Exploring Legislative Cosponsorship Networks in Stata with `nwcommands`

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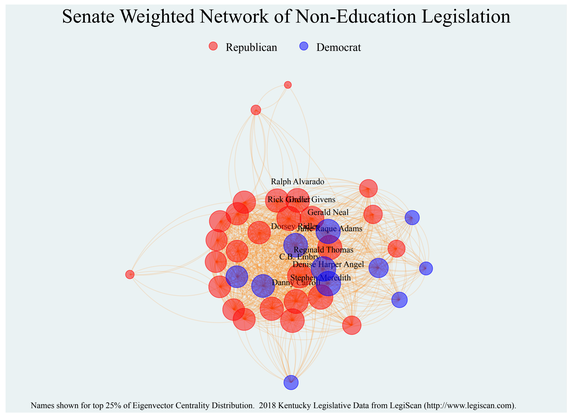

Figure 1: Senate NECN

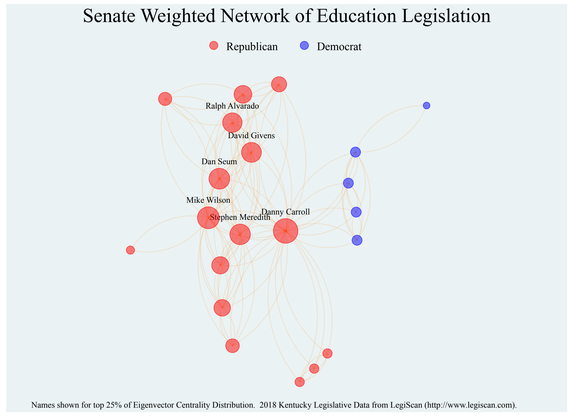

Figure 2: Senate ECN

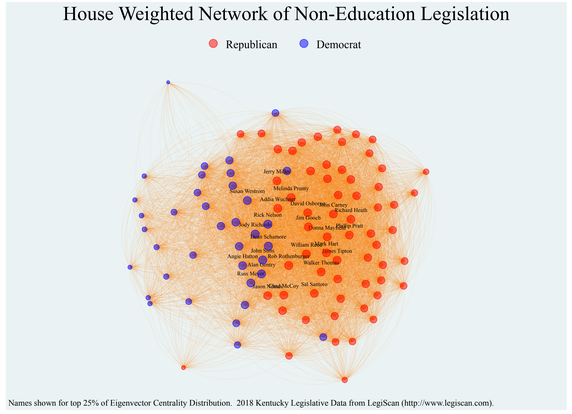

Figure 3: House NECN

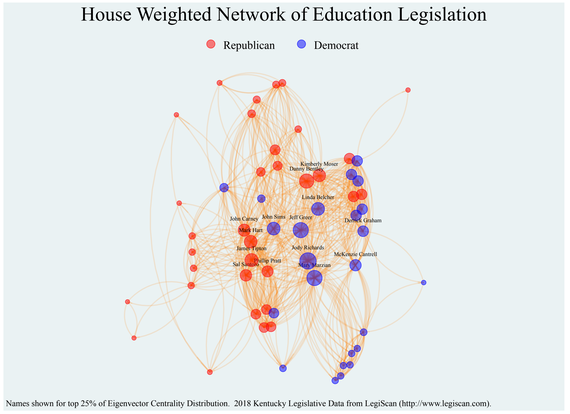

Figure 4: House ECN

Goals

1. Do the cosponsorship networks vary between education and non-education legislation?
2. Are legislative leaders highly influential in the context of legislation co-sponsorship?
3. Do the most influential legislators vary between education and non-education cosponsorship networks?

Introduction

Kentucky legislature is currently in the process of passing legislations regarding teacher pension and educational public spending reform. Through studying Kentucky's legislature cosponsorship network, we aim to determine which legislators have a tendency of cosponsoring educational legislature. Data for legislative cosponsorship network has been used to identify influential legislators (Fowler, 2006). Defining strong networks of legislators can assist groups lobbing for particular policies. Examining the relationship between lobbyist and legislators, Kroger and Victor (2009) found common donors between legislators that have more agreements in the legislative bill voting records.

Study Sample

Our sample of legislators and bills is summarized below, 1. Data were obtained to define Non-Education Cosponsorship Networks (NECN) and Education Cosponsorship Networks (ECN).

Table 1: *Distribution of Legislators and Bills Across Chambers and Party Lines.*

Chamber	Party	Legislators	Bill Type	Bills
Senate	Democrat	11	Education	45
Senate	Republican	27	Non-Education	243
House	Democrat	37	Education	45
House	Republican	63	Non-Education	560

Data

Data for Kentucky's 2018 regular session were retrieved from LegiScan (2018) (http://www.legiscan.com). We used regular expressions to identify education related legislation and to identify legislation from resolutions and chamber rules.
Once the data were assembled into an edgelist formatted data structure, we used commands from the `nwcommands` package (Grund, 2015) to construct the NECN and ECN networks for the house and senate.

Methods

We chose to focus on weighted networks in our analysis assuming that legislators who co-sponsor more legislation would be more influential and better reflects the social ties that exist between legislators co-sponsoring each others' bills (Hangal, MacLean, Lam, & Heer, 2010). Additionally, we selected the Eigenvector centrality measure to identify influence that each legislator has across the entire network (Landherr, Friedl, & Heidemann, 2010).

Results

The graphs above provide visual representations of the cosponsorship networks across chambers and legislation type. Only legislators with Eigenvector centrality scores greater than or equal to the 75^{th} percentile or higher are identified in the visualiations.

In figure 1 none of the senators holding leadership positions are identified as highly influential in the NECN. The majority whip (Mike Wilson) does appear to be an influential actor in the senate's ECN (figure 2). However, neither the chair or the vice chair of the senate's education committee appear to be empirically influential in either the NECN or ECN.

Unlike the senate, some house members in leadership positions do appear to be highly influential in the NECN (figure 3). More specifically, the house speaker pro-tempore and the chair of the house's education committee, David Osborne and John Carney respectively, appear to be influential in the broader legislative context of the house. In the context of education legislation in the house, the only house member in a leadership position to be empirically identified as influential is the education committee chair, John Carney (see figure 4).

Table 2: *Correlations Between Networks and Political Party.*

Chamber	Network	Network/Covariate	ρ	p-value
House	Education	Non-Education	0.38	0.0
House	Non-Education	Political Party	0.42	0.0
House	Education	Political Party	0.06	0.014
Senate	Education	Non-Education	0.46	0.0
Senate	Non-Education	Political Party	0.23	0.002
Senate	Education	Political Party	0.21	0.0

Although there are moderate correlations between the NECN and ECN in each chamber (see table 2), there are differences in the actors wielding the most influence between those networks. More importantly, the correlations between political party affiliation and cosponsorship networks may be an indicator of the partisan nature of the legislature in the Commonwealth of Kentucky.

Conclusion

While the estimated correlations in the cosponsorship networks are generally on the smaller side, there do appear to be some notable indicators of partisanship. For example, there appears to be almost no relationship between political party affiliation and the ECN in the house (table 2), while the correlation between the NECN and ECN in the Senate do not vary much. Most importantly, we find it interesting the legislative leaders do not appear to be highly influential in the context of cosponsoring of legislation. We believe a better understanding of cosponsorship networks and networks related to voting outcomes could provide a more effective means for educational organizations to deploy resources to more effectively advocate for educational policy changes and reforms.

References

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