Proposal to Reform Electoral Redistricting by Eliminating Electoral Districts

I. Brief overview of the current state of U.S. elections

Most elections in the United States for legislators take place within single-member districts and are decided by plurality voting. Many can imagine no other way to hold elections, but in fact, our tradition is highly unusual in the world and is instrumental in producing several undesirable outcomes.[1] Gerrymandering, enabled by single-member districts, allows the dominant party of a state legislature to design district boundaries that entrench party control. Most of the Republican's 16-seat majority in the 113th Congress can be attributed to gerrymandering.[2] Alternatively, both parties can collude to shield incumbents from competition. In 2001, Democrats and Republicans in the California legislature designed state legislative boundaries so effectively that in the next election all of the 107 incumbent legislators on the ballet retained their seats, only one by less than a 20% margin.[3] Even without gerrymandering, single-member districts can lead to electoral outcomes that are intuitively unreasonable. Although Republican candidates in Massachusetts congressional elections regularly garner 30% to 40% of the vote, the state has maintained a 9-Democrat : 0-Republican slate since 1994.[4]

Apart from amplifying majority representation at the expense of the minority, single-member districts and plurality voting has had the insidious effect seen in the last half century of strengthening the most extreme factions of both major parties and squeezing out the middle.[1] While our electoral system is not the cause of the increase in political polarization -- there are many possible causes[5] -- the way we elect legislators has enabled division in the political arena to outstrip that in society at large.[6] A system that empowers voters, both majority and minority, may serve as a brake on the tendency we have seen towards political division and fruitless posturing.[1]

Some of the ills described above have been addressed through the Voting Rights Act, which has been interpreted to mandate the creation in some circumstances of districts that are majority-minority. Despite the motivation to solve an evident problem, there are clear shortcomings to this approach:

- Which groups should be favored with special attention in redistricting?
- How should they be favored, acknowledging that increasing members in one district (to render it majority-minority) reduces the group's power in another district?
- How homogeneous is the group with respect to voting behavior?
- What can be done when a group is not geographically localized?

These are difficult questions to answer and attempts to do so through redistricting commissions have led to deep divisions,[7,8] rooted in part in the ambiguities inherent in the term "community of interest".[9]

II. Multi-member districts: Strengths and weaknesses

Multi-member districts can address these issues, but the practice comes with a checkered past.[10,11] In 1967, Congress banned multi-member districts from use in congressional elections. This was partly to head off any attempt by states to dilute the voting power minorities exercised in single-member districts. Combining the districts into a single state-wide district, and granting voters a vote for each available seat, allowed the majority to impose its will on the minority for all seats. Ironically, multi-member districts are now seen as a powerful tool capable of protecting the power wielded by minorities… so long as voters are granted a ***single*** vote for multiple seats.[11,12] The combination of multi-member districts and single-votes has been put forth as a key component to equalize representation in strategies of the American Academy of Arts and Sciences[13] and FairVote.org.[14]

It is easy to see why multi-member districts should be so effective towards this end. With single-member districts and plurality voting, the winner is determined by the candidate obtaining the most votes – the majority of the electorate imposes its will. With multi-member districts and single-votes (or better, single-transferable voting, as described below), winners need to exceed a much lower threshold, determined by the number of seats combined in the district. For example, if all the congressional seats are combined in a middle-sized state like Virginia (with 11 representatives), a minority of just 9% of the electorate may be able to elect a representative of its choice. The set of winning candidates therefore more closely reflects the diverse views of the electorate. The particular views represented are decided not by those drawing district lines but by actual votes -- communities of interest in some sense may define themselves, through their aggregation behind a candidate. Furthermore, multi-member districts can increase meaningful electoral competition, providing space for centrist views.[1]

However, there are several problems that arise in the implementation of multi-member districts:

1. **Burden:** A single MMD (in most states) would impose a crushing burden on the voter. In Virginia, the voter deciding eleven seats would probably have to digest a ballot with well over 20 candidates for Representatives and far more than that in a general primary. This would almost certainly elicit despair and encourage label-based voting.
2. **Loss of regional influence:** Issues that unify a portion of the electorate behind a candidate may well be of only regional interest. That portion of the electorate would be diluted and might effectively disappear in statewide elections.
3. **Gerrymandering:** Subdividing the state into several multi-member districts would address these problems, but doing so would revive the specter of gerrymandering.[12]
4. **Uneven districts:** Splitting a state into MMDs would usually result in districts with different integral numbers of seats, which might seem peculiar to voters and, in the world we live in, might spawn conspiracy theories ('Why MY district?'). For example, Virginia might have four multi-member districts (3+3+3+2 = 11) or three (4+4+3 = 11). Either way, there's an odd district.

5. **Loss of connection of district to legislator:** Winning candidates become actual legislators, who in our current system are responsible to a local constituency, not an entire state. Districts exist not only for elections but also as a means of focusing legislators on the constituents they serve.[15] Increasing the size of districts too much could significantly decrease the connection and interaction between the legislator and locality, arguably a serious loss.[16]

It may seem that one must choose between the ills of multi-member districts and those of conventional single-member districts, but this is not the case. The purpose of this proposal is to demonstrate that the strengths of each can be combined and their disadvantages left behind.

III. Goals of the proposal

Create an electoral system that:

1. Confidence in system #1: Sustains the confidence of the voters, such that they feel their votes matter
2. Confidence in system #2: Sustains the confidence of the voters that the rules of the game are even handed
3. Confidence in system #3: Removes the conflict of interest that arises when legislators design their own districts
4. Empowerment #1: Makes it easier for minority views to gain representation in a legislature
5. Empowerment #2: Increases competition within elections so that the power of choice can operate
6. Reduction of division #1: Encourages candidates to appeal to a broad range of their constituents
7. Reduction of division #2: Does away with a process of drawing district lines that pits one minority group against another
8. Functional consequences: Preserves the ability of legislators to interact with their constituents
9. Palatability: Is not so overwhelming as to discourage voter participation

IV. Summary of proposed reforms

(Each of the components outlined below will be discussed in detail in subsequent sections)

A. Multi-member voting regions for electoral purposes only
    1. Voting regions have no static boundaries
    2. Voting regions are not defined by legislative districts
    3. Voting regions are determined computationally for each precinct (**self-organizing ballots) --** voters see on the ballot only those candidates who live within the voting region
    4. The effective size of a voting regions is determined so as to correspond to a number of legislative districts, perhaps 3 to 4 (need not be an integral number)
    5. Every candidate appears on only a subset of ballots within the state, approximately the same number for all candidates

B. Single transferable vote

1. Voters cast a vote for a single candidate within the voting region in a given round but rank all candidates on the ballot
2. Votes are tabulated statewide
3. Winners are declared whenever a candidate passes a threshold that depends on the number of remaining available seats
4. Unused votes are redistributed and the votes recounted until all seats are filled

C. Single-member legislative districts

1. Single-member districts are determined computationally (**self-organizing districts**)
2. They are determined only after the election and function only to tie elected representatives to their districts -- they are not used for elections
3. District boundaries are computed, each one to include the home precinct of each winning candidate, through a process akin to drawing a bullseye around the arrow after it landed
4. A legislative district is drawn in part to maximize the number of precincts that favored the district's winning candidate

V. Regional multi-member electoral regions through self-organizing ballots

The first four problems regarding multi-member districts listed in **Section II** may be addressed by considering the following two ideas:

1. The electoral region that governs a voter's ballot need not be the same as the voter's legislative district (though they should be related)
2. The electoral region should be small enough to avoid burdensome ballots but otherwise can be of any size.

The first idea allows us to preserve the advantages of single-member legislative districts (as discussed in the next section). The second idea allows us to create multi-member electoral regions of any desired magnitude, integral or not. For purposes of illustration, I've chosen a magnitude, ***m***, of 3.5, that is 3.5 seats per region (on average) and Virginia (with 11 congressional seats) as a test case. I think 3.5 may be big enough to allow voters most of the advantages of a state-wide single multi-member district but not so big as to make ballots unwieldy.

Together, the ideas permit what might be called **self-organizing ballots**. A candidate appears on a ballot in a given precinct if that candidate resides within a particular radius from the center of the candidate's home precinct. The radius is chosen so that (without splitting precincts) it sweeps out an area containing a population determined by ***m*** and the number of seats:

approximate population covered = $\boldsymbol{N}\,(\boldsymbol{m} / \boldsymbol{S})$

where **N** is the population of the state and ***S*** is the total number of seats in the state, i.e. the fraction of the seats considered in the electoral region. In Virginia, that population would be $\boldsymbol{N}\,(3.5 / 11)$, or about 2.8 million. Each candidate would therefore be considered by the same number of voters. **Figure 1** (next page) shows how this would play out for three example candidates – one from the sparsely populated southwest corner of the state, one from central Virginia, and one from population-dense northern Virginia. The procedure ensures that each candidate appears on the ballots of an equal number of potential voters.

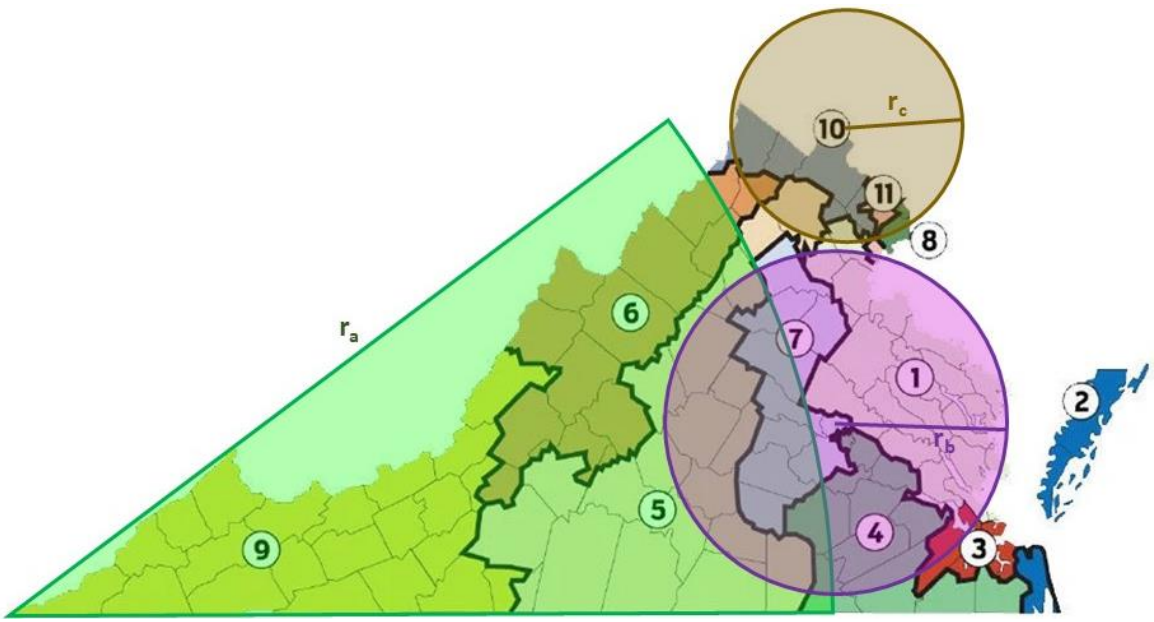

Fig. 1: The reach of the three sample candidates on self-organizing ballots. A precinct will display candidates living within r_i miles from the center of that precinct, where r_i is calculated separately for each candidate to ensure an equal number of potential voters. Three candidates are shown: (***a*: green**) living in the southwest corner of Virginia (Lee County), (***b*: purple**) living in Richmond, and (***c*: brown**) living in north Virginia (Loudoun County). The radii are approximate. The districts shown are those in force in 2021 and are shown only to help the reader relate 2021 districts to the proposed system, under which the districts would not exist. Ballots in some precincts in District 7 would show both Candidate *a* and Candidate *b*, but not Candidate *c*.

The algorithm to determine the radius for each candidate is simple for the sake of discussion, but there are many other algorithms that could be considered, for example having the radius expand at a faster rate on land than it does over water. This would cause a candidate living on the Eastern Shore (the northern peninsula of District 2) to appear on all the ballots on the peninsula before appearing on those on the other side of the Chesapeake Bay. These algorithms do not pose computational challenges, but regardless of the algorithm used, the result must be transparent and readily available to all in a user-friendly interface, so that candidates considering a run for office can see the precincts they would affect, and voters can see what candidates will appear on their ballots.

Adjacent precincts may have different overlapping lists of candidates for a position. A candidate may be running against different opponents in one precinct than in another. This, like any multi-member district scheme, would likely increase advertising costs for candidates, but the self-organizing ballots described here would also complicate candidates' efforts to run ads critical of their opponents, as their opponents might vary from precinct to precinct. I consider this an added benefit of the plan.

VI. Tabulation through single-transferable votes

While multi-member districts should be beneficial so long as voters are given one vote regardless of the number of seats in play, the goals of empowerment are furthered by employing something other than traditional plurality voting. It is a popular view amongst academicians, supported by empirical evidence (e.g. references 11 and 12), that multi-member districts combined with single transferable vote system is capable of defanging partisan gerrymandering and giving electoral

voice to any minority group that is cohesive in its voting behavior and larger than a modest threshold value. The group need not be identified as a minority party, minority ethnic group, or any other label. It need not reside in a contiguous geographical area. If a diffuse collection of former skateboarders are sufficiently numerous and hold shared political views (whether they know it or not), they can elect a candidate that represents their positions.

There are many ways to implement multi-member districts with single transferable votes, some having intuitive appeal that give weight to voter antipathy towards a candidate.[17,18] In this proposal, I've chosen for its relative simplicity a method used in Scottish local elections.[19] In brief, a voter ranks candidates by preference, 1, 2, 3, etc, as many candidates as the voter wishes. To count the ballots, if any candidate gets more than a threshold number of votes, that candidate wins one of the available seats. The ***threshold*** is determined by this formula:

Threshold = [(total votes) / (number of available seats + 1)] + 1

If there is only one available seat, as in traditional elections, the threshold becomes one more than half the votes cast, i.e. a simple majority. With eleven seats available, the threshold is approximately one-twelfth the total votes, about 8%.

In the unlikely event that eleven candidates get at least 8% the vote in the first round of voting, then all eleven win and the counting is over. Otherwise, those that do get more than the threshold are removed from the pool, declared winners, and their votes in excess of the threshold (called ***surplus votes***) are transferred proportionally to voters' next most preferred candidates. If no candidate has a vote count exceeding the threshold, then the candidate with the least number of votes is removed from contention. Each ballot that has the removed candidate as the top choice is then allocated to the next candidate on the ballot's ranked order. The procedure is repeated, with candidates being declared winners as they pass the new threshold for the remaining seats, until all the seats are filled (see Example 1 of Reference 11 for a numerically worked out scenario). Needless to say, the computational process can be automated such that it would take no longer to count votes in an election using single-transferable votes than in one that uses simple plurality voting.

VII. Determination of legislative units through self-organizing districts

Here I address the problem of preserving the ability of representatives to interact with a small, coherent constituency (Problem #5, **Section II**), using an approach similar in spirit to one proposed by Todd Makse.[9] It may help to imagine drawing a bullseye by first shooting an arrow and then painting circles around wherever it lands.

As soon as the results of an election are final, software is used to draw single-member districts with the following criteria, in descending order of weighted priorities:

- The **indivisible unit** in constructing districts is the precinct (since that's the unit of identifiable votes).
- The algorithm **builds the final nonoverlapping districts** starting from the precincts in which each winning candidate lives, then expanding outwards, precinct by precinct. If two winning candidates happen to live in the same precinct, that's OK. A coin flip determines which one gets the home precinct in the end. The rest of the algorithm is unchanged.
- All districts end up with roughly the **same number of constituents** (deviating from equality by no more than 5%).

- The algorithm **maximizes** for each district the number of **voters that voted for the winning candidate** of that district, aggregated by precinct. It pays no attention to party registration or demographic data.
- The algorithm favors **contiguity** and **compactness**.
- The algorithm respects **clearly observable boundaries and political boundaries**.
- The algorithm favors the **boundaries of previously existing districts**, recognizing that they may be familiar to constituents.
- The algorithm chooses at random amongst **equally suitable maps**.

Districts are therefore redrawn after every election, not just after censuses. There is no need to worry about communities of interest or partisan advantage, because these districts are to be used solely to focus the efforts of elected legislators on serving their constituents. Districts are not to be used for future elections and therefore do not aggregate electoral power. As a result, particular district boundaries – purely administrative -- will probably attract little controversy. The end result will be a set of districts that at least superficially look very similar to those that might have been drawn up in conventional redistricting.

VIII. Review of the proposal in light of its goals

The system takes advantage of the empowerment of minority views and increase in competition offered by large multi-member districts combined with single transferable votes (Goals #4, 5, and 6), thereby encouraging the sense in voters that their votes matter (Goal #1). It empowers minority groups through their own actions – voting and organizing – rather than explicitly favoring one group over another (Goals #2 and #7). It increases the confidence of the voter in the system by eliminating the possibility of gerrymandering (Goal #3). Self-organizing ballots cut down the candidate lists to regional candidates, thereby reducing the burden on the voter (Goal #9). Self-organizing districts produce legislative units that are no larger than current units, preserving the ability of legislators and constituents to interact productively (Goal #8).

Furthermore, the proposed reform would eliminate the decennial warfare that has promoted voter cynicism when performed by legislators and the more palatable but still disturbing conflicts made visible by public redistricting commissions. It does so by making districts ultimately unimportant in partisan politics.

IX. Practical considerations

To implement ideas such as these for federal elections, it would first be necessary to repeal the 1967 act that prohibits multi-member districts.[10] H.R. 3863 (2021), the Fair Representation Act,[20] attempts to do this, but as part of a much larger whole. As a result, it will go no further this year than have similar bills offered in the past. However, amending the 1967 act, shorn of the other clauses in H.R. 3863, might have a much better chance of success. First of all, unlike the rest of the bill, it would not mandate anything. It would simply allow states to implement multi-member districts if they wish to. While one party might calculate that multi-member districts imposed on all 50 states would work against its political interests, it might calculate further that merely making such districts possible could actually work in its favor, if it is selectively instituted in states with majorities of the other party.

So, a focused amendment of the 1967 act might well pass this Congress. If it does, I suspect that the political calculation described above might be wrong. Given that redistricting reform is an

issue that enjoys majority support from rank and file members of both parties,[21] the sentiment of the electorate might prevail against the self-interest of legislators, just as it did in Virginia to institute a weak but revolutionary redistricting commission this past year.

It should be noted that in 2020, Massachusetts voters rejected an initiative to change to ranked-choice voting for state and federal elections, and one theory for the outcome was that the reform was too confusing for an electorate that was unfamiliar with it.[22] What is being proposed here is significantly more complex than the Massachusetts initiative and would invite a similar fate. Electoral reform may be more successful if it focuses first on local elections, so that voters can gain familiarity with the concepts of multi-member districts and ranked-choice voting/single-transferable vote, before attempting to change statewide elections.

Some may wonder why one should bother with a system of the complexity described when the problem (it is postulated) can be much more easily dispatched with proportional representation achieved through voting for slates of party candidates.[23] It indeed would be simpler, but I (a product of my culture) cannot accept a system that asks us to vote for a party that happens to have individuals rather than for an individual that happens to have a party.

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