

# Trump and Other Dominating Egocentric Subgraphs from Wikipedia Pages Associated with Christian Nationalism

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# Christian Nationalism I

- ▶ **Christian nationalism (CN)** draws on different parts of the Bible, integrating Old Testament demands for ethnocultural purity and military conquest with Christian triumphalism (Gorski, 2017b).
- ▶ Combining these and other symbols, myths, traditions, and narratives, Christian nationalism is a cultural framework that insists upon a fusion of American civic life and a particular vision of Christianity—one that contains hierarchical assumptions about race, gender, nationality, and sexuality.
- ▶ It demands that the United States be “Christian” in its national identity, historical narratives, sacred symbols, and public policies (Whitehead and Perry, 2020).

# Christian Nationalism II

- ▶ CN is considered to be a religio-political ideology that motivates a subset of American Christians to both lay claim to and contend for epistemic and moral authority in the public sphere. The predictive power of CN exceeds measures of biblicist Christianity, religiosity, and political conservatism (see Baker, Perry, and Whitehead, 2020).
- ▶ A politically active demographic with high levels of skepticism and distrust in scientific authority undermines a political community's ability to advance science-based policy. Interference with science-based public policy has been most prominent with climate change (see Pilkey and Pilkey, 2011; Tom, 2018), education (evolution), and most recently with respect to public health measures during the Covid-19 pandemic.

# Purpose of Study

- ▶ It is important for policy reasons to identify the structural–relational dynamics shaping the components and forces that make up CN.
- ▶ Thus, one might seek to discover sub–networks that may be receptive to public health messaging and which co–develop in a process of *concrecence* (Alfred Whitehead) together with other sub–networks connected to CN.
- ▶ Challenges to network analysis of such phenomena:
  - ▶ Standard social media analysis only reveals skewed public connections or connections that organizations intentionally disclose/display.
  - ▶ Investigative journalism does not have the resources to reveal large networks of big data.
- ▶ As a remedy, we resort to connections between Wikipedia pages which can reveal relationships between organizations and individuals that other methods might miss.

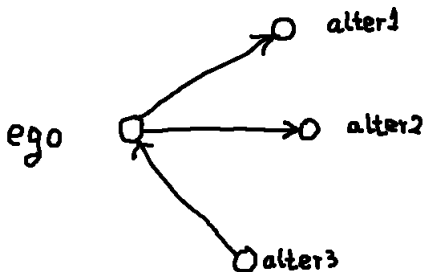
# The Wikipedia PageLink Graph on CN

The Wikipedia PageLink Graph on Christian Nationalism (CN) is a **directed graph**:

- ▶ 4,699 nodes (pages) and 314,693 edges (hyperlinks);
- ▶ out-degree range = 0 – 597; in-degree range = 0 – 1,205;
- ▶ number of isolates = 9;
- ▶ weakly disconnected with 22 weakly connected components, the largest of which has 4,665 nodes and 314,672 edges;
- ▶ strongly disconnected with 887 strongly connected components, the largest of which has 3,726 nodes and 302,175 edges;
- ▶ density = 0.014;
- ▶ transitivity coefficient = 0.829;
- ▶ average clustering coefficient = 0.449;
- ▶ reciprocity coefficient = 0.773.

# Twitter Terminology on Wikipedia PageLink Graphs

USING TWITTER TERMINOLOGY ON A WIKIPEDIA NETWORK (Directed Graph of PageLinks)



**Ego  $\rightarrow$  Alter1/2:**

1. Ego is hyperlinkING TO Alter1/2
2. Alter1/2 is OUT-neighbor of Ego
3. Alter1/2 is a FRIEND of Ego

**Ego  $\leftarrow$  Alter3:**

1. Ego is hyperlinked BY Alter3
2. Alter3 is IN-neighbor of Ego
3. Alter3 is a FOLLOWER of Ego

# Directed Graph Egocentricity

## Definition

Let  $G$  be a Wikipedia PageLink directed graph and let the page  $A$  be a node in  $G$ . Then:

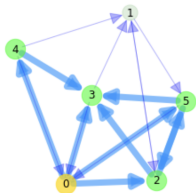
- ▶ The **egocentric subgraph** (or **ego-net**) of  $A$  is the subgraph of  $G$  formed by  $A$  (the **ego**) and all its friends or followers (**alters**).
- ▶ The **outward-egocentric subgraph** (or **out-ego-net**) of  $A$  is the subgraph of  $G$  formed by  $A$  (the **ego**) and all its friends (**alters**) (i.e., followers who are not friends of  $A$  are not in the out-ego-net of  $A$ ).
- ▶ The **inward-egocentric subgraph** (or **in-ego-net**) of  $A$  is the subgraph of  $G$  formed by  $A$  (the **ego**) and all its followers (**alters**) (i.e., friends who are not followers of  $A$  are not in the in-ego-net of  $A$ ).

## Ego is Outward-Ego

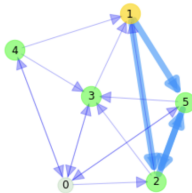
*Here, in the case of Wikipedia PageLink graphs, we are only considering outward-ego-nets, although we are omitting the outward- prefix referring to them simply as ego-nets.*

## 6 outward-ego-nets of the Erdos-Renyi random directed graph

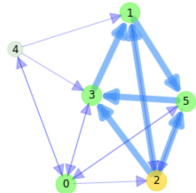
[1] outward-ego-net centered at 0



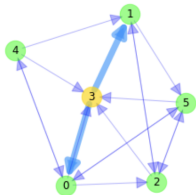
[2] outward-ego-net centered at 1



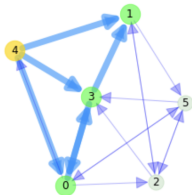
[3] outward-ego-net centered at 2



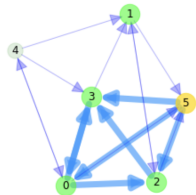
[4] outward-ego-net centered at 3



[5] outward-ego-net centered at 4



[6] outward-ego-net centered at 5





# A Notion of Graph Domination Based on Egocentricity

## Definition

1. A page  $A$  is said to be an **egocentric dominating node (e-dominating node)** if there exists at least one page  $B$ , which is friend of  $A$ , such that the out-ego-net of  $B$  is contained in the out-ego-net of  $A$ .
2. In case (1) holds, page  $B$  is said to be an **egocentric dominated node (e-dominated node)** by the e-dominating node page  $A$ .
3. A page  $C$  is said to be an **egocentric independent node (e-independent node)** if  $C$  is neither e-dominating nor e-dominated node.

## A Word of Warning!

“E-ominating–E-dominating–E-independent **nodes**” should not be confused with the homonym terms of “dominating–dominated–independend **set**” of Graph Theory (though they can be formally related).

## Proposition

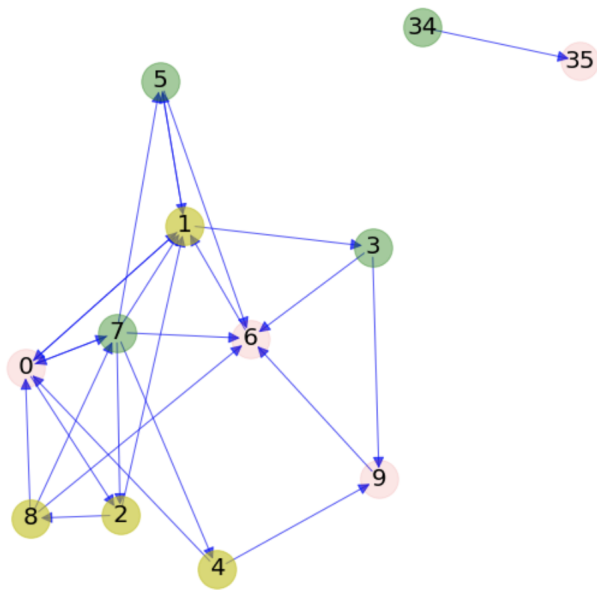
- ▶ A page  $A$  is an **e-dominating node** if and only if there exists at least one page  $B$ , which is friend of  $A$ , such that all friends of  $B$  are friends  $A$  too.
- ▶ A page  $B$  is an **e-dominated node** if and only if there exists at least one page  $A$ , which is follower of  $B$ , such that all friends of  $B$  are friends  $A$  too.
- ▶ A page  $C$  is an **e-independent node** if and only if, for every page  $B$ , which is friend or follower of  $C$ , there exists at least one friend of  $B$  which is not a friend  $C$ .

## Definition

Let  $A$  be a Wikipedia page and  $EN(A)$  be the ego-net of  $A$ . Then  $EN(A)$  is called **dominating ego-net** (denoted as **DEN**) if  $A$  is an e-dominating node.

# Example of an Erdos–Renyi Random Digraph:

4 dominating, 4 dominated and 4 independent nodes



# Structural Interpretation of the Ratio of E-Dominating Nodes

## Interpretation

Let  $A$  be a Wikipedia page:

- ▶  $EN(A)$  the ego-net of  $A$ ,
- ▶  $dom(A) \in [0, 1]$  the ratio of e-dominating nodes inside  $EN(A)$  and
- ▶  $ind(A) \in [0, 1]$  the ratio of e-independent nodes inside  $EN(A)$ .

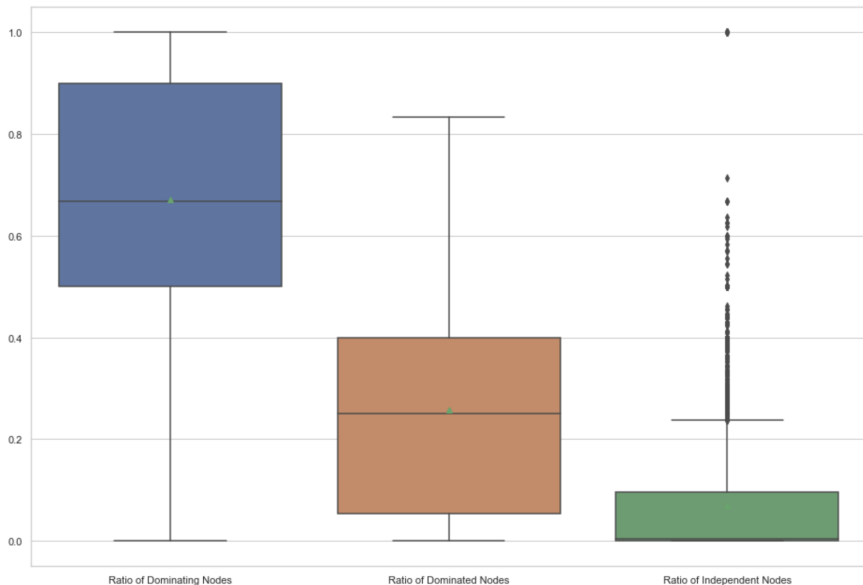
Then:

- ▶ “ $dom(A)$  large” and “ $ind(A)$  small” mean that ego  $A$  is retaining the flow of information from its alters towards pages outside the ego-net of  $A$ .
- ▶ “ $dom(A)$  small” and “ $ind(A)$  large” mean that the flow of information escapes substantially from  $A$ 's alters towards pages outside the ego-net of  $A$ .

# Ego-Domination in the Wikipedia PageLink Graph on CN

	Node	Number of Neighbors	Ratio of Dominating Nodes	Ratio of Dominated Nodes	Ratio of Independent Nodes
311	Donald Trump	1208	0.509	0.093	0.399
403	Jim Jordan (American politician)	617	0.811	0.146	0.044
852	Fox News	554	0.445	0.126	0.429
1120	Ted Cruz	551	0.547	0.207	0.246
629	Breitbart News	517	0.666	0.243	0.091
493	Federalist Society	516	0.619	0.207	0.174
202	Radical right (United States)	507	0.667	0.258	0.075
676	Alex Jones	491	0.618	0.268	0.114
173	Nancy Pelosi	491	0.803	0.049	0.148
555	Republican Study Committee	487	0.709	0.172	0.119
630	Tea Party movement	487	0.451	0.250	0.299
729	Council of Conservative Citizens	479	0.688	0.271	0.042
498	Steve Bannon	471	0.712	0.195	0.093
16	Rand Paul	471	0.581	0.216	0.203
308	Barry Goldwater	471	0.608	0.203	0.189
59	The Wall Street Journal	470	0.505	0.134	0.361
26	Mitt Romney	469	0.621	0.094	0.285
327	Ron Paul	469	0.636	0.100	0.264
426	Constitution Party (United States)	464	0.600	0.217	0.183
92	National Rifle Association	463	0.569	0.222	0.209
143	National Review	460	0.416	0.213	0.371
484	2021 storming of the United States Capitol	452	0.837	0.053	0.110
435	Regnery Publishing	452	0.693	0.225	0.082
50	Louie Gohmert	432	0.940	0.032	0.028
1075	The Washington Times	431	0.468	0.245	0.287
462	Matt Gaetz	427	0.937	0.023	0.040
361	Mike Cernovich	426	0.686	0.279	0.035
489	Marjorie Taylor Greene	423	0.950	0.033	0.017
43	Eric Swalwell	420	0.960	0.021	0.019
832	Steve Sailer	420	0.694	0.299	0.007

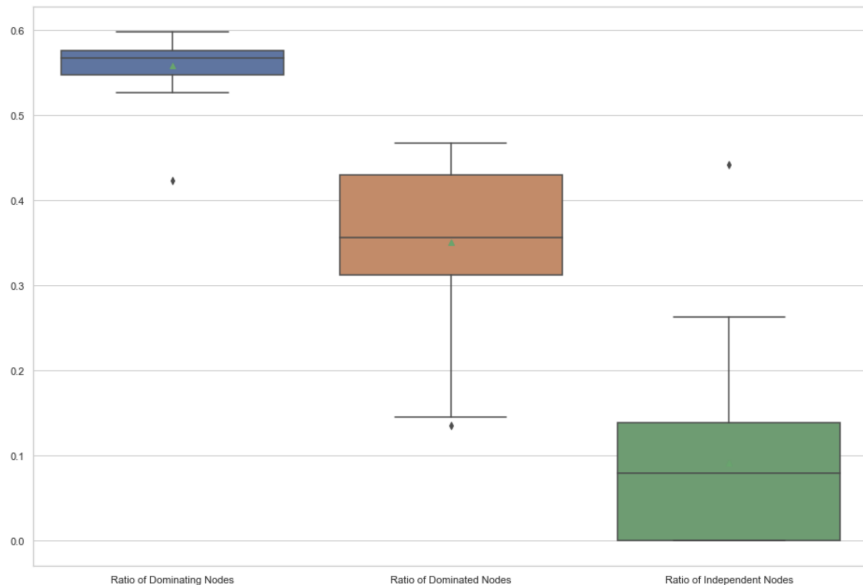
# Boxplots of Ego-Domination



# Domination of the Top 30 Ego-Nets with $\text{dom} \in (0.5, 0.6)$

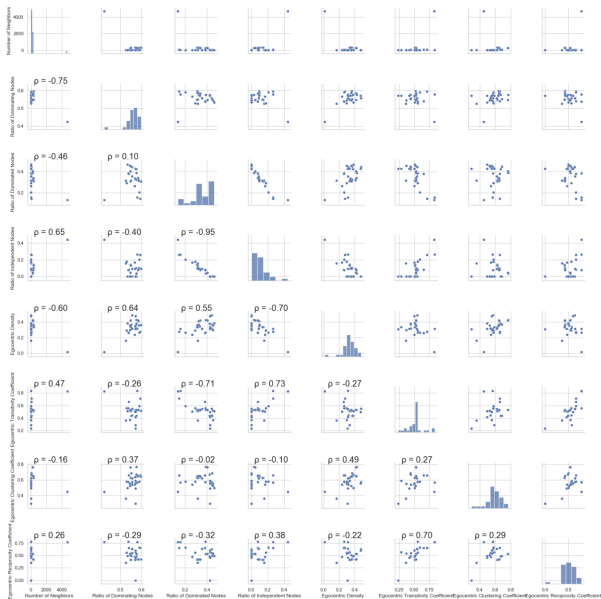
	Node	Number of Neighbors	Ratio of Dominating Nodes	Ratio of Dominated Nodes	Ratio of Independent Nodes	Egocentric Density	Egocentric Transitivity Coefficient	Egocentric Clustering Coefficient	Egocentric Reciprocity Coefficient
0	The whole graph	4699	0.423	0.135	0.442	0.014	0.829	0.449	0.773
1	Advocates for Self-Government	18	0.579	0.158	0.263	0.316	0.838	0.565	0.778
2	Alliance Defending Freedom	324	0.597	0.311	0.092	0.364	0.521	0.642	0.423
3	American Family Association	322	0.573	0.325	0.102	0.369	0.521	0.639	0.421
4	American Friends of the British National Party	8	0.556	0.444	0.000	0.486	0.553	0.570	0.629
5	Americans for Limited Government	18	0.526	0.316	0.158	0.164	0.365	0.360	0.357
6	Americans for a Republican Majority	6	0.571	0.429	0.000	0.333	0.289	0.586	0.571
7	Black conservatism	62	0.540	0.381	0.079	0.261	0.657	0.656	0.658
8	Black conservatism in the United States	334	0.570	0.337	0.093	0.344	0.528	0.637	0.420
9	Charles Murray (political scientist)	29	0.567	0.267	0.167	0.238	0.504	0.541	0.473
10	Dave Hunt (Christian apologist)	12	0.538	0.385	0.077	0.263	0.569	0.572	0.780
11	Family Research Council	340	0.548	0.308	0.144	0.334	0.520	0.627	0.418
12	Foreign policy of the Donald Trump administration	50	0.529	0.294	0.176	0.295	0.567	0.577	0.564
13	Government Accountability Institute	6	0.571	0.429	0.000	0.476	0.300	0.555	0.600
14	Institute for Historical Review	68	0.594	0.145	0.261	0.274	0.714	0.665	0.656
15	John Fleming (American politician)	38	0.590	0.305	0.205	0.267	0.596	0.575	0.662
16	Michael Tracey (American journalist)	17	0.556	0.444	0.000	0.317	0.447	0.537	0.557
17	Mike Adams (conspiracy theorist)	6	0.571	0.429	0.000	0.310	0.237	0.295	0.000
18	National Reform Association (United States)	66	0.552	0.448	0.000	0.370	0.438	0.687	0.487
19	National Standards for United States History	65	0.576	0.424	0.000	0.378	0.438	0.669	0.483
20	Paul Pressler (politician)	13	0.571	0.429	0.000	0.313	0.417	0.493	0.456
21	Republicans for the Rule of Law	10	0.546	0.455	0.000	0.300	0.388	0.552	0.545
22	Social conservatism in the United States	346	0.550	0.317	0.133	0.327	0.511	0.624	0.414
23	Tax protester conspiracy arguments	10	0.545	0.455	0.000	0.355	0.521	0.524	0.513
24	The Fellowship (Christian organization)	326	0.587	0.312	0.101	0.356	0.529	0.646	0.427
25	TheCall (organization)	14	0.533	0.467	0.000	0.386	0.511	0.494	0.494
26	Tony Perkins (politician)	256	0.576	0.389	0.035	0.428	0.531	0.765	0.538
27	United States Chamber of Commerce	300	0.585	0.322	0.093	0.412	0.533	0.653	0.426
28	Veracity of statements by Donald Trump	44	0.556	0.356	0.089	0.315	0.544	0.621	0.638
29	Women in conservatism in the United States	299	0.583	0.340	0.077	0.424	0.533	0.645	0.421
30	Young Americans for Freedom	258	0.548	0.405	0.046	0.420	0.531	0.759	0.535

## Boxplots of the Top 30 Dominating Ego-Nets with $\text{dom} \in (0.5, 0.6)$



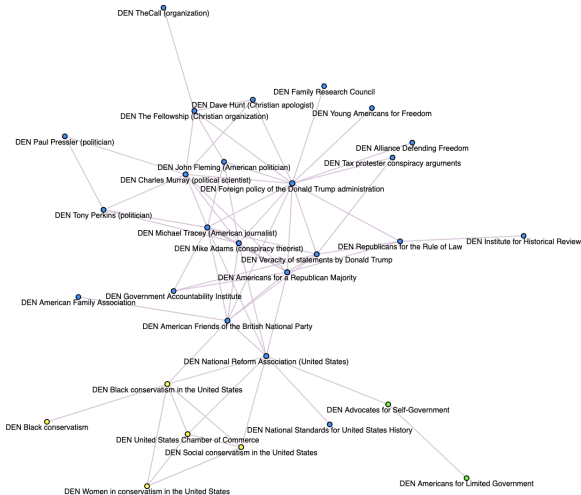


### Pairplots of the Top 30 Dominating Ego-Nets with $\text{dom} \in (0.5, 0.6)$



# The Intersection Graph of the Top 30 Dominating Ego-Nets with $\text{dom} \in (0.5, 0.6)$

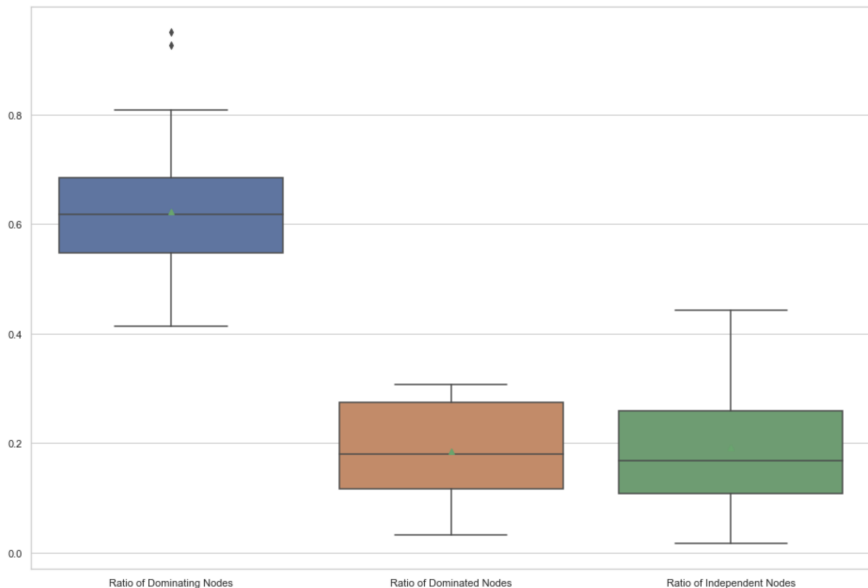
The intersection graph the top 30 DENs with  $\text{dom}$  in  $(0.5, 0.6)$  (colored in 3 Girvan-Newman communities)



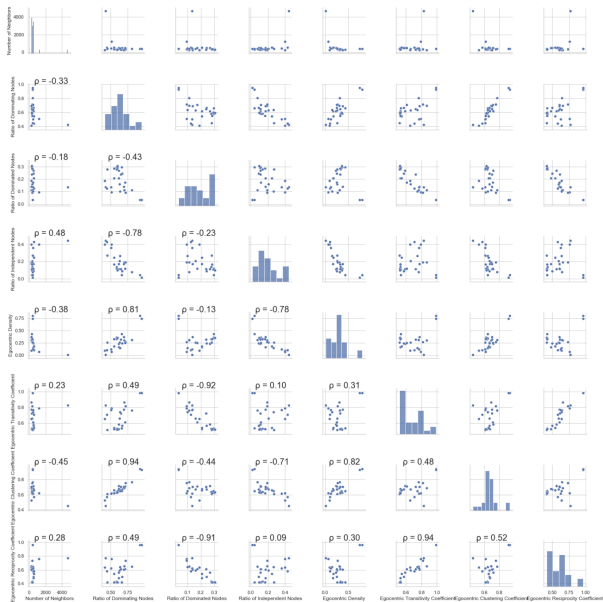
# Domination of 25 Selected Ego-Nets

	Node	Number of Neighbors	Ratio of Dominating Nodes	Ratio of Dominated Nodes	Ratio of Independent Nodes	Egocentric Density	Egocentric Transitivity Coefficient	Egocentric Clustering Coefficient	Egocentric Reciprocity Coefficient
0	The whole graph	4699	0.423	0.135	0.442	0.014	0.829	0.449	0.773
1	Alex Jones	491	0.618	0.268	0.114	0.235	0.584	0.717	0.564
2	Alt-right	378	0.631	0.161	0.208	0.257	0.658	0.669	0.592
3	American Enterprise Institute	338	0.584	0.277	0.139	0.333	0.527	0.638	0.429
4	Ben Shapiro	329	0.585	0.297	0.118	0.367	0.519	0.625	0.417
5	Billy Graham	274	0.695	0.113	0.193	0.306	0.866	0.689	0.657
6	Breitbart News	517	0.666	0.243	0.091	0.246	0.570	0.668	0.499
7	Cato Institute	238	0.414	0.188	0.397	0.098	0.654	0.526	0.637
8	Donald Trump	1208	0.509	0.093	0.399	0.066	0.792	0.619	0.780
9	Federalist Party	295	0.659	0.297	0.044	0.435	0.533	0.648	0.421
10	Federalist Society	516	0.619	0.207	0.174	0.164	0.524	0.674	0.479
11	Focus on the Family	330	0.601	0.293	0.106	0.346	0.531	0.645	0.422
12	Fox News	554	0.445	0.126	0.429	0.102	0.709	0.571	0.581
13	InfoWars	387	0.809	0.113	0.077	0.314	0.764	0.768	0.646
14	James Dobson	328	0.596	0.307	0.097	0.358	0.521	0.631	0.419
15	Liz Cheney	405	0.926	0.032	0.042	0.803	0.988	0.940	0.965
16	Marjorie Taylor Greene	423	0.950	0.033	0.017	0.740	0.985	0.927	0.961
17	Mitch McConnell	368	0.718	0.092	0.190	0.265	0.819	0.752	0.732
18	QAnon	297	0.648	0.238	0.114	0.320	0.724	0.705	0.614
19	Republican Study Committee	487	0.709	0.172	0.119	0.248	0.611	0.711	0.609
20	Ron Paul	469	0.636	0.100	0.264	0.148	0.744	0.646	0.639
21	Sean Hannity	396	0.451	0.280	0.270	0.261	0.514	0.609	0.419
22	Ted Cruz	551	0.547	0.207	0.246	0.180	0.543	0.657	0.542
23	The Heritage Foundation	260	0.690	0.138	0.172	0.376	0.772	0.703	0.607
24	The Wall Street Journal	470	0.505	0.134	0.361	0.124	0.770	0.614	0.626
25	Tucker Carlson	348	0.550	0.284	0.166	0.325	0.524	0.619	0.421

# Boxplots of 25 Selected Dominating Ego-Nets

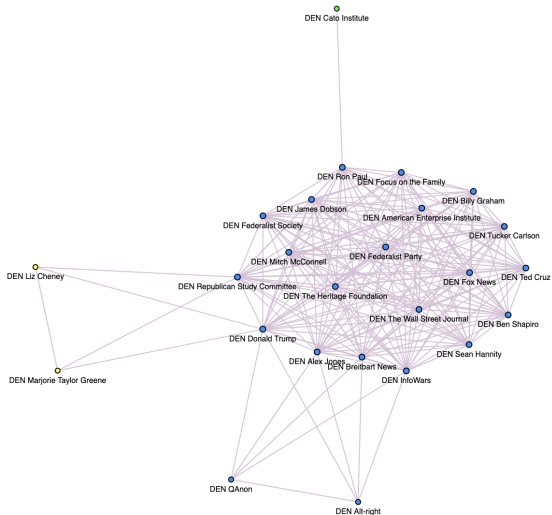


# Pairplots of 25 Selected Dominating Ego-Nets



# The Intersection Graph of 25 Selected Dominating Ego-Nets

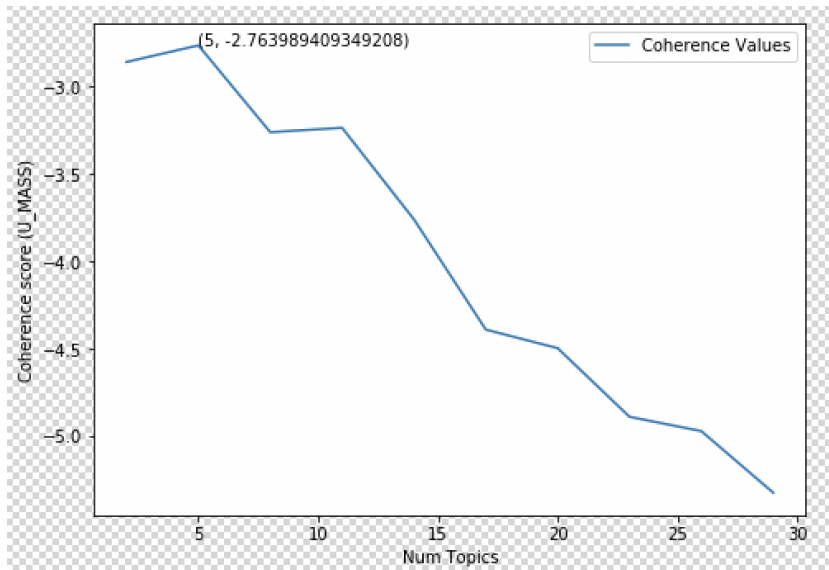
The intersection graph the top 25 selected DENs (colored in 3 Girvan-Newman communities)



# Topic Modeling on the Corpora of Summaries of All Wikipedia Pages

- ▶ The **corpora** is composed of the *summaries* of the 4,699 Wikipedia pages on Christian Nationalism.
- ▶ Using Python's `gensim` (under the standard parametrization `min-count=5`, `threshold=100`), a **corpora dictionary** was extracted, composed of 6,673 of terms (with stop-words removed after tokenization) and POS-tagged as Nouns.
- ▶ Thus, applying the **Latent Dirichlet Allocation (LDA)** topic model, we have succeeded in classifying the terms of the corpora dictionary into five (5) main topics.

## 5 Topics Maximizing the LDA Coherence Score of $u_{\text{mass}}$





# The 5 Topics of Terms

## Topic Modeling of terms in the Wikipedia pages of Christian Nationalism and Adjacent Groups

### Topic 1 (Written Communication)

work science society website  
culture research author economist  
site university student  
time member church world  
economic philosophy pastor school  
professor book year news  
scholar newspaper content  
editor topic publication  
organization politic program  
founder issue writer publisher  
life service view  
journalist magazine leader  
study history article theory  
movement

### Topic 3 (Civilian Organizations)

prison woman conspiracy theme  
belief man term family medium  
abortion marriage video founder  
view organization alt  
people right center  
war wing charge member  
law race leader opposition  
attention state vaccine  
group support event  
activist name  
website school public state activists union  
year movement politic  
culture life death child murder

### Topic 5 (Policy Organizations)

law activity investigation medium  
effort member support official  
state group issue tax  
movement group issue tax  
interest graduate research  
attack government security  
action right activist statement  
election policy business citizen  
family leader president  
reform advocacy trump people  
campaign time rally supporter  
freedom organization  
part network administration country

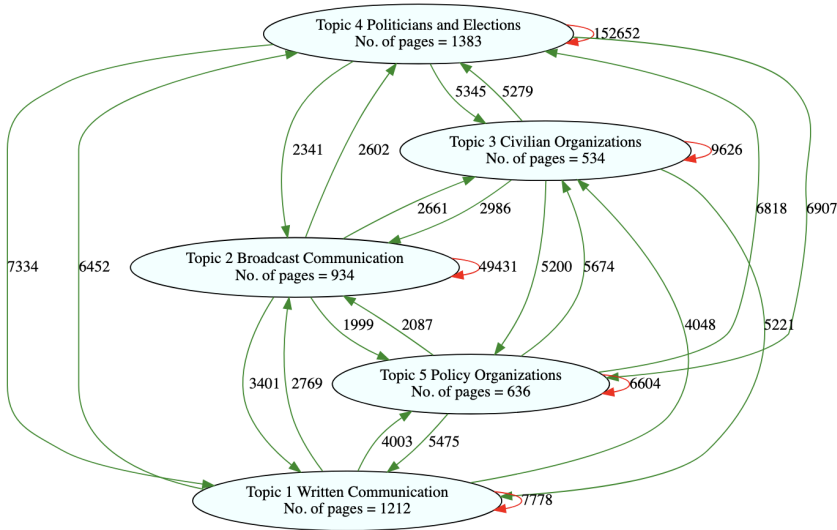
### Topic 2 (Broadcast Communication)

writer comedian studio part  
station program year  
film singer talk broadcast market  
power number television  
music cable company transmitter  
personality show channel award time  
artist album city comedy  
programming musician group country  
area radio career news family  
band tv affiliate network role  
actor host medium producer  
format

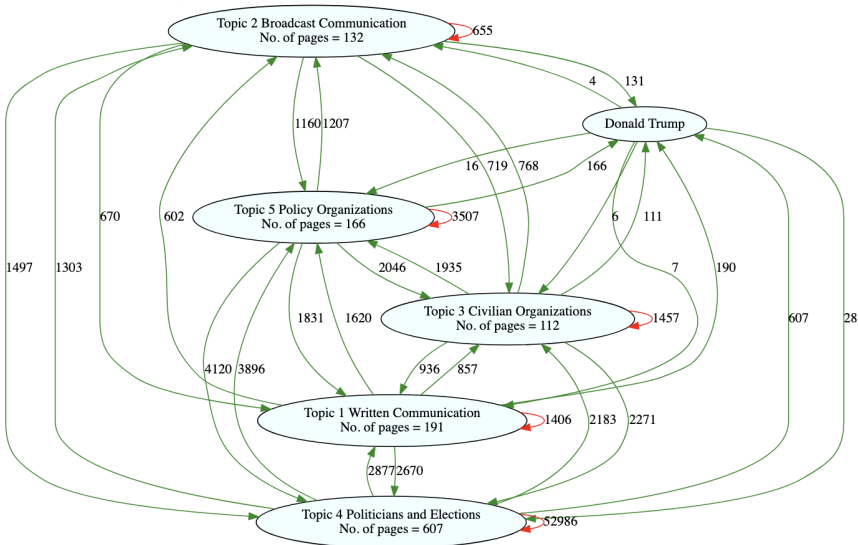
### Topic 4 (Politicians and Elections)

senator businessman parliament committee school  
lawyer representative  
city president case  
member term death state  
campaign position vote caucus  
incumbent chair history  
politician time  
office candidate career  
woman resignation governor house year  
election attorney  
race candidacy nominee  
party nomination seat law primary  
district

# The graph among the dominant topics of nodes in the digraph of the Wikipedia PageLinks on Christian Nationalism & Adjacent Groups



Donald Trump's connectivity with the dominant topics of alters in the digraph of the Wikipedia PageLinks on Christian Nationalism & Adjacent Groups



Thank You!

