Blockmodels/Positional Analysis
Implementation and Application

By Yulia Tyshchuk
Tracey Dilacsio
Articles

- Wasserman and Faust – Chapter 12


Social Network Analysis: Chapter 12.

By Stanley Wasserman and Katherine Faust
Position versus Role

- *Position* refers to a collection of actors and looks at the structure of an entire group.
- *Role* refers to the ways in which the occupant of a position relates to the occupants of other positions.
Levels of Role Analysis

- **Global role structures**
  - Describes an entire group

- **Local roles**
  - Examines particular subsets of actors within a group (for example, a subset of approximately structurally equivalent actors) for ways in which the position is tied to other positions in the network

- **Individual or ego roles**
  - “...associates a role with each actor strictly on the basis of patterns and regularities in his or her ‘personal’ network.”
Equivalence in Networks

- Actors who are equivalent are assigned to the same equivalence class or position.
- There are several different ways to define equivalence:
  - Structural equivalence
  - Automorphic and isomorphic equivalence
  - Regular equivalence
  - Local role equivalence
  - Ego algebras
Equivalence Relations

- Each equivalence definition specifies an equivalence relation, which has the following properties:
  - Symmetric (\(i = j\) if and only if \(j = i\))
  - Reflexive (\(i = i\))
  - Transitive (if \(i = j\) and \(j = k\), then \(i = k\))
- An equivalence relation defines a *partition* by creating subsets of entities that are mutually exclusive and exhaustive
  - All entities within a class are equivalent, and entities from different classes are not equivalent
Structural Equivalence

- Two actors are *structurally equivalent* if and only if they have identical ties to and from identical other actors.

- *Role* is a general construct.
  - We need to be able to describe a role in a way that is independent of the identities of the particular individuals involved.
  - Structural equivalence does not allow for this.
The only pairs of actors that are structurally equivalent are \{5,6\} and \{8,9\}. Everyone else is on their own.
Automorphic Equivalence

- Equivalent actors occupy indistinguishable structural locations in a network.
- Automorphically equivalent nodes are identical with respect to all graph theoretic properties – the only difference is the label/name attached to the node.
Automorphic Equivalence

- Looser definition than structural equivalence
  - Can compare actors within an organization, and between organizations (isomorphic)
  - People from different populations can occupy the same social positions – this definition allows us to make that comparison

- However, equivalent nodes must have a one-to-one “mapping” onto one another
  - For example, corporate managers who oversee differently-sized departments would not be automorphically equivalent
Automorphic Equivalence

- Nodes belong to the same “orbit” if they can be mapped to one another in some automorphism or isomorphism.
  - Nodes in the same orbit belong to the same automorphic equivalence position.
- There is currently no known fast algorithm that guarantees identification of automorphically equivalent nodes in all graphs.
  - Automorphically equivalent nodes must have identical graph theoretic properties, but nodes could have identical properties but still not be automorphically equivalent.
- Example: Managers can be isomorphically equivalent if they receive orders from the same boss, and each supervise two employees (even if those employees are four different people).
Automorphic Equivalence

Sets \{2,4\} and \{5,6,8,9\} are automorphic equivalence classes. Everyone else is on their own.
Regular Equivalence

- Actors who occupy the same social positions relate in the same ways with other actors who are themselves in the same social position
  - Ties aren’t necessarily identical or isomorphic in a strict graph-theoretical sense
  - Solves the problem of structural equivalence where we might miss observing actors in same positions if one manager supervises two employees and the other supervises three.
- Regular equivalent actors have identical ties to and from other equivalent actors
  - There may be multiple ways to assign actors to equivalence classes (including structural equivalence and automorphic equivalence)
  - The partition with the fewest equivalence classes is called the *maximal regular equivalence*
Regular Equivalence

Sets of \{1\}, \{2,3,4\} and \{5,6,7,8,9\} is one example of a regular equivalence.
Regular Equivalence

- If there is no direction in the graph and no isolates, the maximal regular equivalence class consists of a single equivalence class containing all nodes.

- A *neighborhood* consists of all nodes adjacent to the particular node of interest.
  - Nodes that are regularly equivalent must have the same equivalence classes of nodes in their neighborhoods across all relations.
Regular Equivalence

Can have classes of 
{1,2,3,4}; or {1,3,4} and {2}
Regular Equivalence

- Blockmodeling consists of mapping actors into equivalence classes, and then determining the existence and/or nature of the tie between each pair of positions.
  - One-blocks
    - To become a 1-block in the image matrix, all actors in $B_m$ must have a tie to at least one actor in $B_p$
  - Zero-block
    - A perfect zero-block requires that the corresponding sub-matrix be filled entirely with zeros
Regular Equivalence

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Regular Equivalence
Regular Equivalence

- Can use methods to find sets of actors who are “nearly” regularly equivalent.

Several ways to measure regular equivalence:
- For all pairs of actors in a regular equivalence class, their ties to and from all other equivalence classes must “match.”
  - One measure is how well actors within a regular equivalence class “match”
- REGE algorithm
  - Iterative procedure where estimates of the degree of regular equivalence between pairs of actors are adjusted in light of the equivalences of the alters adjacent to and from members of the pair.
Regular Equivalence

- Compare the numerator (the actual matches) to the denominator (the maximum possible value of the numerator if the matching was perfect).
- This quantity ranges from 0 to 1 (with a 1 being obtained if I and j are perfectly regularly equivalent).
- Need to run the procedure multiple times. Three is commonly accepted, but the actual appropriate number depends on substantive and theoretical requirements.

\[
M_{ij}^{t+1} = \frac{\sum_{k=1}^{g} \max_{m=1}^{g} \sum_{r=1}^{R} M_{km}^{t} (i_{jr} M_{kmr}^{t} + j_{ir} M_{kmr}^{t})}{\sum_{k=1}^{g} \max_{m}^{*} \sum_{r=1}^{R} (i_{jr} \text{Max}_{kmr} + j_{ir} \text{Max}_{kmr})}
\]
Regular Equivalence

- An Example using the Advice and Friendship relations from the Krackhardt high-tech managers data
- Used the REGE routine in UCINET 3, three iterations, and included both relations and their transposes in the calculations.
- From the matrices and the dendrograms, we can see the regular equivalence classes.
Regular Equivalence
Types of Ties

- For a pair of positions, the *role relation* is the collection of ways in which members of that pair of positions relate to each other.
- For a single position, the collection of all the ways in which an occupant of a particular position relates to others in other positions is called the *role set* of the position.
  - Look at both primitive and compound relations
- Each relation (total number denoted as $R^+$) can be presented in a sociomatrix
- The total relationship can be summarized in a *super-sociomatrix* (also called a *relation box*)
Types of Ties

Figure 12.6 on page 486 (from Ch. 11)
Types of Ties

- $1 \xrightarrow{L} 1$: $\mathcal{S}_{1,1} = \{L\}$
- $1 \xrightarrow{H} 2$, $1 \xrightarrow{HL} 2$: $\mathcal{S}_{1,2} = \{H, HL\}$
- $1 \xrightarrow{H} 3$, $1 \xrightarrow{HL} 3$: $\mathcal{S}_{1,3} = \{H, HL\}$
- $1 \xrightarrow{HH} 4$: $\mathcal{S}_{1,4} = \{HH\}$
- $1 \xrightarrow{HH} 5$: $\mathcal{S}_{1,5} = \{HH\}$
- $1 \xrightarrow{HH} 6$: $\mathcal{S}_{1,6} = \{HH\}$
Local Role Equivalence

- *Role equivalent* actors have identical role sets.
- Actors 2 and 3 are role equivalent; Actors 4, 5, and 6 are role equivalent; and Actor 1 is on its own.
Types of Ties

Role relations:
Actor 1: $\mathcal{S}_{1,1} = \{L\}, \mathcal{S}_{1,2} = \mathcal{S}_{1,3} = \{H, HL\}, \mathcal{S}_{1,4} = \mathcal{S}_{1,5} = \mathcal{S}_{1,6} = \{HH\}$
Actor 2: $\mathcal{S}_{2,1} = \{HH, \emptyset\}, \mathcal{S}_{2,2} = \mathcal{S}_{2,3} = \{L\}, \mathcal{S}_{2,4} = \{H\}, \mathcal{S}_{2,5} = \mathcal{S}_{2,6} = \{HL\}$
Actor 3: $\mathcal{S}_{3,1} = \{HH, \emptyset\}, \mathcal{S}_{3,2} = \mathcal{S}_{3,3} = \{L\}, \mathcal{S}_{3,4} = \{HL\}, \mathcal{S}_{3,5} = \mathcal{S}_{3,6} = \{H\}$
Actor 4: $\mathcal{S}_{4,1} = \mathcal{S}_{4,2} = \mathcal{S}_{4,3} = \{H, HL, HH, \emptyset\}, \mathcal{S}_{4,4} = \mathcal{S}_{4,5} = \mathcal{S}_{4,6} = \{L\}$
Actor 5: $\mathcal{S}_{5,1} = \mathcal{S}_{5,2} = \mathcal{S}_{5,3} = \{H, HL, HH, \emptyset\}, \mathcal{S}_{5,4} = \mathcal{S}_{5,5} = \mathcal{S}_{5,6} = \{L\}$
Actor 6: $\mathcal{S}_{6,1} = \mathcal{S}_{6,2} = \mathcal{S}_{6,3} = \{H, HL, HH, \emptyset\}, \mathcal{S}_{6,4} = \mathcal{S}_{6,5} = \mathcal{S}_{6,6} = \{L\}$

Role sets:
$\mathcal{S}_1^* = \{\{L\}, \{H, HL\}, \{HH\}, \{\emptyset\}\}$
$\mathcal{S}_2^* = \mathcal{S}_3^* = \{\{L\}, \{H\}, \{HL\}, \{HH, \emptyset\}\}$
$\mathcal{S}_4^* = \mathcal{S}_5^* = \mathcal{S}_6^* = \{\{L\}, \{H, HL, HH, \emptyset\}\}$.
Local Role Equivalence

- Measuring Local Role Dissimilarity
  - It is unlikely that two actors will be perfectly role equivalent.
  - There is a measure that focuses on how well the role relations in two actors’ role sets “match” each other.

\[
d(S_{ik}, S_{jl}) = \sum_{r=1}^{R+} |x_{ikr} - x_{jlr}|.
\]

- This sum is a count of the number of relations (out of a total possible $R+$) on which $i$’s tie to alter $k$ is different from $j$’s tie to alter $l$. 
Local Role Equivalence

We can also calculate the overall degree of role equivalence of two actors:

\[ D(\mathcal{L}_i^*, \mathcal{L}_j^*) = \sum_{k=1}^{g} \min_{l} d(\mathcal{L}_{ik}, \mathcal{L}_{jl}) + \sum_{l=1}^{g} \min_{k} d(\mathcal{L}_{jl}, \mathcal{L}_{ik}). \]
Role Equivalence

- Role equivalence can be generalized to measure the role equivalence of actors from different networks, so long as the same relations are measured in both networks.
- Role equivalence does not require that role equivalent actors be tied by the same role relations to actors who are themselves role equivalent.
- Role equivalence is therefore more general than regular equivalence.
Role Equivalence

Example 12.6

- Included analysis of all simple and compound relationships up to length 2, and excluded transposes
- There were 6 relations in total
- Since a measure of 0 indicates a perfect role equivalence, we can see from the matrix that there are three subsets of role equivalence in this network.
Role Equivalence

- Krackhardt high-tech manager data
  - Included words up to length three, but did not include the transposes
  - There are 14 primitive and compound relations in total
  - We can identify five subsets of approximately role equivalent managers
    - When we cross-reference this chart with what we know about the actors themselves, we see that the subsets make sense
Role Equivalence
Ego Algebras

O Proposed by Breiger and Pattison (1986) as a way to model individual actors’ roles and group role structure simultaneously
O Consists of two major parts:
  O Describes the perspectives of the individual actors to study which actors have similar roles or positions in a network
  O Summarizes the relational features that are common to all members of the network
Ego Algebras

- We look at compound relations (combinations of two relations, e.g., “a friend of a friend”), which can be represented in a right multiplication table:
  - Row elements are vectors of ties from the actor on each relation
  - Column elements are the sociomatrices of the primitive relationships
- Two relations may be identical from the perspective of an individual actor without being identical for the entire group
Ego Algebras

Definition of Ego Algebras

- These figures present the equations among relations and the right multiplication table expressing the composition of relations from the given actor’s perspective.

- We can see from the figure that the divided subsets (\{1\}; \{2,3\}; \{4,5,6\} respectively have identical equations and right multiplication tables.
Ego Algebras

**actor 1: \{H, HL\}\{L\}\{HH\}\{∅\}\**

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**actors 2 and 3: \{H\}\{L\}\{HL\}\{HH, ∅\}\**

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**actors 4, 5, and 6: \{L\}\{H, HL, HH, ∅\}\**

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Ego Algebras

O Equivalence of Ego Algebras
  O Two actors are ego-algebraically equivalent if the equivalence among relations and the composition of relations are the same from each actor’s perspective.

O Measuring Ego Algebra Similarity
  O As with other equivalency relations, we can calculate how ego-algebraically similar two actors are. This uses a similar approach of comparing the partitions defined by the two ego algebras for two actors.
Ego Algebras

Examples

- Applies the routine JNTHOM in the program ROLE.
- Figure 12.6: Three subsets of actors who are ego-algebraically equivalent (as seen previously)
Ego Algebras

- Krackhardt high-tech managers data
  - Create a matrix of the distances between the ego algebras of the 21 managers in the dataset.
  - This can then be represented in a dendrogram using complete hierarchical clustering.
The Japanese Corporate Network: A Blockmodel Analysis.

By Michael L. Gerlach
Japanese Corporate Structure

- Highly visible clique-like patterns based on intercorporate alliances, family-centered holding companies, etc.
- Question: Do financial institutions play a central role in networks of directorships, stock ownership, and corporate control as they do in the U.S.?
Intercorporate Alliances

- Much interconnectedness can be traced back to the period surrounding WW2.
- Many companies had a complex structure of interlocking ownership, where several companies would jointly own percentages of each other’s companies.
- Structure became less hierarchical following the war, but the ties between the lower-level companies continued to exist.
Intercorporate Alliances
Intercorporate Alliances
Financial Centrality

- As with the U.S., banks and other financial institutions appear to play a central role in corporate connections in Japan
  - Existing companies set up their own financial institutions
  - Independent financial institutions develop close ties with other companies to ensure a client base
  - As holding companies and family businesses were broken up post-war, banks and financial institutions assumed an even more central position
- Unlike in the U.S., Japanese banks can hold up to 5% total equity in non-financial firms (this was as high as 10% up until 1987)
Financial Centrality

- This will be reflected in the data in several ways:
  - Financial institutions will differ from industrial corporations in their roles within the network
  - Blocks dominated by financial firms are disproportionately linked to the remainder of the network
  - Several studies have already shown that financial firms are the most central actors in directorship networks
Financial Centrality
Industrial Interdependence

- Firms use exchange of directors and partial equity ownership as a means of controlling the external uncertainty that comes from dealing with outside trading partners and competitors.
  - Japanese firms have a wide variety of forms of cooperation among themselves (although are less likely to use the American mergers-and-acquisitions approach).
  - It is more difficult to identify the connections between competitors.
Industrial Interdependence

- Look at the extent to which blocks of industrial firms are senders and receivers of ties to other blocks containing firms in the same or closely related industries.
  - If direct connections, we will see that in the connections between blocks
  - If indirect connections, they may tend to cluster together in the same structurally equivalent blocks
Methods

- Includes 60 of Japan’s top industrial and financial enterprises:
  - Largest 40 industrial companies (measured by sales for 1980)
  - Largest 20 financial institutions (measured by assets in 1981)
    - Top 10 commercial banks
    - Top 5 trust banks
    - Top 5 non-life-insurance companies.

- Analysis considers three different intercorporate relations:
  - Bank borrowing
  - Equity ownership
  - Dispatched directors
Methods

- These three network variables were coded for the 60 firms in the sample. Three 60 x 60 matrices were created across three different types of directional ties.
- Blockmodeling was chosen for analysis:
  - Can handle both direct and indirect relationships
  - Can handle several types of ties simultaneously
  - Can partition networks into structurally related groups and show the relationships within and between these groupings.
Methods

- Four steps of analysis:
  - The three 60 x 60 matrices were stacked and analyzed together to derive spatial mappings of overall network structure (to observe general patterns)
  - Stacked matrices were used to create structurally equivalent blocks by CONCOR partitioning
  - Relationships within and between blocks were analyzed based on their absolute and relative densities. Analysis considered separate densities for debt, equity, and directorship ties, as well as a merged matrix for equity and directorship.
  - A subset of industrial firms was analyzed in CONCOR partitions to see if they were clustered based on *keiretsu* affiliation or if they were vertically independent.
Methods

O Spatial map shows the MDS of Euclidean distances of the 60 firms, based on the stacked matrices of the original three variables.

O We can see the striking differences in network positions of the financial and industrial companies

O Overall, this shows significant variation in network positions of financial and industrial companies, which fits with the general theory of financial centrality
Methods
Methods

- Used an eight-block model (CONCOR)
  - Should have minimal industry overlap
  - An 8-block model would allow for a separate block for each bank-centered grouping, plus two blocks for independent firms
  - CONCOR results created three blocks for the 20 financial institutions, and 5 blocks for the 40 industrial firms
    - The table also includes the *keiretsu* affiliation
    - The industrial blocks did not seem to be grouped based on particular industry
    - There were no zero-blocks, so all firms in the sample shared ties with others in the network
Analysis

- Patterns of Relationships Among Blocks
  - Different relationships showed different patterns of interlocking.
    - Equity relationships showed the most complete interlocking
    - Direction is important
    - Densities among blocks in the directorship matrix are lower than for equity
Analysis

- In the debt matrix, two bank blocks send nearly all of the ties to all five industrial blocks.
- The third block (the non-life-insurance company block) is less active in lending, but serves as a major shareholder (as we can see from the equity matrix).
- Debt and equity density is positively associated in the two bank blocks.
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Analysis

- Equity and Directorship relationships were combined into a single aggregated matrix.
  - Analysis showed that the vast majority of ties existed in the three quadrants involving financial institutions; direct ties among the industrial blocks themselves were weak or nonexistent.
  - Image matrices created based on Mean Density and High Density of ties.
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Analysis

- Contact matrix
  - Financial institutions were the predominant senders and/or receivers of ties
  - Industrial firms usually connect through financial institutions, while financial institutions connect to one another.

- Domination matrix (unreciprocated ties)
  - In all cases, the dominant block is a financial block
  - In all but one case, the dominated block is an industrial block.

- Coalition matrix (reciprocal ties)
  - Block coalitions can be seen between financial and industrial blocks, and among the three financial blocks, but not among the industrial blocks themselves.
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### COALITION

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Results

Overall, these results address several of the earlier hypotheses:

- Direct ties based on *keiretsu* membership or common industry: Not supported
- Directorship interlocks: Infrequent
- Ownership interlocks: Primarily between financial and industrial firms, and to a lesser extent among financial firms. Rare among industrial firms.
- Significance of financial firms in the network and the prevalence of financial-industrial ties: Supported
- Cliques of industrial firms sharing common banking relationships: Supported
Results

- Analysis of Industrial Block Assignments
  - Block assignments do not appear to be based on industrial overlap or on interdependent firms (for example, oil products for chemical production)
Results

- Block assignments did appear to be distributed based on membership in the same *keiretsu*
  - The DKB group isn’t surprising, because it’s relatively new, the largest of the groups, and the most loosely organized.
  - The Mitsubishi group was more surprising, but this could have been a result of the interaction between their industrial firms’ ties to independent financial institutions and ties with their own financial institutions.
Results

- Some other interesting observations:
  - Nissan and Hitachi were together in Block F, despite Occupation forces’ attempts to break up this connection following World War 2
  - Block G also contained a geographic element (companies primarily headquartered in Osaka)
Using Multiple Network Analytic Tools for a Single Social Network.

By Patrick Doreian
Introduction

- Network should capture the complexity of the structural data
- Three strategies for comparing network analysis tools
  - different scholars analyzing the same data sets using their own tools and then comparing the results
  - take one dataset and analyze it in many different ways
  - build a synthetic network with its preset structural properties and apply the data and examine the fit
Data

- 14 most prominent political actors in Midwestern County
  - 7 are members of County Council
  - Members are numbered Council 1 through Council 6 and Council President
  - Former Council President – powerful leader
  - Current Council President – consensus leader
- 14 by 14 adjacency matrix with each entry representing presence or absence of political ties
Data

- Issue at hand is construction of a new jail
  - Old facility has failed all inspections and has been under a signed consent decree to change the conditions
  - No progress has been yet made

- County Executive v County Auditor
  - County Executive is pro new jail
  - County Auditor is against new jail
  - County Executive called for consolidation of his power
  - County Auditor interfered with Council Executive’s power

- Researchers Hypothesis
  - “a political actor network will be partition able into two camps”
  - the distribution of votes will correspond to the partition of strong ties within the network
Using Multiple Network Methods

- Two components to network measures
  - Tool or an algorithm
  - Conceptualization of space on which the tool rests

- Two broad structural issues
  - Meaning of a position in a structure
  - Differential densities of ties in the network
Location and Position

- Two data analytic tools to look for partitioned structure
  - MDS - multi dimensional scaling
  - Cluster analysis
- Both tools are used opening an opportunity for multiple choices
  - Choice of similarity v dissimilarity
  - Choice of an algorithm
- Conceptualization of network location can be defined in many ways
  - Proximity - measured by graph theoretic distance
  - Proximity distances are input into MDS procedure
MDS Representations

- Alliance A v Alliance B
  - Alliance A – County Executive
  - Alliance B – County Auditor
  - Stronger internal densities

- Actor K – former Council Executive is central
  - Central actor
  - Bridging role

- Betweenness scores are consistent with closeness scores and consistent with MDS output
First order star representation

- First ego is identified then actors directly linking with an ego and the ties among them
- Central location of actor L - Former Council President is evident
- Peripheral nature of K is emphasized
Conclusions

- Both conceptualizations of locations have led to the fully convergent results with only differences in internal arrangement of nodes within the alliances
  - Conclusion 1: Partition in two alliances with a central unaligned node is a strong enough signal for both conceptualizations
  - Conclusion 2: Finer details of arrangement differ due to different definitions of two conceptualizations
Implications of positions

- Position can be measured in terms of a node and a vector of its overlaps.
- Elements of individual nodes’ vectors can be permuted to maximize on their correspondence.
- Position is defined in terms of the set of overlaps then there is no need to preserve identities of actors.
- MDS representation can then be obtained from the measures of overlaps.
Results
Structural Equivalence Approach
Structural Equivalence Approach
CONCOR Approach

- Relaxes definition of structural equivalence
- CONCOR output represents both the global structure as well as most of the finer details
STRUCTURE structural equivalence approach

- Accurately split the actors in two clusters with accurate fine detail.
- MDS representations of STRUCTURE input provides accurate picture but fails to accurately place the most central actor L.

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Cliques and Connected Components

- Two approaches
  - Clique approach
    - Alliance A - 4 cliques with three members being part of the three cliques
    - Alliance B - single clique as only one link is missing between the members of the Alliance
  - 2 - Clique approach
    - Additional links form that include members from Alliance A, Alliance B and node L
- Clique, 2 - clique and MDS approaches are all consistent with each other and are also redundant
- Clique representation is cumbersome
Q - Analysis
Discussion

- Two segments are evident in the network:
  - Segment one - political alliance with County Executive
  - Segment two - political alliance with County Advisor

- All methods pointed to two clear segments

- Voting is conditioned on the alliance

- All methods detected coarse structure
  - Finer details varied with methods

- Best tool is the one that reveals clear structure

- Best approach is the one that has strict math properties
The Structure of Social Protest, 1961 – 1983

By Peter S. Bearman and Kevin D. Everett
Introduction

- Social movement organizations and others organize to take part in an organized protest that closely relates to their interests.
- Protest is “a form through which groups challenge the polity.”
- Different types of issues:
  - Tangible – allocation of social benefits, job discrimination etc.
  - Framework – social justice, inequality, capitalism
- Researchers model
  - Basic idea – Duality of a protest - named groups protest on named issues
  - First Goal: social structure of protest over time
  - Two arguments:
    - Identity replaced interest among social protest groups
    - Labor is not one of the central issues among social protest groups
  - Each period has its own repertoire
Data and Methods

- Events - national protests in Washington DC over five periods
- Substantive interests correspond to the periods selected
- 397 protests reported by Washington Post
- 300 groups protested at least once
- 100 groups protested more than once
- Only a few protested during all five time periods
- Issues occurring more than over one time period - “movements”
  - anti - nuclear movement
  - civil rights movement
  - women’s movement
  - anti - war movement
Data and Methods

- More than one group and/or more than one issue in one protest
- Successful protests are defined by their salience to the rest of the public
- Some groups make coalitions to gain the size and effectiveness
- There may be a reason for groups linking together such as homophile
Duality of Groups and Issues

- Issues were aggregated into 24 issue domains
- Issues not classified were assigned to residual issue domain and not included in analysis
- Matrix of group (i) v issue (j) where an entry of 1 in ij cell represented a presence of relationship between group and an issue
  - Inner product of GI and GI\(^t\) is GG matrix
  - Multiplication of GI\(^t\) and GI is II matrix
- GI matrices are too sparse
  - Solution: aggregate groups and issues into domains
Selectivity

- Washington Post doesn’t report all of the protests
- Selectivity drivers:
  - editorial policies
  - production
  - characteristics of protest
  - Different/new repertoire
- Organizers of the protest structure their protests to get the most media coverage
Models

- Social structure - group - group and issue - issue networks
- Group to group matrices for each period are analyzed with CONCOR
  - Cut off is defined as .95
  - “1” is reported in an image matrix when the density of cells l,j is twice the expected density
- Group centralities were computed using the Bonacich algorithm with Beta = 0.01
  - All measures were standardized for clearer comparison
Period 1: 1961 - 1963

Early Civil Rights Movement

The structure of group relations, 1961–1963

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Block 1 = Quaker
Block 2 = Labor, Congress On Racial Equality, Southern Christian Leadership Conference, National Association for the Advancement of Colored People, Student Nonviolent Coordinating Committee
Block 3 = Women, Catholic, Jewish, Fraternal and Service, Misc Civil Rights, Protestant, Community, Inter-Denominational, Black Power
Block 4 = Radical Left, Anti-Nuclear, Anti-Interventionist, Women Strike for Peace, Students, Civil Liberties
Block 5 = Neo-Nazi
Period 2: 1966 - 1968

Integrating Peace and Civil Rights

The structure of group relations, 1966–1958

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Block 1 = Southern Christian Leadership Conference, Poverty Rights, Misc. Antiwar, Quaker
Block 2 = Student, Women Strike for Peace, Radical Left
Block 3 = Labor, Student Nonviolent Coordinating Committee, Peace Coalitions, Anti-Nuclear, Misc. Civil Rights, Veterans, Inter-Denominational
Block 4 = National Association for the Advancement of Colored People, Jewish, Catholic
Block 5 = Black Power, National Organization for Women, Congress On Racial Equality, Community, Civil Liberties, Senior Citizen, Native American, Protestant
Block 6 = Fundamentalist, Neo-Nazi
Period 3: 1971 - 1973
Coupling and Decoupling

The structure of group relations, 1971–1973

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Block 1 = Quaker, Gay and Lesbian, Women, Peace Coalitions, Misc. Anti-war
Block 2 = Southern Christian Leadership Conference, Poverty Rights
Block 3 = Radical Left, Labor, Student, Veterans
Block 4 = Women Strike for Peace, Community, Black Power, Catholic
Block 5 = Fundamentalist, Fraternal and Service
Block 6 = National Organization for Women, Civil Liberties
Block 7 = Neo-Nazi, Student Nonviolent Coordinating Committee, Congress On Racial Equality, Jewish, National Association for the Advancement of Colored People, Native American, Anti-Interventionist, Misc. Civil Rights, Environment, Inter-Denominational, Senior Citizen, Handicapped, Anti-Nuclear
Period 4: 1976 - 1978

The Breakdown of Consensus

The structure of group relations, 1976–1978

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Block 1 = Native American, Black Power, Radical Left
Block 2 = Fundamentalist, Labor, Community
Block 3 = Women, National Organization for Women, Civil Liberties
Block 4 = Misc. Anti-war, Anti-Nuclear, Jewish, Catholic
Block 5 = Women Strike for Peace, Anti-Interventionist, Student, Protestant
Block 6 = Quaker, Veterans, Senior Citizen, Gay and Lesbian, Handicapped
Block 7 = Neo-Nazi
Period 5: 1981 - 1983

Labor Strikes Back

The structure of group relations, 1981–1983

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</table>

Block 1 = Radical Left, Quaker, Labor, Anti-Interventionist, Inter-Denominational
Block 2 = Gay and Lesbian, Women, Southern Christian Leadership Conference, National Organization for Women, Senior Citizen
Block 3 = Civil Liberties, Environment, Black Power, Community, Native American
Block 4 = Misc, Anti-War, Student, Veterans, Anti-Nuclear, Women Strike for Peace, Handicapped, Protestant, Catholic
Block 5 = National Association for the Advancement of Colored People, Misc. Civil Rights, Jewish, Congress On Racial Equality
Block 6 = Fundamental, Fraternal and Service
Block 7 = Neo-Nazi
The New Social Movements

- Shift of polity from politics of class to politics of style
- Importance of new social movements has been growing
- These movements are more salient to the general public and are able to shape the protest domain
Repertoire Shifts

- End of fifth period showed a great cohesion among protest groups
- Sheer size of movements became a driver for the success of the movement
- Change in repertoire from period 1 – sit ins and pickets to period 2 - rallies and marches
- Some groups stick to one repertoire – Neo Nazi – rallies
- Peripheral and marginal groups usually pick repertoires generally rejected by the dominant movements
- Each period had an associated dominant repertoire
- Central blocks define the repertoire of the protests
- There is an exception to this rule defined by fundamentalists
Discussion

- Better model – shift of attention from individual groups to structural positions
- New Social Movements are more and more important but didn’t become so until late 1970’s
- Role of labor has not declined
- The ways that groups protests are constrained to their positions
- Structure of the relationships between the positions has important implications as it shapes group’s strategies and prophesies its success or failure