Elite polarization in Argentina: A legislative co-sponsorship approach

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Elite polarization in multi-party systems

Existing approaches to elite/party polarization yield inconsistent results in multi-party systems and party system change.

Argentina is an interesting case characterised by party system transformation and fragmentation.

Goals of this research:

1. Descriptive: is elite polarization rising in Argentina, or not?
2. Methodological: how should we measure elite structural/group polarization in an increasingly fragmented and fluid party system?
3. Explanatory: what explains elite polarization levels? (Null results so far)

Elite polarization: limits of spatial measures

In Latin America, elite and expert survey measures show moderately high agreement on levels, but less on trends:
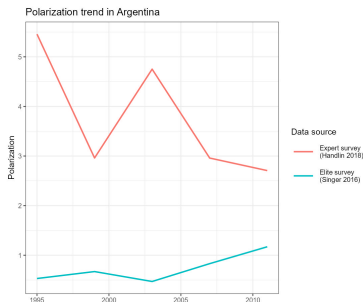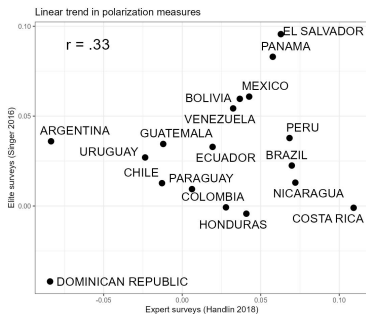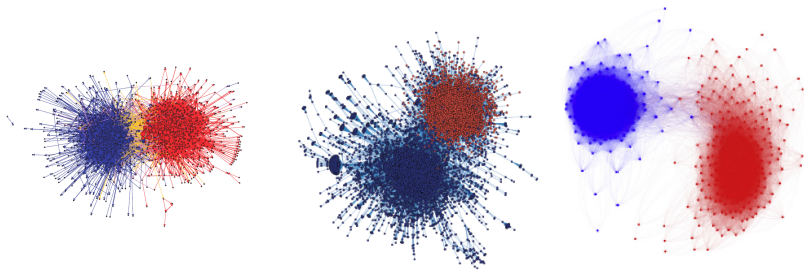

Elite and expert measures are not on the same scale; right hand figure refers only to trend.

Group/structural polarization

Two dimensions of polarization (Hohmann et. al. 2023):

1. "**opinions** of members **diverge** more strongly (opinion component)
2. people with **similar opinions cluster** with each other in **communities** (structural component)"

Group polarization in political blogs (Adamic and Glance 2005), Twitter (Conover et al 2011), Co-sponsorship networks (Neal 2020)
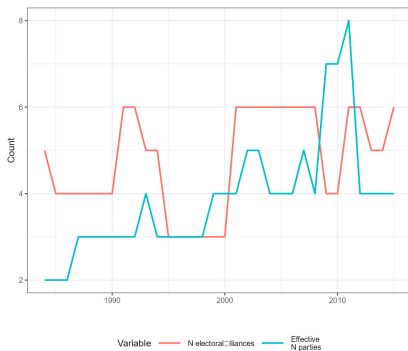
The Argentine context

Transition from (basically) two
party to multi-party system.

Many smaller parties ($\sim$ 30 in
1990s, $\sim$ 40 in the 2000s)

Grouped in much smaller number
of ad hoc electoral alliances.

Presence of many and changing
number of parties is a challenge
for group polarization measures.

Data

Sponsors (*firmantes*) of all legislation considered in Argentine Chamber of Deputies from 1983-2015.

- ▶ Calendar year rather than legislative session due to incomplete dates.
- ▶ Committee consideration = proxy for bill content.
- ▶ 2015-present data collection underway.

Co-sponsorship network measurement

Co-sponsorship network: set of dyadic relations formed by joint signing of legislation.

- ▶ Assumption: co-signing bill reflects similar policy preference and/or collaborative disposition towards other signatories.

Single co-sponsorship event may be weak signal of shared policy preference/collaborative disposition.

Stochastic degree sequence model (Neal 2014): legislators are connected if they co-sponsor more often than expected given their propensity to co-sponsor and bills' propensity to attract sponsors.

Polarization measures

1. **Modularity:** measures the extent to which network ties fall within rather than between groups
   - ▶ High modularity = no mixing, all ties are within group
   - ▶ used previous studies of polarization in co-sponsorship networks (Neal 2020, Zhang 2008)
   - ▶ but, sensitive to differences in network structure and the number of groups.

2. **(Nominal) assortativity:** observed modularity standardized by the maximum possible modularity in a network with a given density and number of groups (Newman 2002).
   - ▶ igraph::assortativity_nominal

Two key methodological choices

1. Calculate polarization based on given party memberships or from subgroups/communities inferred from network data?
   - ▶ existence of many smaller parties may lead to underestimation of polarization using party memberships
   - ▶ from a network perspective, it is natural to infer groups from behavior

2. If inferred communities, how to do this?
   - ▶ Modularity maximization community detection algorithms criticized for over-fitting (Peixoto 2022).
   - ▶ Stochastic blockmodels specify a generative model by fixing the number of groups.
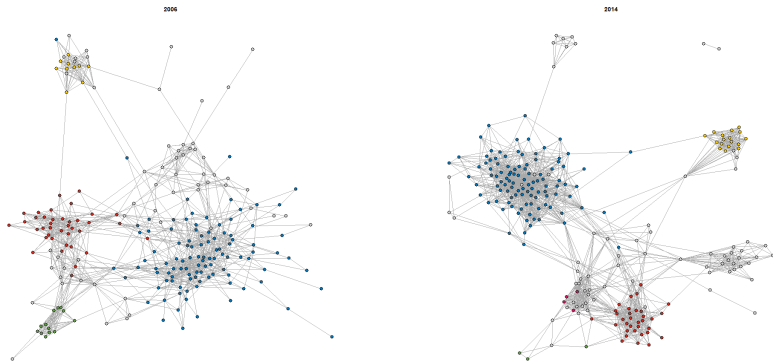
SDSM networks: 1984, 1993

1984

1993
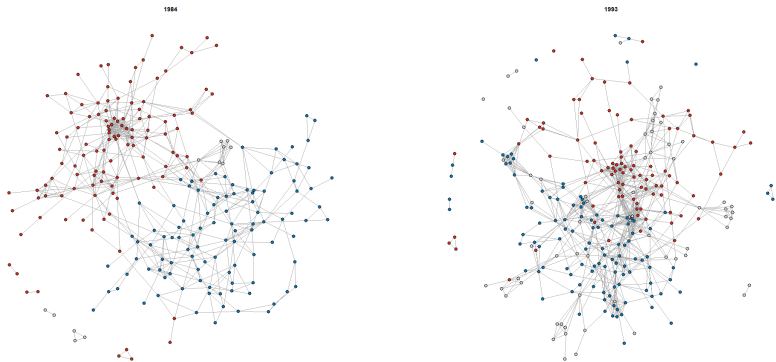
Blue: PJ/Peronist; Red: Union Civica Radical
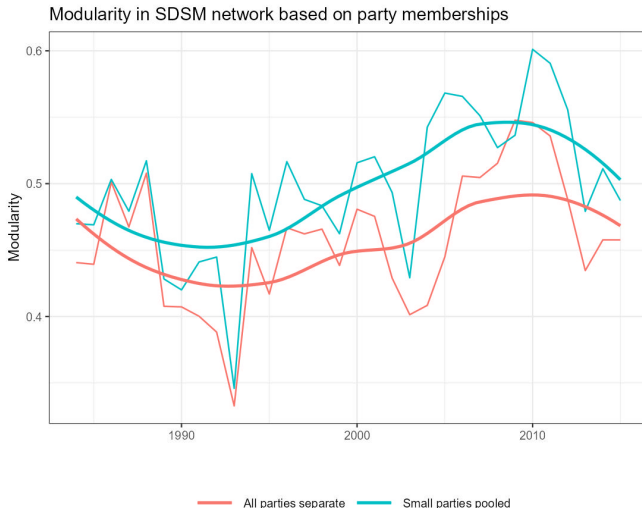
SDSM networks: 1998, 2003
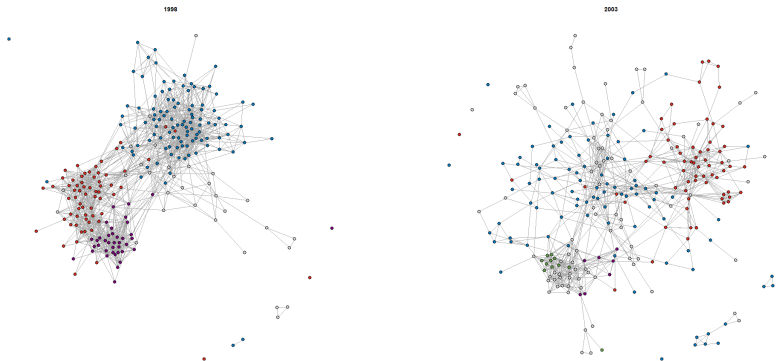
Blue: PJ/Peronist; Red: Union Civica Radical; Purple: FREPASO; Green:
Coalición Cívica/ARI

SDSM networks: 2006, 2014

Blue: PJ/Peronist; Red: Union Civica Radical; Yellow: Pro/Union Pro

Party polarization: modularity

Modularity in SDSM network based on party memberships

Compare to Neal (2020): co-sponsorship network modularity in the US House: from ∼ .3 in 1970 to ∼ .5 in 2015.

Party polarization: assortativity

Assortativity in SDSM network based on party memberships
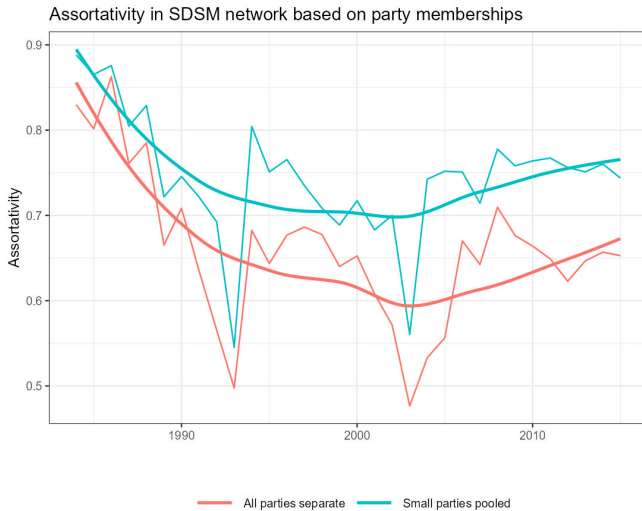
Party polarization: summary

1. On modularity basis, polarization rose substantially.
2. On assortativity basis, polarization was close to maximal in 1980s and only slightly higher in 2000s compared to 1990s.
3. This is because maximum possible modularity (denominator) rose faster than the numerator due to the increasing number of parties.
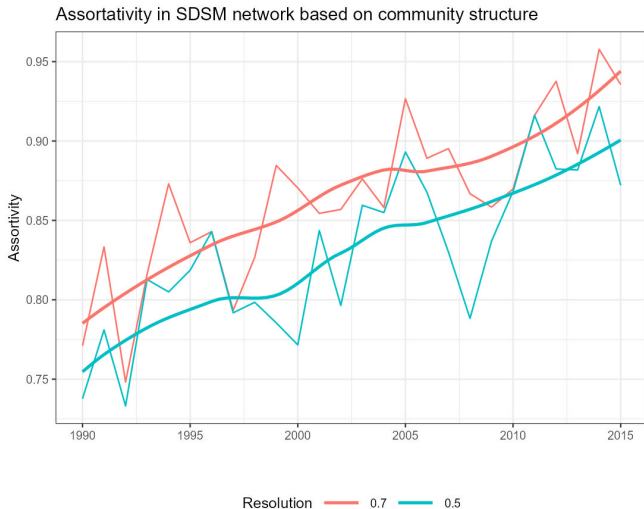
Informal group polarization: modularity

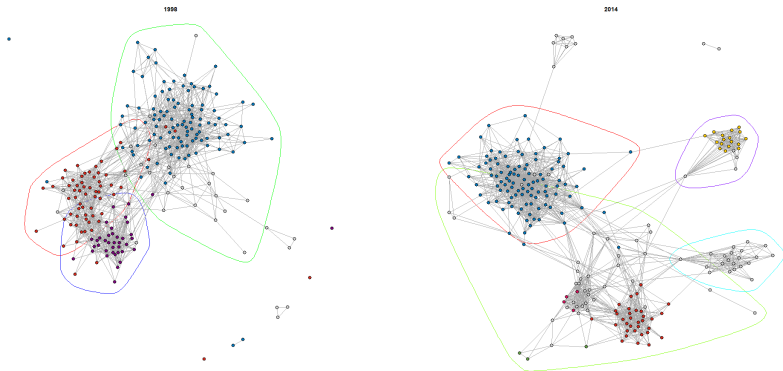Modularity in SDSM network based on community structure
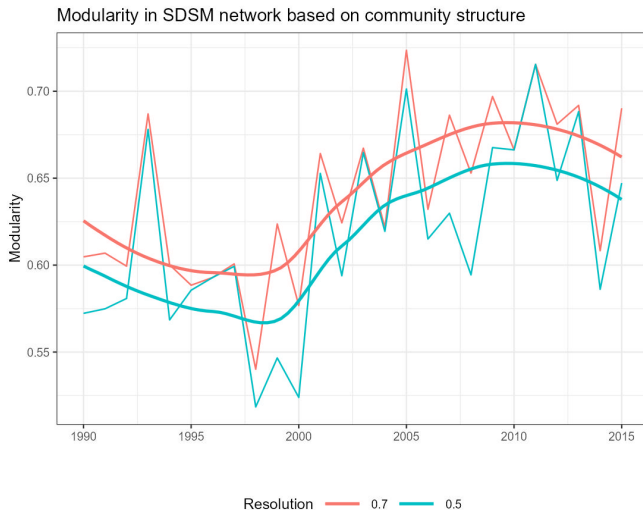
Community detection algorithm performs poorly for 1986-1988 due to decline in
legislative activity. I focus here on period since 1990.

Informal group polarization: assortativity

Assortativity in SDSM network based on community structure

Informal group group polarization

Overfitting and the stochastic blockmodel approach

I fit stochastic blockmodels assuming two different generative models:

1. Number of groups = 1 + number of effective parties
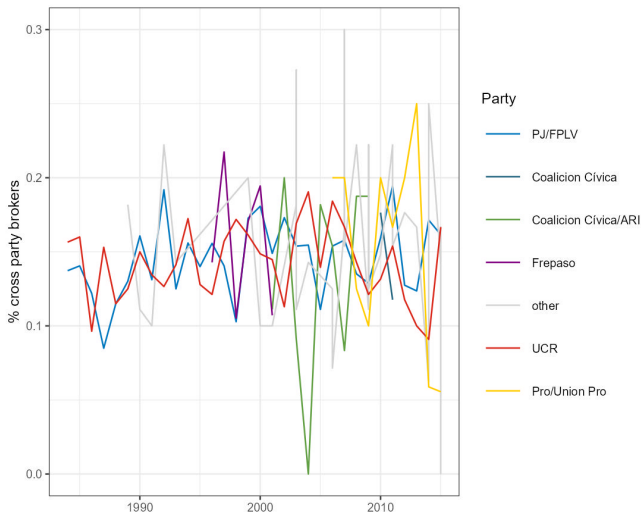2. Number of groups = 1 + number of electoral alliances

Results:

- ▶ Model fit is disappointing.
- ▶ Conditional on this, results suggest rising polarization, but not as high.

Next steps: assortative stochastic blockmodel (Zhang and Peixoto 2020) to address model fit.

Why is elite polarization rising? Bill content
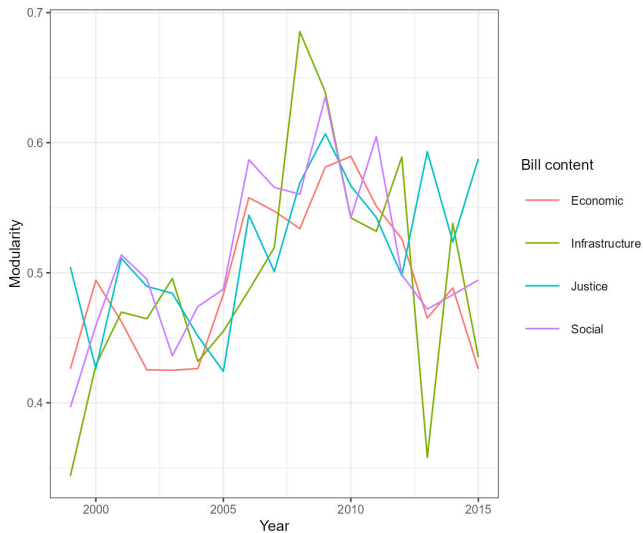
Why is elite polarization rising? Cross-party brokerage

Percentage of legislators in each party with a Gould-Fernandez 'representative' brokerage score greater than one SD above mean

Conclusions

1. Co-sponsorship networks show rising level of elite polarization in Argentina not detected by other approaches.
2. In a fragmented context, measures based on party membership may underestimate group polarization.
3. On an informal group basis, elite polarization has risen substantially, approaching a theoretical maximum.
4. Despite criticism of standard community detection approaches, they perform well in this context, while stochastic blockmodeling approach requires a more refined model
5. Neither particular policy areas nor changing rates of cross-party brokerage appear to account for increasing elite polarization.

Additional slides

Stochastic degree sequence model

Intuition:

- ▶ Estimate the probability of a tie between legislator i and j given 1) the number of legislators they co-sponsor with and 2) the number of sponsors legislation attracts.
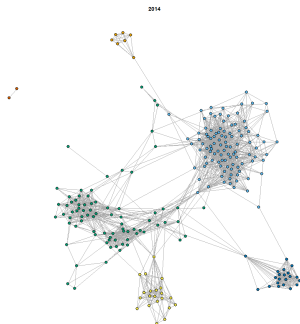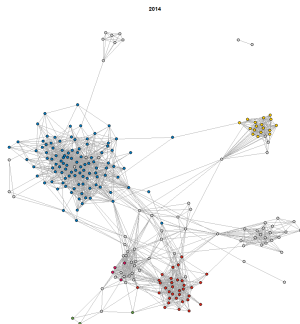- ▶ Define tie from i to j if i sponsors legislation also supported by j more often than expected by chance.

Previously used by Neal (2020) to analyse polarization in co-sponsorship networks in the United States.

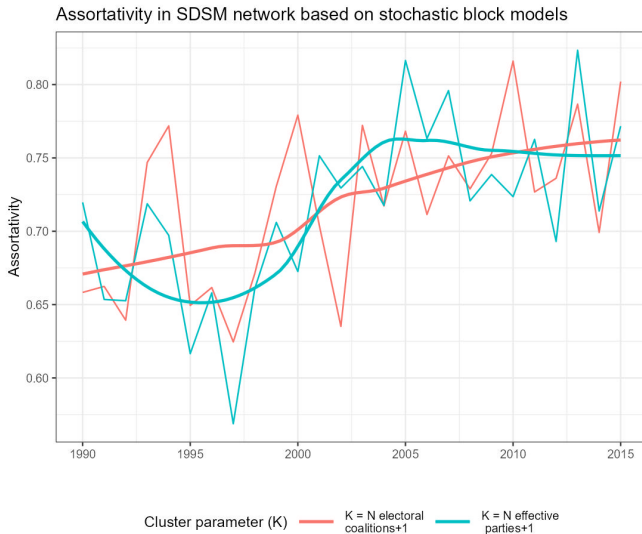# Leiden community detection results: alternative visualization (1998)
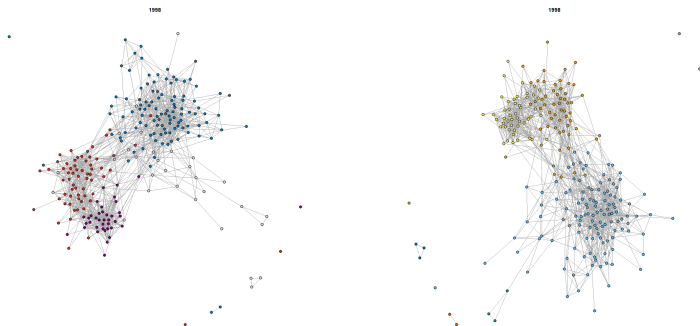
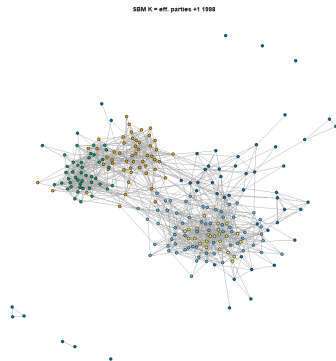# Leiden community detection results: alternative visualization (2014)

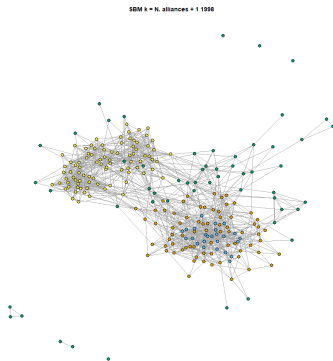# Informal group polarization: modularity (stochastic blockmodel results)

Modularity in SDSM network based on stochastic block models
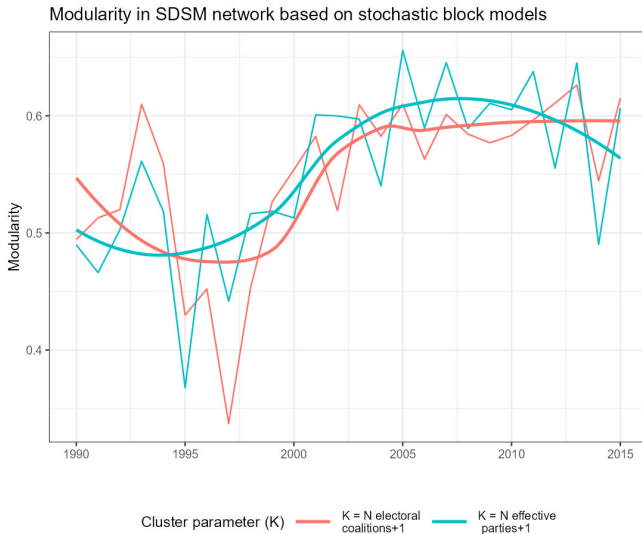
Informal group polarization: assortativity (stochastic blockmodel results)

Assortativity in SDSM network based on stochastic block models

Stochastic blockmodel fit (1998)

SBM k = N. alliances + 1 1998

SBM K = eff. parties +1 1998

Stochastic blockmodel fit (2014)

SBM k = N. alliances + 1 2014

SBM K = eff. parties +1 2014