A Multilevel Model of Party Identification

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Introduction

Voting behavior is relatively stable on individual level (homing pattern around "standing decision") and society-wide links between social groups and parties (e.g. class parties) that are subject to intermittent shifts and erosion. Existing models focus on micro (psychological) or macro (sociological) level and disregard interpersonal effects. We expand individual-level theory on party attachments to social contacts, connecting it to society-wide mechanisms via social networks.

Theoretical Framework

Social-psychological theories explain long-term stability in voting as result of identification with base of a party (*Party Identification, PID*):

- Dominant conception in electorate is group-based [1]: Society consists of groups → group "struggle" is substance of politics
- Parties "stand for" social groups as stewards (e.g. social democrats for "working man" → act in group interests)
- Group-party links are public knowledge (*party images*), individual group-affect induces valenced reaction to parties

PID is a social identity derived from social categorization:

- Social Categorization Theory (SCT): Identity is knowledge about group-membership → allows to distinguish "us" v. "them"
- Groups are mentally represented as *prototypes*, i.e. set of attributes descriptive of the group (attitudes, behaviors, ...)
- Prototypes are context-dependent and optimize distinction *among* groups and similarity *within* groups (*metacontrast*)
- Self-categorizing → adoption of group attitudes (convergence)

Small group identities inform political cognition and PID:

- PID subject to social influence (spouse, family, friends)
- Small face-to-face groups are primary location of political talk
- Small groups allow explicit induction of social identity
- Group identity must rely on group attribute → allows to fill abstract large-scale group category with concrete experience

Nutshell: Individuals rely on social contacts to infer what "type of people" they are and identify with the party whose electoral base best matches this self-image.

References: [1] Campbell, A. et al. (1964): The American Voter. N.Y.; [2] Salzarulo, L. (2004): Formal. self-categ. theory to sim. form. of soc. groups, in: Univ. Valladolid (ed.): Proc. 2^{nd} Int. Conf. ESSA; [3] Salzarulo, L. (2006): A contin. opin. dyn. model based on princip. of meta-contrast, in: JASSS 9:1, 13.

Model

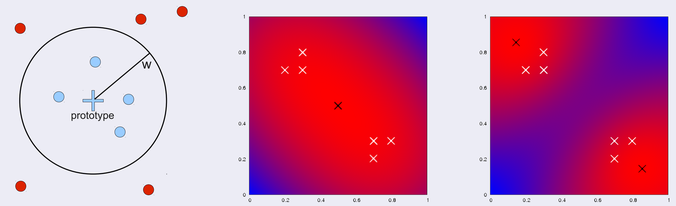
We extend the formalization of SCT from [2, 3]. Individual i is described by vector $x_i \in [0;1]^D$. The context of relevant individuals is $X = \{x_i\}_{i=1}^n$. Groups are based on social distance $d()$ and a fuzzy membership function $\mu()$ given average group size w and prototype x_p:

$$d(x_i, x_j) = \sum_{\alpha=1}^{D}(x_{i\alpha} - x_{j\alpha})^2 \text{ and } \mu(x_i, x_p) = \exp\left(\frac{-d(x_i,x_p)}{w^2}\right).$$

This allows to calculate for a given set of groups inner- ($d_{intra}(x_p, X)$) and inter-group distances ($d_{inter}(x_p, X)$) as weighted averages:

$$d_{intra} = \frac{\sum_{i=1}^{n}\mu(x_i,x_p)d(x_i,x_p)}{\sum_{i=1}^{n}\mu(x_i,x_p)} \text{ and } d_{inter} = \frac{\sum_{i=1}^{n}(1-\mu(x_i,x_p))d(x_i,x_p)}{\sum_{i=1}^{n}(1-\mu(x_i,x_p))}.$$

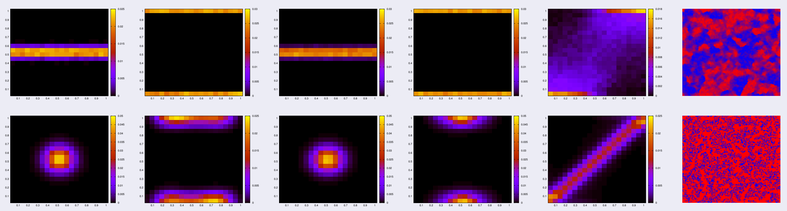
Prototypes are optimal, so individual i can infer its group prototype x_p by climbing $P(x_i, X) = a \cdot d_{inter}(x_i, X) - (1-a) \cdot d_{intra}(x_i, X)$ starting from x_i. Parameter a governs repulsion between groups.
Agents live on a grid and have (variable) opinions and (fixed) traits. On a second level, parties broadcast partisan images to attract agents. Each round agents survey their neighbors, retrieve group prototype and adopt opinions therein. After each round, agents signal party attachment with probability proportional to $\mu(x_{party}, x_p)$. Parties maximize votes by incrementally modifying x_{party}, repeating changes that improved electoral results ("Hunter").
Agent i regards neighbor j as similar with probability proportional to $\mu(x_i, x_j)$ calculated over traits. If the share s_i of similar neighbors is below t, i switches location with random agent r if $s_r < t$.



Categorization (schematic, left), P() for a=0.05, w=0.80 (middle) and a=0.30, w=0.40 (right). Agent positions: white, max(P()) = prototypes: black. Gradient indicates value of P(): blue = min, red = max.

Results and Discussion

For opinions in $D = 1$, the model has two phases: consensus or polarization [3]. We investigate behavior for $D = 2$ for both phases (cons.: $a = 0.05, w = 0.80$, pol.: $a = 0.20, w = 0.40$) with two opinions and one opinion/one trait, respectively (all uniformly distributed).



Col. 1: a=0.05 w=0.8, t=0.0 | **Col. 2:** a=0.2 w=0.4, t=0.0 | **Col. 3:** a=0.05 w=0.8, t=0.6 | **Col. 4:** a=0.2 w=0.4, t=0.6 | **Col. 5:** a=0.2 w=0.4, t=0.6 | **Col. 6:** a=0.2 w=0.4, t=0.6

Columns 1-4 (numbered l.t.r.): Upper row: Probability to find agent with trait (hor. axis) and opinion (ver. axis). Lower row: Prob. to find party with partisan image with trait (hor. axis) and opinion (ver. axis). *Col. 5*: Prob. to find agent with trait (hor. axis) and trait-representation in prototype (ver. axis) for $t = 0$ (upper) and $t = 0.6$ (lower row). Means over 8000 sweeps. *Col. 6*: Spatial distribution of traits (upper) and opinions (lower row) after run.

- **Two opinions**: Agent opinions converge (cons.) and polarize (pol.) as in $D = 1$. Party images resemble distr. of opinions (one and four peaks, resp.) → Party energy landscape identical to agent opinions
- **One opinion, one trait, no tie-resorting** ($t = 0$): Consensus phase: Agent opinions converge, party images single-peaked. Polarized phase: Agent opinions diverge, party images peaked along trait-dimension (coalitions) → Opinion polarization cross-affects trait representation in prototype (*col. 1,2*). Small-group connects both dimensions on macro level.
- **One opinion, one trait, tie-resorting** ($t = 0.6$): Agent behavior as above, parties do not address subgroups (*col. 3,4*) → Contagion and tie-resorting jointly minimize $d(x_i, x_j)$ and reduce potential for cross-polarization (*col. 5*). Trait-homogeneous areas on grid remain internally polarized (*col. 6*).

Attitudinal (issue) conflicts might foster coalitions, but assuming (trait) mixing is too restrictive. More realistic assumptions undermine party-group ties, so the breakdown suggests an important role of correlation among opinions and traits as "glue" for a cleavage.
Future work will investigate parties representing their average voter ("Aggregator"), expand context to random encounters and allow for agents to point out traits/opinions because of descriptive power.

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