

## ABSTRACT

Assume that voters choose between yes (Y) and no (N) on two related propositions in a referendum, where YN, for example, signifies voting Y on the first and N on the second. If a voter's preference order for the four possible combinations is, say,  $YY > NN > YN > NY$ , then this voter's preferences are nonseparable, because whether he or she will prefer Y or N on either proposition depends on whether Y or N is the outcome selected on the other. Since voters must make simultaneous choices on a referendum, nonseparability forces voters to make choices that they may come to regret after the fact.

The usual procedure for conducting multiple referenda, which we call "standard aggregation," can be interpreted as a scoring system in which each voter's ballot adds to (or subtracts from) the score of each possible combination of Ys and Ns; the combination with the greatest score is the winner. Viewing voting on multiple referenda as voting for Y-N combinations in a multicandidate, single-winner election suggests that other voting procedures, such as approval voting or the Borda count, would be superior in finding consensus choices.

In the absence of ballot data to test the effects of these alternative procedures on possible outcomes, we analyzed two variants of the plurality procedure, called "approval aggregation" and "split aggregation," that count abstentions as supportive of both sides, but in different ways. Either of these alternatives would have produced a different winning combination from that of standard aggregation on three related environmental propositions in the 1990 California general election, based on the voting behavior of the 1.7 million Los Angeles County voters. These alternative aggregation methods seem better at finding strongly supported winning combinations than standard aggregation, which produced a "weak" compromise in the 1990 election. But they severely limit the ability of voters with nonseparable preferences to express themselves, which approval voting or the Borda count would better equip them to do.

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