Spatial Theory in 2-space

17.251
Fall 2004
Throat-clearing

• Fundamental finding of unidimensional spatial model
  – Pure majority rule: the median prevails
  – More generally: the pivot prevails

• Fundamental finding of multidimensional spatial model
  – The center doesn’t hold
  – Preferences can’t induce equilibria
  – ‘institutions (or something else) must enter
Basic set-up: Ideal points

Gov't intervention in economy

Libertinism

Jerry Falwell

Norm Coleman

Walter Mondale

Jesse Ventura
Basic set-up: Utility curves

\[ U_{\text{Mondale}} = \alpha - \beta (x_{\text{Mondale}} - x)^2 - \gamma (y_{\text{Mondale}} - y)^2 \pm \delta (x_{\text{Mondale}} - x)(y_{\text{Mondale}} - y) \]
Basic set-up: Indifference curves

\[ U_{Mondale} = \alpha - (x_{Mondale} - x)^2 - (y_{Mondale} - y)^2 \]
Basic set-up: Indifference curves

\[ U_{\text{Mondale}} = \alpha - \beta (x_{\text{Mondale}} - x)^2 - \gamma (y_{\text{Mondale}} - y)^2, \beta > \gamma \]

Libertinism

Gov’t intervention in economy

Walter Mondale
Basic set-up: Indifference curves

\[ U_{Mondale} = \alpha - \beta(x_{Mondale} - x)^2 - \gamma(y_{Mondale} - y)^2, \beta < \gamma \]
Why it matters: Jerry Falwell vs. George Bush

Libertinism

Gov’t intervention in economy

Bush indifference curve

Fallwell indifference curve
The Simple Euclidean System: The Equation

\[ U_i = \alpha - (x_i - x)^2 - (y_i - y)^2 \]
The Simple Euclidean System: The Picture

Ideal points
Status quo
Indifference curves
The Simple Euclidean System: Preference relations

\[ U_B(\varphi) = U_B(P_1) = U_B(P_2) \]

\[ U_B(P_3) < U_B(\varphi) \]
The Simple Euclidean System

A’s “preferred-to set”

B’s “preferred to set”

Guns

Butter

A

B

C

n
The Win Set, $W(n)$
The Contract Curve

B

A

Guns

Butter

n

C
The Pareto Set

A

B

C

n

Butter

Guns
You are always off a contract curve
McKelvey Chaos Theorem

- With multiple attributes and multiple decisionmakers
  - There is no equilibrium of tastes
  - Anything can happen
  - I.e., the median voter result doesn’t hold
- This is really important
What Might Induce Stability?

• Tastes
• Undertainty
• Impatience
• Rules
Tastes may induce stability

- Ideology
- "Median in all directions"
Tastes may induce stability

(Make s.q. the “median’s” ideal point, then draw the indifference curves)
Abortion Availability

Appeasing Iraq

(Rotate this graph)
The result is knife-edged
Uncertainty may induce stability

Policy w/ certainty
Policy w/ uncertainty

Appeasing Iraq

Abortion Availability
Impatience may induce stability

- Rubenstein bargaining

\[ U_{i,t} = [\alpha - \beta (x_i - x)^2 - \gamma (y_i - y)^2 ] (1 - \delta)^t \]
Rules may induce stability

• Floor rules, e.g.
  – vote on status quo last
    • Not stability so much as guarding against “anything can happen”
  – Germaneness rules

• Committees
“C” is Speaker

Guns

Butter

Status quo last
Germaneness

A

B

C

Butter

Guns
Germaneness

A

B

C

Butter

Guns
Committees (and subcommittees) reduce policy dimensionality.
Stability-inducing powers of leaders and committees

- Committees reduce dimensionality
- Committees and leaders have agenda-setting powers
Examples of Multidimensionality in Action

• Informal decisionmaking
• Riker’s “heresthetics”
  – Heresthetics: the strategic introduction of “extraneous” issues
Unresolved Issues

- Salience
- Sophistication
Salience can distort the win set

Butter

Guns

A

B

C

A

B

C

Guns
Sophisticated Voting

- The strategy of preferring one alternative at time $t$ even through the immediate alternative is better, in order to prevent an even worse outcome in the future
Sophisticated Voting Example

<table>
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<th>Democrats</th>
<th>Hawkish R</th>
<th>Dovish R</th>
</tr>
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<tbody>
<tr>
<td>Treaty+</td>
<td>No treaty</td>
<td>Treaty</td>
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<tr>
<td>Treaty</td>
<td>Treaty +</td>
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</tr>
</tbody>
</table>

Note that a majority prefers ratification of an unadorned treaty to rejection.
Agenda

• Add “proviso” to treaty
• If the proviso passes, pair the treaty with the proviso against the status quo (rejection)
• If the proviso fails, pair the treaty against rejection
Outcome

• The proviso passes
• The amended treaty fails, *even though a majority would have favored the original treaty over the status quo*
• How to save ourselves? Sophistication