Rational Choice

PLS 2000

What is it?

- Rational Choice (Positive Political Theory)
  - Build Formal Models of collective decision making
  - Rely on assumption of self interested rational action
    - Assumes people have goals and will act on those goals
- Normative vs. Positive
  - Normative describes "what ought to be"
  - Positive describes "how the world is"
    - Ideal vs. Real
- Model individuals
  - Individuals rank preferences over outcomes
  - Take risk into account
  - Model of individual actions to predict collective results

Rationality

- Assume people have preferences
- Preferences must be complete
  - Make comparisons across all pairs of consequences
  - Ex. – Rank 3 sports teams
    - Tigers > Twins, Twins > White Sox, Tigers > White Sox
    - Or Tigers>Twins>White Sox is the same thing
- Preferences must be transitive
  - If I prefer the Tigers to the Twins and Twins to the White Sox, I must prefer the Tigers to the White Sox
- We can assign utility or worth to the outcomes
  - Tigers win = 3
  - Twins win = 2
  - White Sox win = 1

Warm-up Exercise

- Andrew, Bonnie, and Chuck are three friends but they like to do different things
- Three events on Saturday, Football, Journey Concert (with a Dire Straights cover band!), Chili Cook Off
  - Andrew - Football > Journey>Chili Cook Off
  - Bonnie – Journey concert>Cook Off>Football
  - Chuck – Chili Cook Off>Journey>Football
- Are these preferences complete and transitive?
- What do they do?
- How would you decide?
  - Round Robin Tournament – Each alternative is pitted against each other alternative

Warm-up Exercise

Andrew	Bonnie	Chuck
Football	Journey	Chili Cook Off
Journey	Chili Cook Off	Journey
Chili Cook Off	Football	Football

- Football vs. Journey – Journey wins 2-1
- Football vs. Chili Cook Off – Chili Cook Off wins 2-1
- Journey vs. Chili Cook Off – Journey wins 2-1
- Journey wins because it defeats the other choices

Revised Example

Andrew	Bonnie	Chuck
Football	Journey	Chili Cook Off
Journey	Chili Cook Off	Football
Chili Cook Off	Football	Journey

- Football vs. Chili Cook Off – Chili Cook Off wins 2-1
- Football vs. Journey – Football wins 2-1
- Journey vs. Chili Cook Off – Journey wins 2-1
- Who wins?

Revised Example

- Each alternative is beaten by one of the others
- Chili Cook Off>Football>Journey>Chili Cook Off
- Individual preferences are transitive, collective or group preferences are not
- We call this a cycle
- Agenda setting and voting rules matter
  - Pit two options vs. each other and then the winner vs. the third

Agenda Setting

Andrew	Bonnie	Chuck
Football	Journey	Chili Cook Off
Journey	Chili Cook Off	Football
Chili Cook Off	Football	Journey

- Agenda 1
  - Football vs. Journey – Football wins 2-1
  - Football vs. Chili Cook Off – Chili Cook Off wins 2-1
  - Go to Chili Cook Off

Agenda Setting

Andrew	Bonnie	Chuck
Football	Journey	Chili Cook Off
Journey	Chili Cook Off	Football
Chili Cook Off	Football	Journey

- Agenda 2
  - Football vs. Chili Cook Off – Cook Off wins 2-1
  - Chili Cook Off vs. Journey – Journey wins 2-1
  - Go to Journey

Agenda Setting

Andrew	Bonnie	Chuck
Football	Journey	Chili Cook Off
Journey	Chili Cook Off	Football
Chili Cook Off	Football	Journey

- Agenda 3
  - Journey vs. Chili Cook Off – Journey wins 2-1
  - Journey vs. Football – Football wins 2-1
  - Go to Football
- Agenda setting is extremely important

Expected Utility

- Expected utility is the probability of an event happening multiplied by the utility
- Assume I prefer more utility to less utility
- EU = p*u
  - EU is expected utility
  - p is probability
  - u is utility
- Ex. - Suppose that you are in a TV show and you have already earned $1,000,000 so far. Now, the host proposes a gamble: he will flip a coin if the coin comes up heads you will earn $3,000,000. But if it comes up tails you will lose the $1,000,000. **What do you decide?**

Expected Utility

- Don't flip coin
  - Probability "winning" = 1, probability of losing =0
  - EU= 1*$1,000,000+0*0 = $1,000,000
- Flip Coin
  - Probability of "winning" = .5, probability of losing =.5
  - EU = .5*$3,000,000+.5*$0 = $1,500,000
- What do you do?
- Deal or No Deal is just a series of Expected Utility calculations
  - At the beginning of the game, the expected utility is approximately $131,477.54

Types of Risk

- Question: Will we prefer the expected value of the gamble with certainty, or will we prefer the gamble itself?
- ie. consider the gamble with
  - 10% chance of winning $100
  - 90% chance of winning $0 E(U) = $10
- would you prefer the $10 for sure or would you prefer the gamble?
  - if prefer the gamble, you are **risk loving**
  - if indifferent to the options, **risk neutral**
  - if prefer the $10 for sure over the gamble, **risk averse**

Warnings about Probabilities

- People do not always follow the rules of probability:
  - Experiment with people
  - Choice was given between A and B and then between C and D:

    A: 80% chance of $4000 C: 20% chance of $4000
    B: 100% chance of $3000 D: 25% chance of $3000

•Majority choose B over A and C over D

- This turns out to be mathematically inconsistent with the expected utility

Why Vote?

- Calculus of voting
  - V = pB - C
- p = probability of vote "mattering"
- B = "utility" benefit of voting
- C = costs of voting (time/effort spent)

Why Vote?

- Calculus of voting
  - V = pB - C + D
- p = probability of vote "mattering"
- B = "utility" benefit of voting
- C = costs of voting (time/effort spent)
- D = citizen duty, goodwill feeling

Prisoner's Dilemma

- Game theory version of tragedy of the commons
- Two players are arrested for committing a crime
- Police offer to make a deal
- Each are held in different rooms
  - Can't talk to each other
- Given two choices
  - Cooperate with police – squeal on their partner
  - Defect – Keep quiet
- Outcomes
  - Both Squeal - 3 years of prison each (3,3)
  - You squeal, partner keeps quiet - 1 for you, 4 for partner (1,4)
  - You keep quiet, partner squeals 4 for you - 1 for partner (4, 1)
  - Both keep quiet – 2 years each (2,2)
- What is the best outcome for the two of you?

Prisoner's Dilemma

	Partner	
You	Squeal	Keep Quiet
Squeal	(3,3)	(1,4)
Keep Quiet	(4,1)	(2,2)

- Two players – you and partner
- Two options – squeal or keep quiet
- Numbers are years in prison
  - First number is yours, second is partners
  - i.e. you squeal and partner keeps quiet, you go to jail for 1 year, partner 4

Prisoner's Dilemma

	Partner	
You	**Squeal**	Keep Quiet
Squeal	(**3**,3)	(1,4)
Keep Quiet	(**4**,1)	(2,2)

- Do what is best for you depending on what your partner does
- If your partner is going to squeal, what should you do to spend less time in jail?
- Squeal 3<4

Prisoner's Dilemma

	Partner	
You	Squeal	**Keep Quiet**
Squeal	(3,3)	(**1**,4)
Keep Quiet	(4,1)	(**2**,2)

- Do what is best for you depending on what your partner does
- If your partner is going to keep quiet, what should you do to spend less time in jail?
- Squeal 1<2

Prisoner's Dilemma

	Partner	
You	Squeal	Keep Quiet
Squeal	(3,**3**)	(1,**4**)
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- Partner will do his best depending on what you will do
- If you squeal, what should your partner do to spend less time in jail?
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Prisoner's Dilemma

	Partner	
You	Squeal	Keep Quiet
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Keep Quiet	(4,**1**)	(2,**2**)

- Partner will do his best depending on what you will do
- If you keep quiet, what should your partner do to spend less time in jail?
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Prisoner's Dilemma

	Partner	
You	Squeal	Keep Quiet
Squeal	(3,3)	(1,4)
Keep Quiet	(4,1)	(2,2)

- What's the outcome?

Prisoner's Dilemma

	Partner	
You	**Squeal**	Keep Quiet
Squeal	**(3,3)**	(1,4)
Keep Quiet	(4,1)	(2,2)

- Actual Outcome – both squeal and go to jail for 3 years.

Prisoner's Dilemma

	Partner	
You	Squeal	**Keep Quiet**
Squeal	(3,3)	(1,4)
Keep Quiet	(4,1)	**(2,2)**

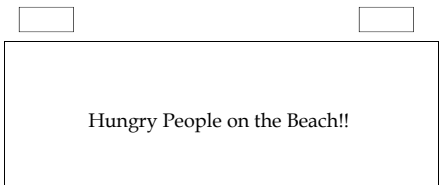
- Best Outcome for everyone – both keep quiet and go to jail for 2 years each.

Median Voter

- What is the best strategy to win an election?
  - 35% Democrats, 35% Republicans, 30% No party affiliation
  - Assume Everyone turns out to vote
- Answer – win the middle

Parties as Teams

- Example, hot dog carts on the beach



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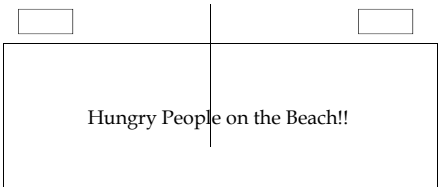

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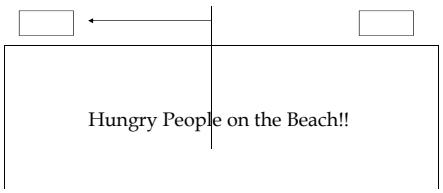

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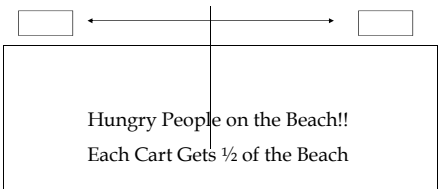

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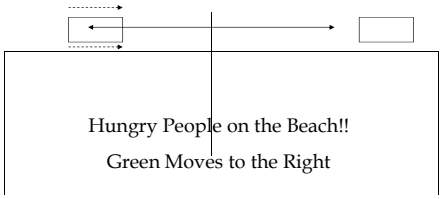

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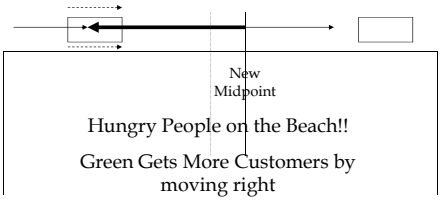

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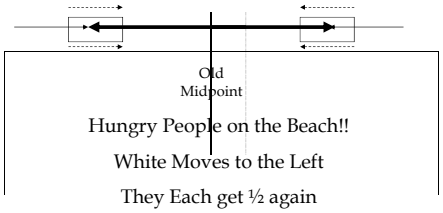

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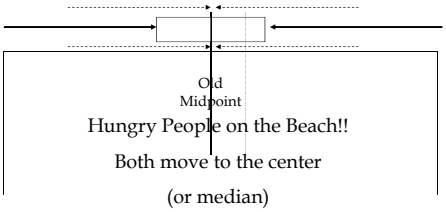

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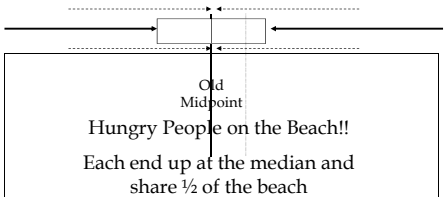


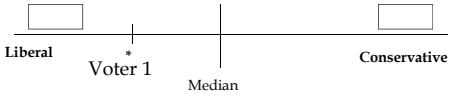
Parties as Teams

- Don't Believe it, why are gas stations across from each other?
- Applies elsewhere as well
  - TV News
  - Time and Newsweek
- What about political parties?

Parties as Teams
Anthony Downs

- Assume Two parties
  - Liberal (Democrats)
  - Conservative (Republicans)
- Voters Pick the "Team" closest to them
  - The further away the team is, the more the voter does not like that team
  - Direction does not matter
    - This is called a "single peaked preference"

Median Voter



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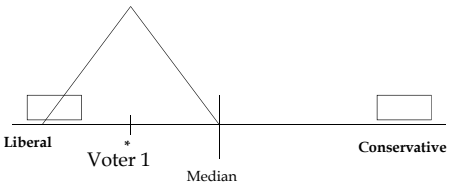
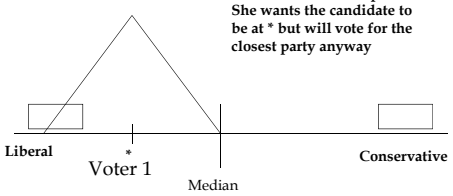


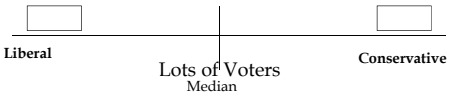
Median Voter

*** Is voter 1's "Ideal" point. She wants the candidate to be at * but will vote for the closest party anyway**



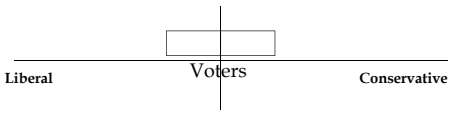
Median Voter

- Instead of One voter, there are lots of them



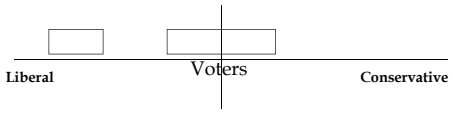
Median Voter

- Converge to the median
  - 50/50 tie
  - Coin flip



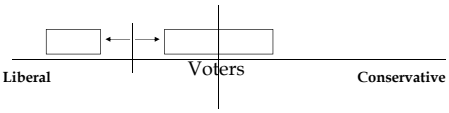
Median Voter

- What can a third party do?



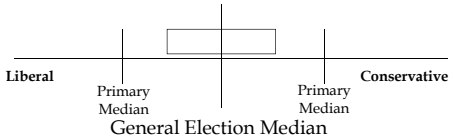
Median Voter

- What can a third party do?
- Blue and Green Split votes, Red wins
  - 2000 Election, opposite in 1992



Median Voter

- What about primary elections?
  - Voters from the candidates party choose who gets to run in the general election
  - Voters are generally more "extreme"



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