

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.

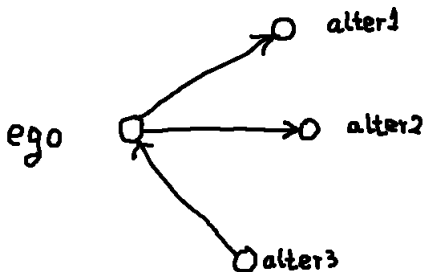
The Wikipedia PageLink Graph on CN

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

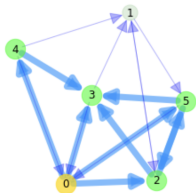
Definition

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

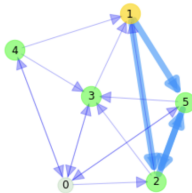
- ▶ The **egocentric subgraph** (or **ego-net**) of A is the subgraph of G formed by A (the **ego**) and all its friends or followers (**alters**).
- ▶ The **outward-egocentric subgraph** (or **out-ego-net**) of A is the subgraph of G formed by A (the **ego**) and all its friends (**alters**) (i.e., 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).

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

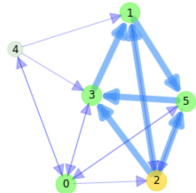
[1] outward-ego-net centered at 0



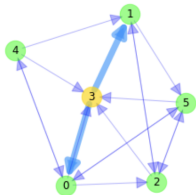
[2] outward-ego-net centered at 1



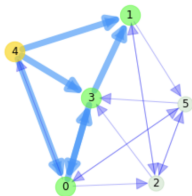
[3] outward-ego-net centered at 2



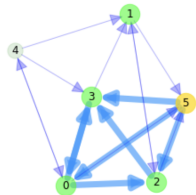
[4] outward-ego-net centered at 3



[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 . all alters-friends of B are alters-friends of A too.
2. In case (1) holds, page B is said to be an **egocentric dominated node (e-dominated node)** by the 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

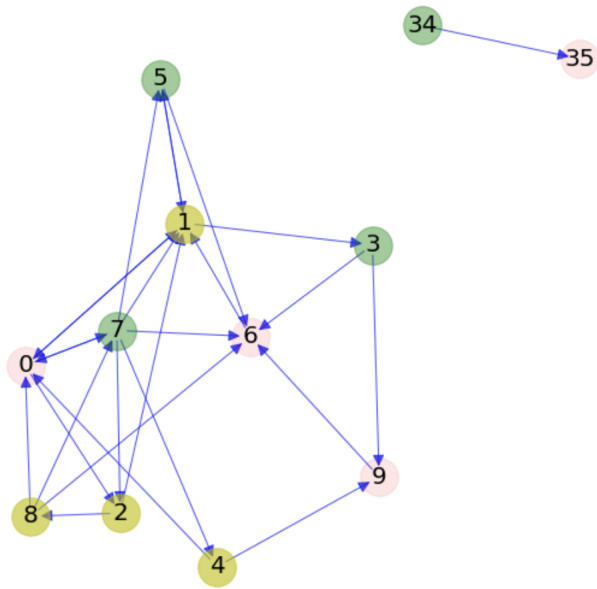
- ▶ A page A is an **e-dominating node** if and only if there exists at least one page B , which is friend of A , such that all friends of B are friends A too.
- ▶ A page B is an **e-dominated node** if and only if there exists at least one page A , which is follower of B , such that all friends of B 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 $EN(A)$.

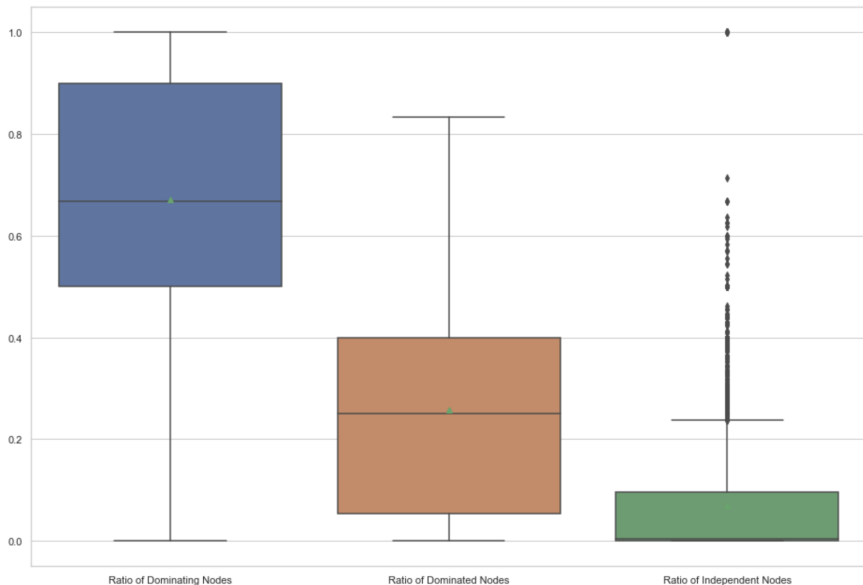
Then:

- ▶ “ $dom(A)$ 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 |

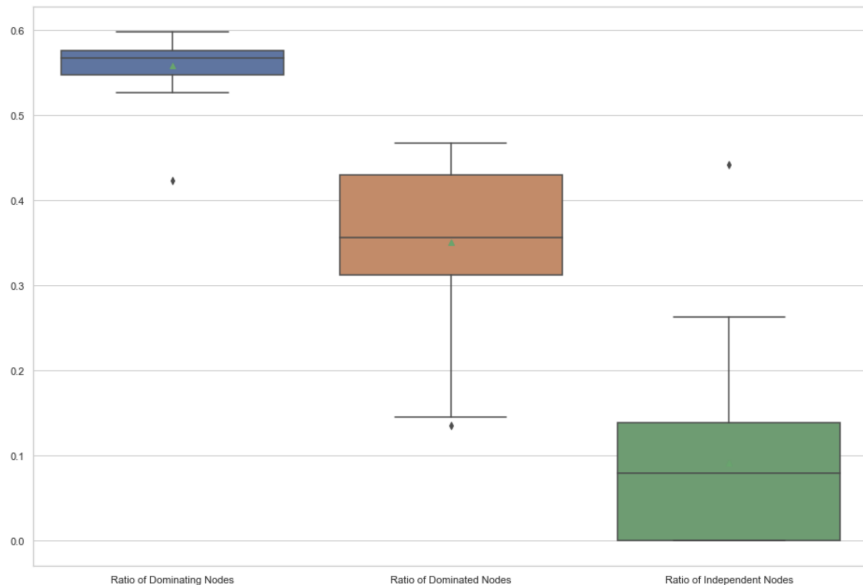
Boxplots of Ego-Domination



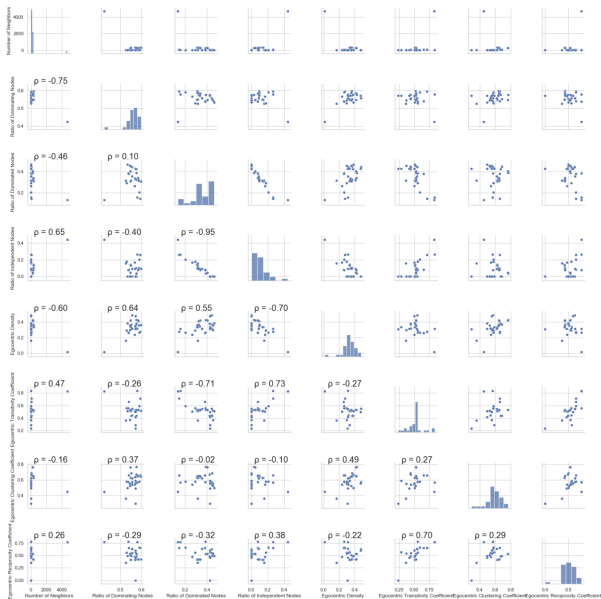
Domination of the Top 30 Ego-Nets with $\text{dom} \in (0.5, 0.6)$

| | 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 | 0.587 | 0.287 | 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 | 0.483 | 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 $\text{dom} \in (0.5, 0.6)$

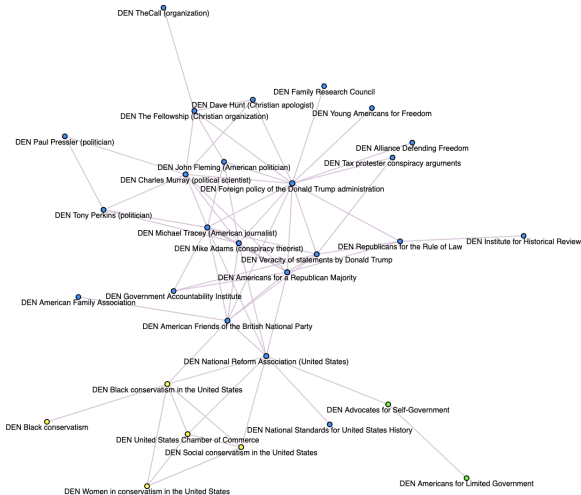


Pairplots of the Top 30 Dominating Ego-Nets with $\text{dom} \in (0.5, 0.6)$



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

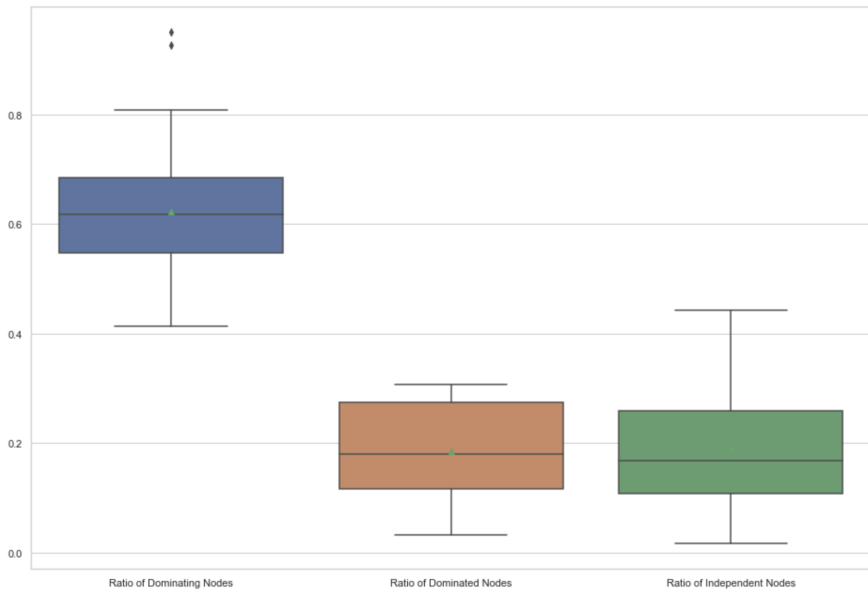
The intersection graph the top 30 DENs with dom in $(0.5, 0.6)$ (colored in 3 Girvan-Newman communities)



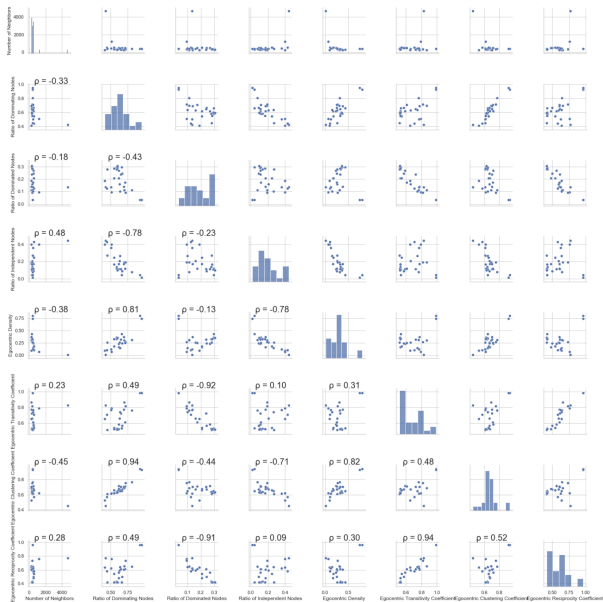
Domination of 25 Selected Ego-Nets

| | 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

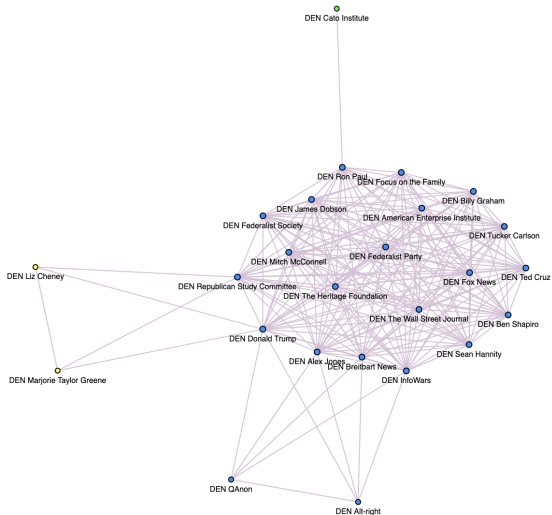


Pairplots of 25 Selected Dominating Ego-Nets



The Intersection Graph of 25 Selected Dominating Ego-Nets

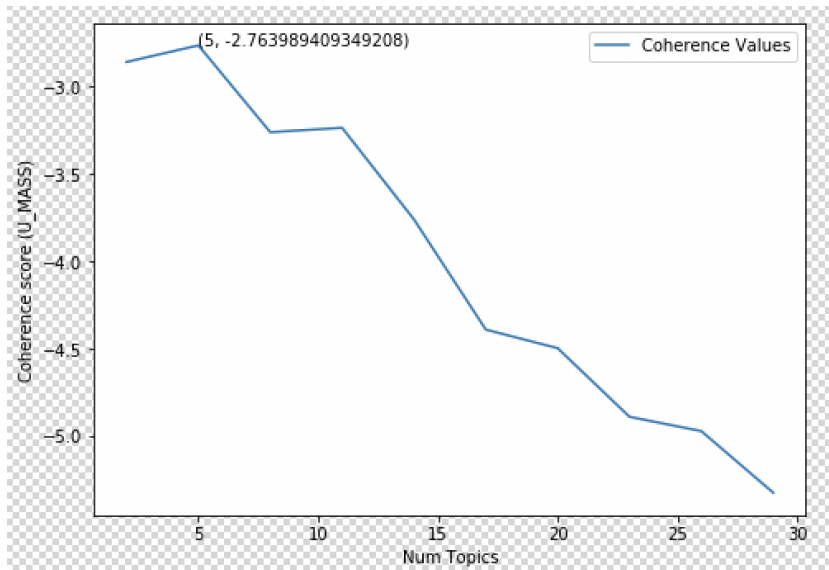
The intersection graph the top 25 selected DENs (colored in 3 Girvan-Newman communities)



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_{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
research culture author economist
site university company peoples student
time membership church world
economic philosophy pastor school
news newspaper book evangelist news
editor scholar publication content
organization politic program
founder issue writer publisher
life service view
journalist magazine leader
study history article theory

Topic 3 (Civilian Organizations)

prison woman conspiracy theory medium
belief man term marriage video founder
abortion
view organization alt
people right government value
war wing charge center church
law race leader opposition
attention state vaccine
group support event
website school while supremacist other sex
year movement politic
culture life death child murder

Topic 5 (Policy Organizations)

law member support medium center
effort state group tank official
movement number foundation research
intercardio government security
action activist statement
election right business citizen
family policy president
reform advocacy leader
campaign trump people
freedom time of election supporter
organization
part network administration society

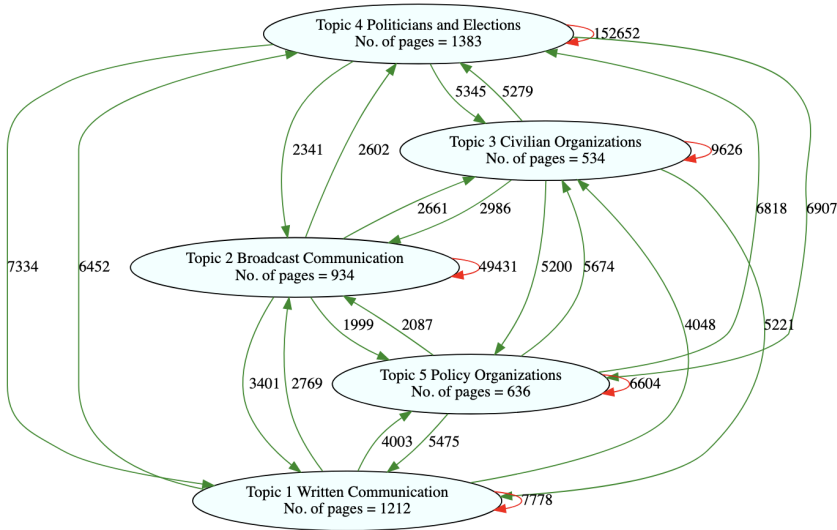
Topic 2 (Broadcast Communication)

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

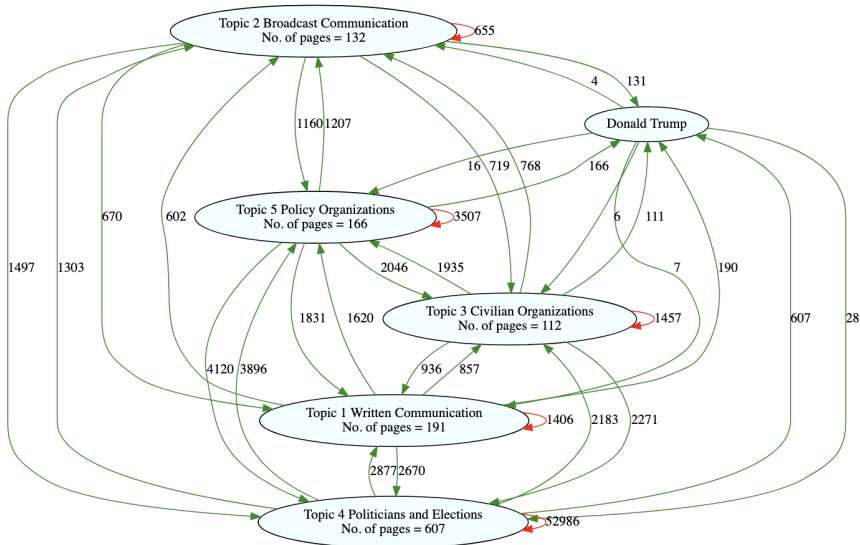
Topic 4 (Politicians and Elections)

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

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!

