange 2 reactor. In was thus possible to detect similar defects in the tank as those detected in 2012. [...] Ecolo and Groen! are going to ask the government to take those into account before saying anything about the future of these two nuclear reactors. It is primordial to guarantee the absolute safety of the citizens – Muriel Gerkens - 2013 (translated from french

Data and Methods
Quantitative Content Analysis

An example of a text and its underlying topic

topic$_{141}$

"In september 2012, nearly 2000 similar defects were discovered on the tank of the reactor of Tihange 2 nuclear central.[...] Defects (cracks) due to hydrogen have been detected in the transition ring during the conception of the tank of the Tihange 2 reactor. In was thus possible to detect similar defects in the tank as those detected in 2012. [...] Ecolo and Groen! are going to ask the government to take those into account before saying anything about the future of these two nuclear reactors. It is primordial to guarantee the absolute safety of the citizens – Muriel Gerkens - 2013 (translated from french

Data and Methods
Quantitative Content Analysis

An example of a text and its underlying topic

$topic_{141}$
nuclear
reactor
safety
tank
defect
→ nuclear safety

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Data and Methods
Quantitative Content Analysis

An exemple of a text about multiple topics:

$topic_{19}$
européen
union
parlement
commission
europe
→ U.E

L'eurodéputée Anne Delvaux y a interpellé le commissaire Laszlo Andor en charge de l'emploi et de la politique sociale lui demandant ce qui avait été initié par la Commission depuis le dernier débat il y a 6 mois sur les vagues de licenciement en Europe et particulièrement chez Arcelor. [...] Il a également déclaré souscrire aux propos d'Anne Delvaux réclamant une véritable politique industrielle [...] Anne Delvaux a conclu en réinsistant une nouvelle fois sur l'urgence et sur la nécessité d'une réflexion sur l'avenir de la sidérurgie européenne.

$topic_{117}$
industriel
wallon
emploi
activité
licenciement
→ industrial
employement

Data and Methods
Data

Data:

- All textual posts of the 98 actors between Jan 2012 and July 2013.
- Final corpus : 4408 articles
- period divided into 6 trimesters

Units of Analysis = pairs of articles
==> Trying to predict whether two randomly selected articles are speaking about the same topic given three levels of analysis:

- individual level (micro)
- dyadic level (meso)
- community level (macro)

Results

TABLE: summary of the variables

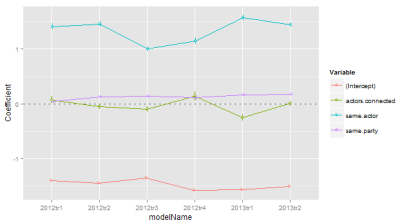
Dependent Variable		Independent Variables	
Var. Name	Modality	Var. Name	Modality
same.topic	yes	same.actor	yes
	no		no
		actor.connected	yes
			no
		same.party	yes
			no

→ Fitted with logistic regression.
3 topic models : 50, 150, 300 topics
6 trimesters modelled separately → 6 models for each topic model

Results
Simple effect model

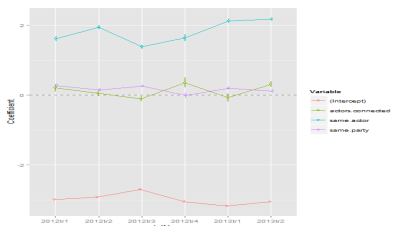
TABLE: Simple effects — 50,150 and 300 topics

50 Topics



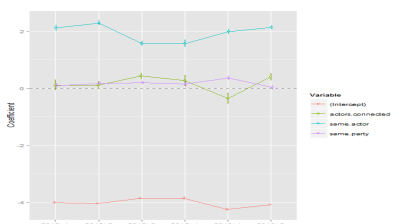
Var	β_{tr1}	β_{tr2}	β_{tr3}	β_{tr4}	β_{tr5}	β_{tr6}
(Intercept)	-1.40***	-1.44***	-1.36***	-1.58***	-1.56***	-1.51***
same.actor	1.41***	1.45***	1.00***	1.15***	1.57***	1.44***
actors.connected	0.07*	-0.05*	-0.10***	0.14***	-0.25***	0.00***
same.party	0.04***	0.13***	0.14***	0.11***	0.17***	0.18***

150 Topics



Var	β_{tr1}	β_{tr2}	β_{tr3}	β_{tr4}	β_{tr5}	β_{tr6}
(Intercept)	-2.99***	-2.92***	-2.70***	-3.05***	-3.17***	-3.05***
same.actor	1.61***	1.94***	1.38***	1.64***	2.12***	2.17***
actors.connected	0.21***	0.05	-0.10**	0.36***	-0.08	0.31***
same.party	0.27***	0.15***	0.26***	-0.01	0.20***	0.02***

300 Topics



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actors.connected	0.11	0.11	0.42***	0.27**	-0.36***	0.40***
same.party	0.09*	0.16**	0.19***	0.15**	0.35***	0.02***

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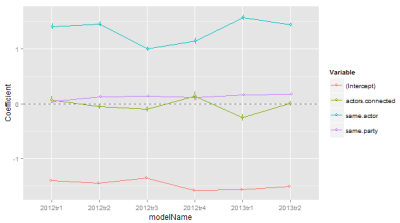

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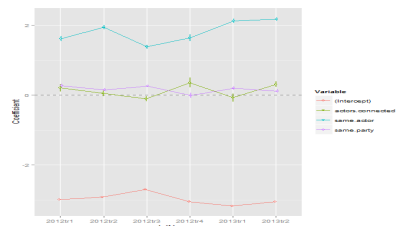

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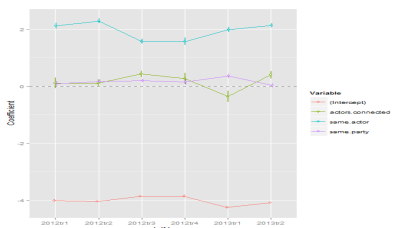

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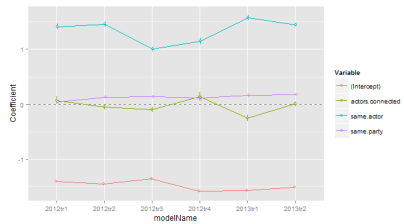

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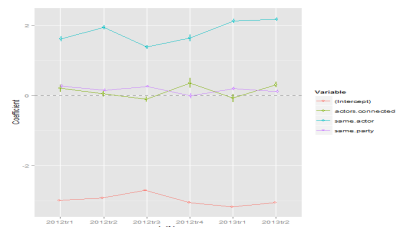

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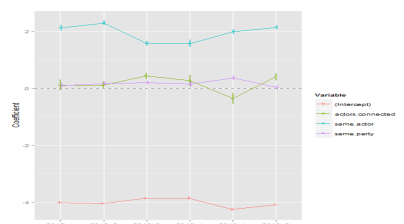

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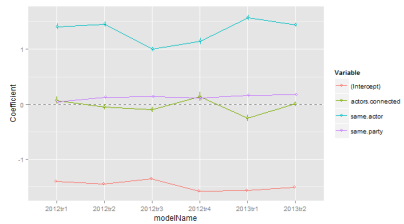

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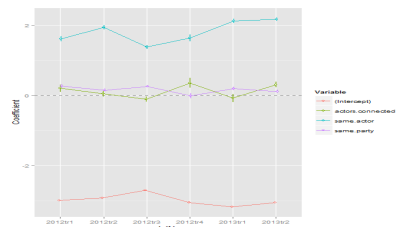

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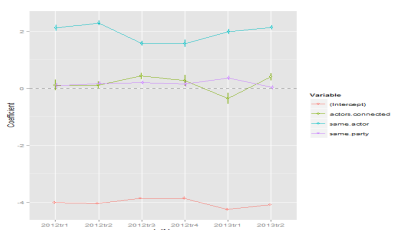

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Results
Interaction Effects Models

TABLE: summary of the variables

Dependent Variable		Independent Variables	
Var. Name	Modality	Var. Name	Modality
same.topic	yes	same.actor	yes
	no		no
		actor.connected	yes
			no
		party.interaction	cdh-cdh(ref)
			ps-ps
			mr-mr
			ecolo-ecolo
			ecolo-cdh
			ecolo-mr
			ecolo-ps
			mr-cdh
			ps-cdh
			ps-mr

→ Fitted with logistic regression with interaction effect
actor.connected * party.interaction.

Results
Interaction Effects Models

TABLE: Interactions effects model – 150 topics

	β_{tr1}	β_{tr2}	β_{tr3}	β_{tr4}	β_{tr5}	β_{tr6}
Main Effects:						
(Intercept)	-2.60***	-3.41***	-3.21***	-3.23***	-3.38***	-3.16***
same.actor	1.60***	2.00***	1.57***	1.70***	2.11***	2.11***
actors.connected	-0.76***	0.45**	0.87***	0.00	-0.35	-0.88***
Parties Effects:						
ps.ps	0.10***	0.80***	1.05***	0.14	0.56***	0.60
mr.mr	-0.00	0.39***	0.45***	0.00	0.37***	0.01
ecolo.ecolo	-0.33***	0.62***	0.48***	0.27·	0.15*	-0.24***
ecolo.cdh	-0.73	0.37***	0.24***	0.39**	0.32***	0.08
ecolo.mr	-0.50	0.27***	0.31***	0.14	-0.02	0.05
ecolo.ps	-0.27	0.67***	0.75***	0.28*	0.23***	0.06
mr.cdh	-0.41	0.35***	0.25***	0.20	0.03	0.09
ps.cdh	-0.29***	0.58***	0.34***	0.31*	0.46***	0.27***
ps.mr	-0.34**	0.44***	0.61***	-0.07	0.11·	0.15**
*Interaction Party*connect:*						
actors.connecolo.ecolo	1.33***	-0.48**	-0.60***	0.37	0.86***	1.81***
actors.connmr.mr	0.95***	0.74***	-0.49***	0.55·	0.90**	1.43***
actors.connps.ps	0.760**	-0.56***	-1.67***	0.37	-0.10	0.77***

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*Interaction Party*connect:*						
actors.connecolo.ecolo	1.33***	-0.48**	-0.60***	0.37	0.86***	1.81***
actors.connmr.mr	0.95***	0.74***	-0.49***	0.55·	0.90**	1.43***
actors.connps.ps	0.760**	-0.56***	-1.67***	0.37	-0.10	0.77***

Results
Interaction Effects Models

TABLE: Interactions effects model – 150 topics

	β_{tr1}	β_{tr2}	β_{tr3}	β_{tr4}	β_{tr5}	β_{tr6}
Main Effects:						
(Intercept)	-2.60***	-3.41***	-3.21***	-3.23***	-3.38***	-3.16***
same.actor	1.60***	2.00***	1.57***	1.70***	2.11***	2.11***
actors.connected	-0.76***	0.45**	0.87***	0.00	-0.35	-0.88***
Parties Effects:						
ps.ps	0.10***	0.80***	1.05***	0.14	0.56***	0.60
mr.mr	-0.00	0.39***	0.45***	0.00	0.37***	0.01
ecolo.ecolo	-0.33***	0.62***	0.48***	0.27·	0.15*	-0.24***
ecolo.cdh	-0.73	0.37***	0.24***	0.39**	0.32***	0.08
ecolo.mr	-0.50	0.27***	0.31***	0.14	-0.02	0.05
ecolo.ps	-0.27	0.67***	0.75***	0.28*	0.23***	0.06
mr.cdh	-0.41	0.35***	0.25***	0.20	0.03	0.09
ps.cdh	-0.29***	0.58***	0.34***	0.31*	0.46***	0.27***
ps.mr	-0.34**	0.44***	0.61***	-0.07	0.11·	0.15**
*Interaction Party*connect:*						
actors.connecolo.ecolo	1.33***	-0.48**	-0.60***	0.37	0.86***	1.81***
actors.connmr.mr	0.95***	0.74***	-0.49***	0.55·	0.90**	1.43***
actors.connps.ps	0.760**	-0.56***	-1.67***	0.37	-0.10	0.77***

Results
Interaction Effects Models

TABLE: Interactions effects model – 150 topics

	β_{tr1}	β_{tr2}	β_{tr3}	β_{tr4}	β_{tr5}	β_{tr6}
Main Effects:						
(Intercept)	-2.60***	-3.41***	-3.21***	-3.23***	-3.38***	-3.16***
same.actor	1.60***	2.00***	1.57***	1.70***	2.11***	2.11***
actors.connected	-0.76***	0.45**	0.87***	0.00	-0.35	-0.88***
Parties Effects:						
ps.ps	0.10***	0.80***	1.05***	0.14	0.56***	0.60
mr.mr	-0.00	0.39***	0.45***	0.00	0.37***	0.01
ecolo.ecolo	-0.33***	0.62***	0.48***	0.27·	0.15*	-0.24***
ecolo.cdh	-0.73	0.37***	0.24***	0.39**	0.32***	0.08
ecolo.mr	-0.50	0.27***	0.31***	0.14	-0.02	0.05
ecolo.ps	-0.27	0.67***	0.75***	0.28*	0.23***	0.06
mr.cdh	-0.41	0.35***	0.25***	0.20	0.03	0.09
ps.cdh	-0.29***	0.58***	0.34***	0.31*	0.46***	0.27***
ps.mr	-0.34**	0.44***	0.61***	-0.07	0.11·	0.15**
*Interaction Party*connect:*						
actors.connecolo.ecolo	1.33***	-0.48**	-0.60***	0.37	0.86***	1.81***
actors.connmr.mr	0.95***	0.74***	-0.49***	0.55·	0.90**	1.43***
actors.connps.ps	0.760**	-0.56***	-1.67***	0.37	-0.10	0.77***

Results
Interaction Effects Models

TABLE: Interactions effects model – 150 topics

	β_{tr1}	β_{tr2}	β_{tr3}	β_{tr4}	β_{tr5}	β_{tr6}
Main Effects:						
(Intercept)	-2.60***	-3.41***	-3.21***	-3.23***	-3.38***	-3.16***
same.actor	1.60***	2.00***	1.57***	1.70***	2.11***	2.11***
actors.connected	-0.76***	0.45**	0.87***	0.00	-0.35	-0.88***
Parties Effects:						
ps.ps	0.10***	0.80***	1.05***	0.14	0.56***	0.60
mr.mr	-0.00	0.39***	0.45***	0.00	0.37***	0.01
ecolo.ecolo	-0.33***	0.62***	0.48***	0.27·	0.15*	-0.24***
ecolo.cdh	-0.73	0.37***	0.24***	0.39**	0.32***	0.08
ecolo.mr	-0.50	0.27***	0.31***	0.14	-0.02	0.05
ecolo.ps	-0.27	0.67***	0.75***	0.28*	0.23***	0.06
mr.cdh	-0.41	0.35***	0.25***	0.20	0.03	0.09
ps.cdh	-0.29***	0.58***	0.34***	0.31*	0.46***	0.27***
ps.mr	-0.34**	0.44***	0.61***	-0.07	0.11·	0.15**
*Interaction Party*connect:*						
actors.connecolo.ecolo	1.33***	-0.48**	-0.60***	0.37	0.86***	1.81***
actors.connmr.mr	0.95***	0.74***	-0.49***	0.55·	0.90**	1.43***
actors.connps.ps	0.760**	-0.56***	-1.67***	0.37	-0.10	0.77***

Results
Interaction Effects Models

TABLE: Interactions effects model – 50 topics

	β_{tr1}	β_{tr2}	β_{tr3}	β_{tr4}	β_{tr5}	β_{tr6}
Main Effects:						
(Intercept)	-1.46***	-1.48***	-1.82***	-1.71***	-1.32***	-1.46***
same.actor	1.42***	1.46***	1.13***	1.21***	1.52***	1.40***
actors.connected	-0.33**	-0.13	0.35***	-0.21	-0.80***	-0.34***
Parties Effects:						
ecolo.cdh	0.03	-0.04	0.25***	0.17	-0.22***	0.04
ecolo.ecolo	-0.06	0.14***	0.41***	0.31**	-0.27***	-0.13***
ecolo.mr	-0.10·	-0.09·	0.39***	0.06	-0.38***	-0.01
ecolo.ps	0.11·	0.03	0.53***	0.14	-0.33***	-0.16***
mr.cdh	0.07	0.10·	0.33***	0.17	-0.21***	0.00
mr.mr	0.05	-0.07	0.53***	0.05	-0.31***	-0.06·
ps.cdh	0.24***	0.30***	0.35***	0.06	-0.02	0.07*
ps.mr	0.09	0.04	0.59***	0.16	-0.24***	-0.11***
ps.ps	0.41***	0.33***	0.74***	0.24*	0.08*	0.42***
*Interaction party*connect:*						
actors.conn:ecolo.ecolo	0.66***	0.07	-0.27**	0.43*	1.01***	0.49***
actors.conn:mr.mr	0.48**	0.24·	-0.17*	0.59**	1.21***	0.80***
actors.conn:ps.ps	0.13	0.01	-0.66***	0.27	0.26*	-0.08

Results
Interaction Effects Models

TABLE: Interactions effects model – 300 topics

	β_{tr1}	β_{tr2}	β_{tr3}	β_{tr4}	β_{tr5}	β_{tr6}
Main Effects:						
(Intercept)	-3.52***	-4.38***	-3.82***	-3.74***	-4.31***	-4.04***
same.actor	2.14****	2.35***	1.60***	1.74***	1.98***	2.07***
actors.connected	-1.22**	0.49*	0.82***	-0.77	-0.71·	-0.64·
Parties Effect:						
ecolo.cdh	-0.64***	0.22*	-0.46***	0.02	0.14	-0.06
ecolo.ecolo	-1.12***	0.41***	0.13	0.27	0.03	-0.56***
ecolo.mr	-0.49***	0.02	-0.14	-0.29	-0.10	-0.17*
ecolo.ps	-0.73***	0.51***	0.11	0.13	0.08	-0.23**
mr.cdh	-0.23*	0.31**	-0.28**	-0.04	0.12	0.00
mr.mr	0.30**	0.62***	0.17*	-0.60***	0.48***	0.02
ps.cdh	-0.21·	0.38***	-0.20*	-0.13	0.12	0.20*
ps.mr	-0.40***	0.33***	0.07	-0.45*	-0.04	0.02
ps.ps	-0.22*	0.55***	0.13	-0.04	0.54***	0.18*
*Interaction party*connect:*						
actors.conn:ecolo.ecolo	1.65***	-0.28	-0.48**	0.82	1.47***	1.28***
actors.conn:mr.mr	-0.13	-0.35	-0.26	1.88***	0.20	1.30***
actors.conn:ps.ps	1.67***	-0.43·	-0.61***	0.84	-0.52	0.96***

Results
Interaction Effects Models

TABLE: summary

Party	dyadic level	community level	
CDH	low	low	weak online activity
PS	medium	high	strong insitutionalized community
MR	high	low	low institutionalized community with strong interpersonality
ECOLO	high	low	low institutionalized community with strong interpersonality

$\rightarrow$ Differences can be explained by the (offline) history of these political communities

Conclusion

Main Conclusions:

- High individualisation (Druckman et al. (2010))
- Topic convergence during elections
- mixed effect of connectedness
  - periodically different
  - depending on the number of topics modeled
  - different in the 4 communities
- 'Party effect' different from one community to another

$\rightarrow$ online communities grounded in historically situated political groups

Further research:

- In-depth evaluation of the topics
- Different kind of elections
- Comparative research with other countries

Conclusion

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Thank you for your attention!