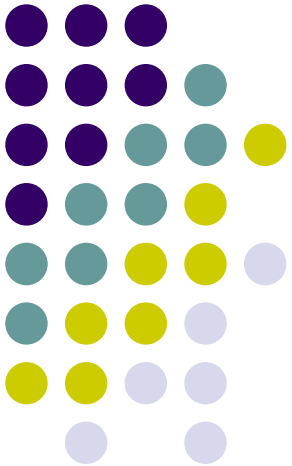
Polimetrics

Lecture 2
The Spatial-Voting Model
(and its extensions)

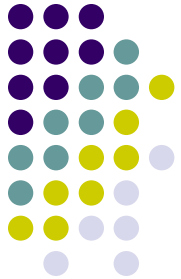


Positional dimensions of voting

The spatial model of party competition is associated with the research of Harold Hotelling (1929) and, especially, Anthony Downs (1957)

The simplest spatial model represents policy debates as options along a **one-dimensional continuum** or line and posits that both the policies that voters prefer and the policies parties advocate are represented by positions along this line

Positional dimensions of voting



The **assumption** that the space of electoral competition is **one-dimensional** is largely shared in the literature

However, once we move from the stage of *electoral competition* to the stage of *political competition within an institutional setting* (such as a Parliament or a Cabinet), this assumption is usually relaxed in favor of a two-dimensional spaces (as we will see later on…)

Positional dimensions of voting

The most well-known dimension in contemporary western democracies is the **Left-Right or liberal-conservative dimension**

"The Left-Right scale constitutes the primary dimension of conflict in most established democracies" (Marks & Steenbergen 2002)

Such dimension involves *disagreements* mainly (but not only) over economic issues such as government intervention in the economy and income redistribution

Positional dimensions of voting

The Left-Right continuum is therefore *positional* in that different voters prefer – and different parties advocate – different positions along this continuum

Positional dimensions of voting

Let's also assume that voters have linear utility loss function (do you remember??? - assuming otherwise, does not substantially change anything of what reported below), that is:

$$U_i = -|x_i - A|$$

where U_i is the utility function of voter *i*, x_i is the ideological position of such voter along the Left-Right dimension, and A is the position of party *A* along that same dimension

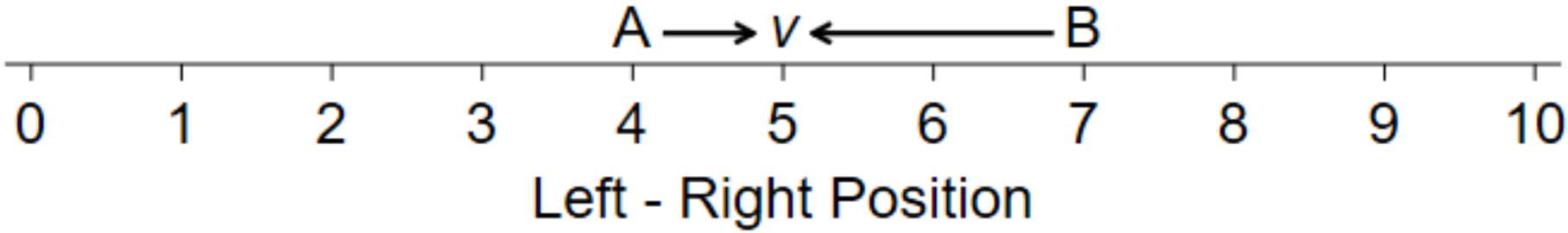
Of course, voter *i* always prefers a higher utility to a lower one!

Positional dimensions of voting

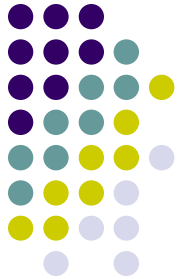
Figure below illustrates a one-dimensional model, with a voter *v* is located closer to party **A** than to party **B**

The utility to vote for party **A** would be equal to what? And to vote for party **B**?

In this example, we expect that, all else equal, this voter would prefer party **A** to party **B**



Positional dimensions of voting



Although Left-Right economic policy dominated positional debates in most Western democracies at least through the 1970s, **cross-cutting cleavages** have emerged pertaining to debates that are *not directly aligned* with Left-Right economic issues

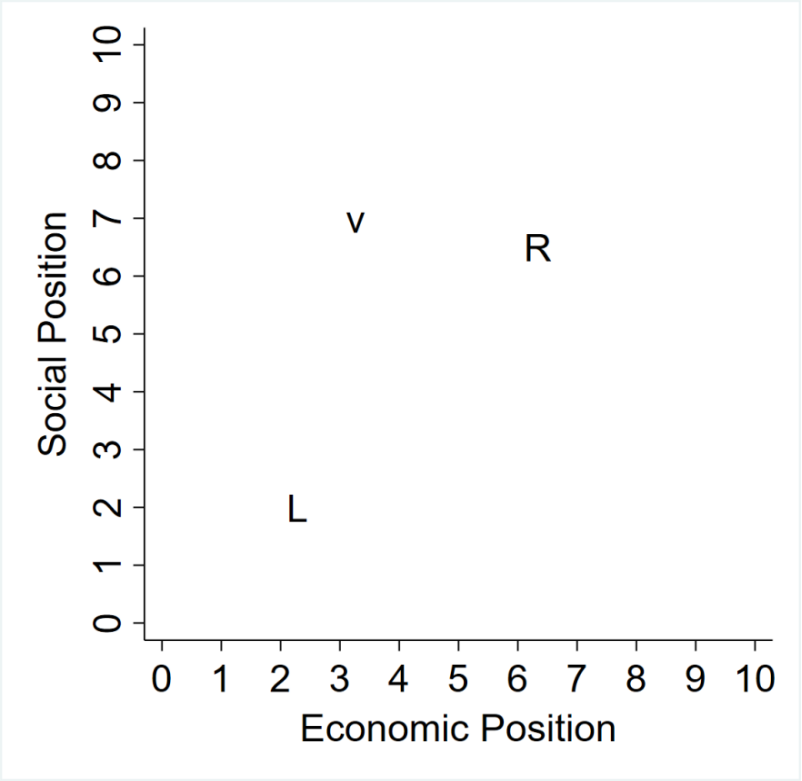
Think about social and moral issues including abortion, gay rights, and gender equality

Another emerging cleavage pertains to issues involving race, religion, and immigration

Positional dimensions of voting

Accordingly, the one-dimensional scale (from liberal to conservative or Left to Right) discussed earlier can be extended to a **two-dimensional positional model**

Voter *v* is closer (using an Euclidean distance) overall to party **R** than to party **L**, even though this voter is closer to **L** on the single economic dimension



Positional dimensions of voting

Downs assumes, under a one-dimensional framework, that:

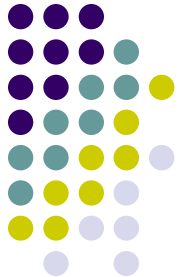
1. Voters **evaluate the parties** based on the *proximity* of their preferred positions to the parties' positions, i.e., that voters prefer more spatially-proximate parties
2. Political parties strategically announce positions that **maximize their electoral prospects**, i.e., parties are *vote/office-seeking* and propose policies purely as a means of winning votes/elected office

Positional dimensions of voting

Note however that assumption 2 forces parties to care indirectly about policy! Why that?

- Cause voters **do care** about policy after all!

Positional dimensions of voting



The two-party case

The Median Voter Theorem states that office-seeking parties should converge to the *median voter*'s position

Positional dimensions of voting

What is a **median value/position**?

The middle number (in a sorted list of numbers)

To find the Median, place the numbers you are given in value order and find the middle number

Example with an **odd series** of numbers: find the Median of {13, 23, 11, 16, 15, 10, 26}

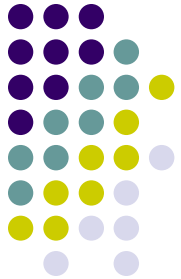
Put them in order: {10, 11, 13, 15, 16, 23, 26}

The middle number (i.e., (i.e., the number that occupies the position (n+1)/2=4) is 15, so the median is 15

Positional dimensions of voting

Note that…all the values lower than the median, **together** with the median, **form always a majority**; all the values higher than the median, **together** with the median, **form always a majority**!

What is a median value?



Example with an **even** series of numbers: find the Median of {10, 11, 13, 15, 16, 18, 23, 26}

In this case the Median is estimated using the values of the two numbers occupying position (n/2)=4 & (n/2)+1=5

You then generally average them (in this case = 15.5)

What is a median value?

In our spatial framework, the *median voter*'s position is the Left-Right position such that half the electorate is located to either side (i.e., we generally assume that the number of voters is *odd* for sake of simplicity)

Positional dimensions of voting

So why we should expect a **convergence of the two parties to the median position**?

Cause this is **optimal** for both parties!

If party A locates at this median position and party B does not - say at a position to the right of the median - party B **will lose** the election

This occurs because all voters to the left of the median together with some to the right of it will be nearer to and hence vote for party A, so that party A will win the election

However, party B can **force a tie** if it shifts in turn to also locate at the median voter position

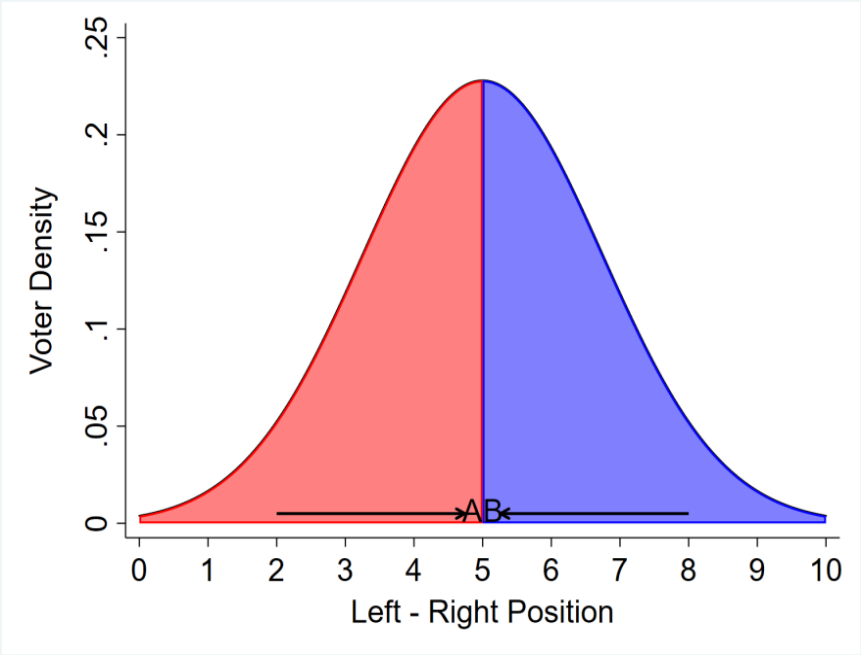
Positional dimensions of voting

Second, if both parties locate away from the median voter position then either party can win the election by **unilaterally shifting** to the voter median

Hence two-party, purely positional spatial competition provides **centripetal incentives** for parties to converge towards each other, and towards the center of the distribution of voters' ideal points

Positional dimensions of voting

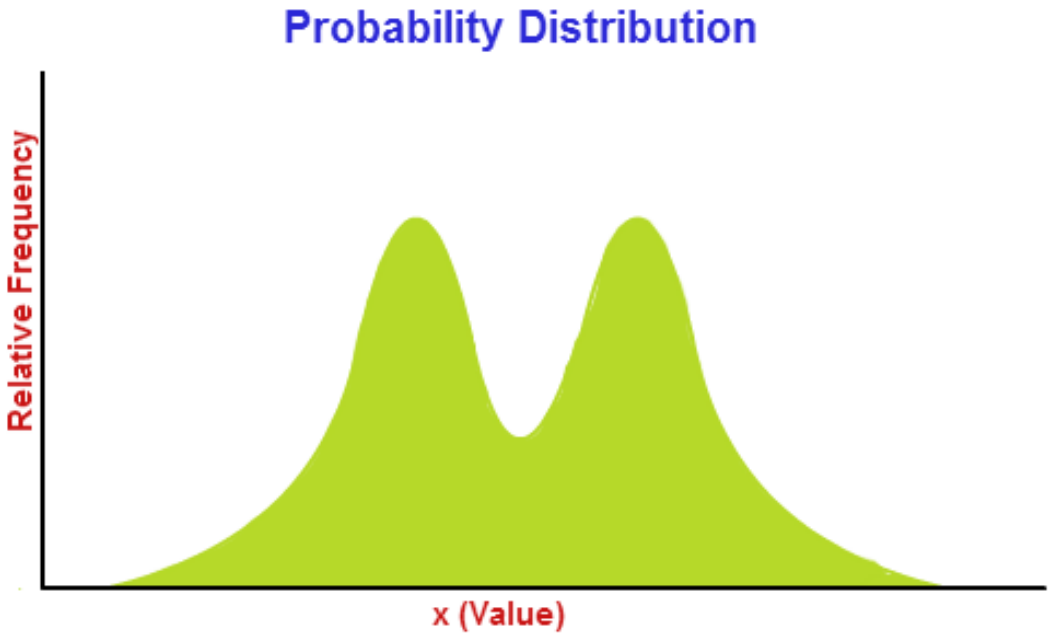
Figure below, which displays a Left-Right continuum (the horizontal axis) with a normal distribution of voters' ideal points (where the height of the line along the vertical axis represents the density of these ideal points at each position – this is usually the case in **most democracies**), illustrates this logic



Positional dimensions of voting

If we assume a bi-modal distribution, any difference?

NO! (assuming no abstention)!

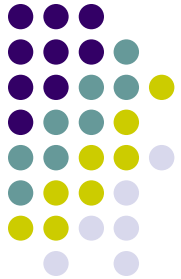


Positional dimensions of voting

In the previous case we can talk about the arising of an **equilibrium** in party positions

More specifically, we can talk about the existence of a **Nash equilibrium**, i.e., a situation where no single party has an incentive to change its strategy (i.e., its position) given the strategy adopted by the other party

Positional dimensions of voting



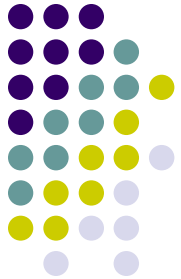
The multi-party case

The convergent equilibrium for one-dimensional, two-party positional competition **breaks down** when additional parties compete

In multi-party elections the *centripetal incentives* motivating vote-seeking parties to converge towards similar positions – and towards the center of the distribution of voters' ideal points – are in fact balanced by *centrifugal incentives* to differentiate their policy positions

Why that?

Positional dimensions of voting



The multi-party case

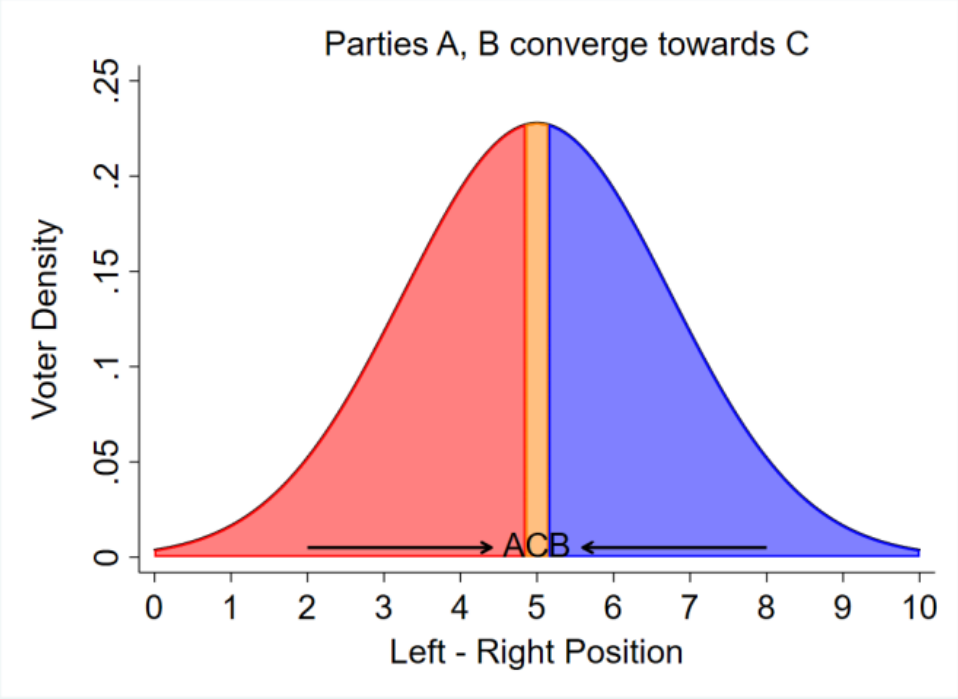
Consider a **three-party election** along the Left-Right dimension

Regardless of the distribution of voters' ideal points, the two '**peripheral**' parties – that is, the parties that announce the most left- and right-wing positions – can increase their support by converging towards the position of the third '**interior**' party

Positional dimensions of voting

The multi-party case

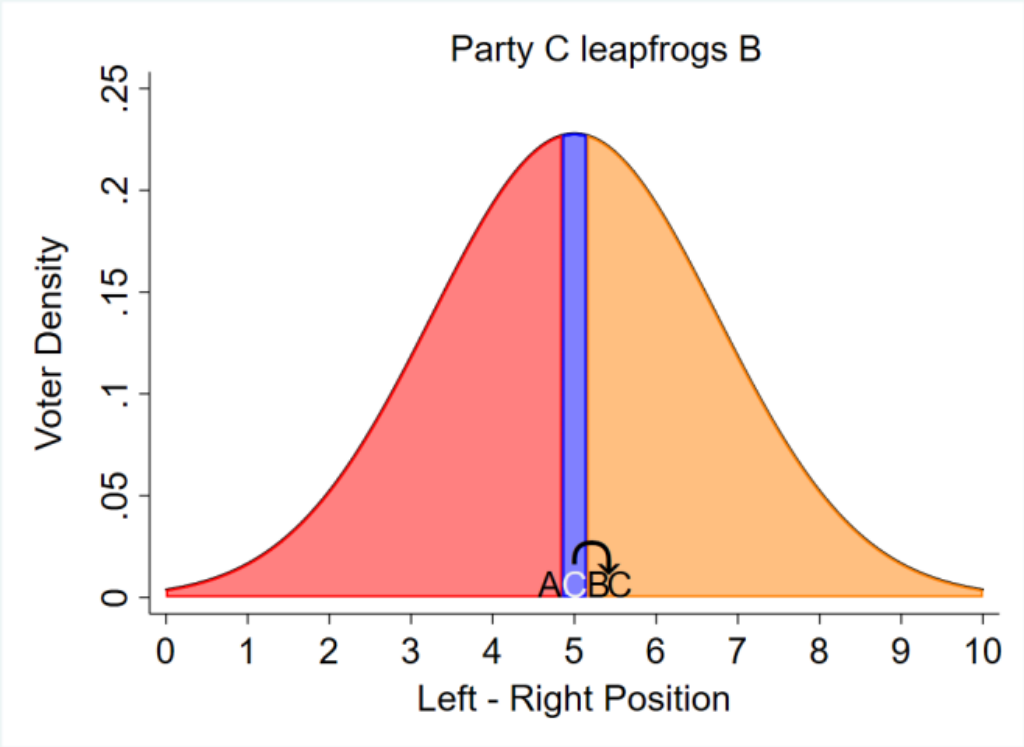
Figure below illustrates this incentive, with the peripheral parties A and B converging towards the interior party C, which causes C to be "**squeezed**" and hence to win few votes



Positional dimensions of voting

The multi-party case

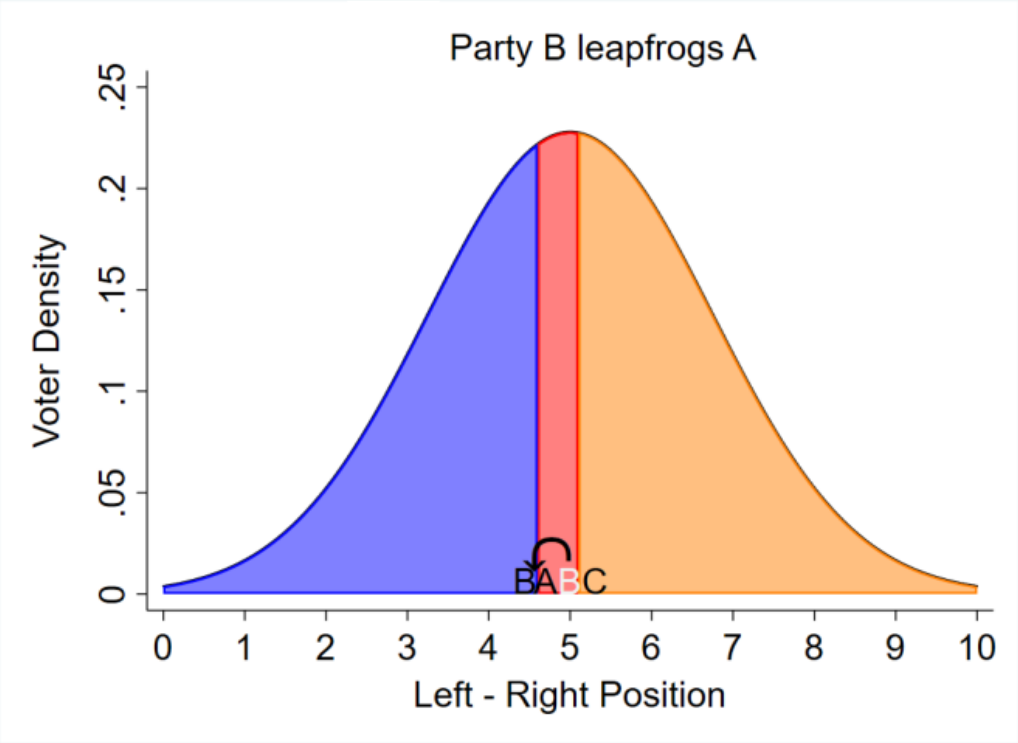
This convergence prompts therefore the interior party C to **leap-frog** the position of one of its rivals



Positional dimensions of voting

The multi-party case

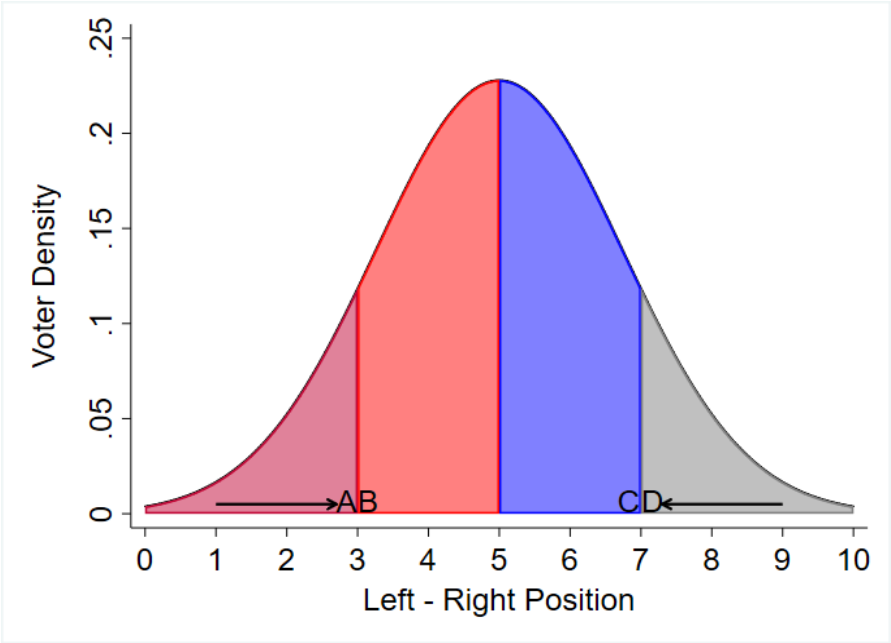
The party that is leap-frogged will in turn be squeezed, motivating it to leap-frog another party in turn, and so on without limit (and w/o any equilibrium!)



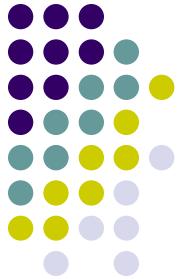
Positional dimensions of voting

The multi-party case

Moreover, note that in such framework, the **left-and right-most parties** are invariably motivated to converge towards the positions of their immediate 'neighbor' parties along the positional continuum, because this maximizes the peripheral parties' vote shares



Positional dimensions of voting



The multi-party case

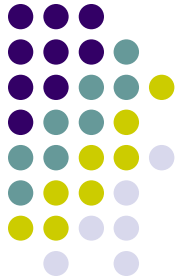
Hence for both t**wo-party and multiparty elections**, i.e., those involving at least three parties, the positional spatial model with vote-seeking parties **predicts** that the left- and right-most parties will "pair" with their nearest interior competitor

Positional dimensions of voting

In **two-party elections** this implies complete **party convergence** to the median voter position

In **multiparty elections** this implies that the most **extreme parties will converge towards the position of the most proximate interior party**, i.e., they will "pair" with an interior party

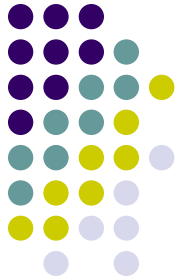
Positional dimensions of voting



The multi-party case

Whether an **equilibrium exists** for multiparty competition over one positional dimension depends on several technical details of the voter distribution and the number of competing parties

Positional dimensions of voting



The multi-party case

One condition is that, **except for a uniform voter distribution**, the **number of parties** cannot be **more than double the number of 'modes' in the voter distribution**, so that…

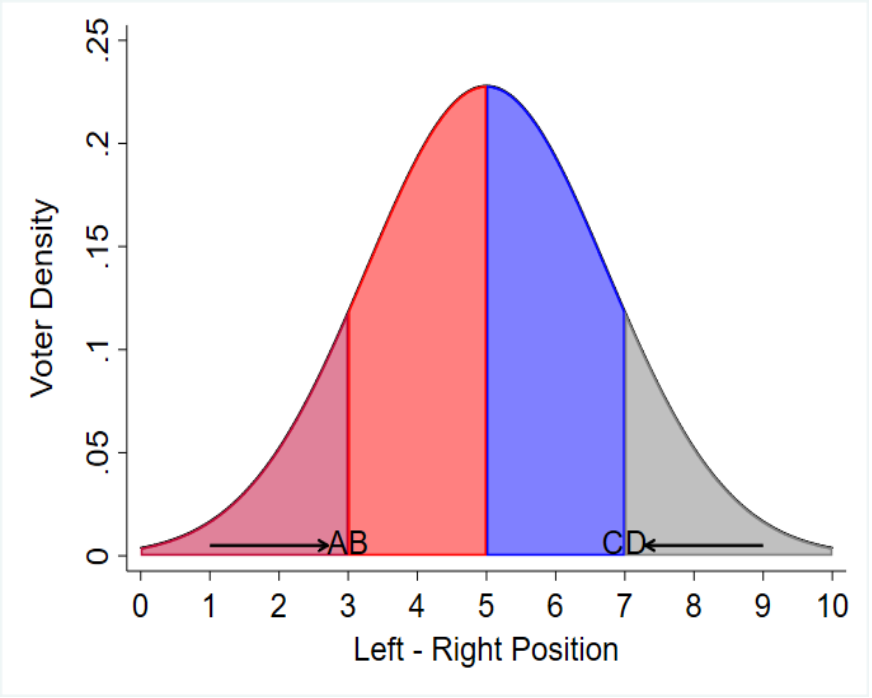
…for a **unimodal distribution** no equilibrium exists for more than two parties, a **bimodal distribution** cannot support an equilibrium for more than four parties, and so on

Positional dimensions of voting

The multi-party case

Thus, **no equilibrium** in vote-maximizing strategies is possible for the figure below

Even if **peripheral parties** A and D "pair" with the interior parties B and C, respectively, this **cannot constitute an equilibrium** since the interior parties can increase their support by unilaterally shifting their positions towards the center of the voter distribution



Positional dimensions of voting

The multi-party case

On the other hand, Figure below illustrates a bimodal distribution of voters' ideal points. In this case, parties A and B locate at the left-wing mode and parties C and D locate at the right-wing mode. And this represents an equilibrium