

**ON THE SIZE AND LOCATION OF THE YOLK: RESULTS USING
CYBERSENATE SOFTWARE**

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Abstract

The yolk is the set of points bounded by the smallest circle that intersects every median line in a two-dimensional spatial voting game. While the character of such a voting games clearly depends critically on the location and size of the yolk, until recently it has been difficult make useful generalizations about these matters. When the concept was first propounded in the early 1980s, there was a widespread intuition that the yolk would be centrally located and would tend to shrink in size as the number of voters increases. However, it was difficult to confirm these intuitions or even to state them in a theoretically precise fashion. Tovey (1990) showed that, if ideal points are randomly drawn from a “centered” continuous distribution, the yolk radius decreases as the number of voters increases, approaching zero as the number of voters increases without limit. This result leaves two important questions open. The first is how rapidly the yolk shrinks as the number of voters increases — for example, does a yolk with 435 voters (to pick an number of practical relevance) look more like a yolk in a small committee or in a mass electorate? The second question concerns the impact of “non-random” spatial clustering of voters (such as we would expect to see in any real-world legislature) on the size (and location) of the yolk. Using *CyberSenate* spatial voting software, we are able to provide useful answers to both of these questions.