Reducing Manipulability
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**Criteria for voting systems**

<table>
<thead>
<tr>
<th>Veto…</th>
<th>Set of voting systems</th>
</tr>
</thead>
<tbody>
<tr>
<td>Borda…</td>
<td>Informed majority coalition criterion (InfMC)</td>
</tr>
<tr>
<td>Range voting, Approval, Coombs…</td>
<td>Ignorant majority coalition criterion (IgnMC)</td>
</tr>
<tr>
<td>Plurality, Two-round, IRV, Bucklin…</td>
<td>Majority favorite criterion (MF)</td>
</tr>
<tr>
<td>Baldwin, Dodgson, Kemeny, Maximin, Nanson, Schulze, Tideman…</td>
<td>Condorcet criterion (Cond)</td>
</tr>
</tbody>
</table>

A majority may choose the outcome when they know the other votes.
A majority may choose the outcome.
Elects a candidate when she is preferred by a majority.
Elects the Condorcet winner when there is one.

**Goal: Minimize the Manipulability Rate**

\[ \rho(f) = P(\text{voting system } f \text{ is manipulable}) \]

**Transformations**

- Initial voting system \( f \)
- Condorcification of \( f \): Elects Condorcet winner when she exists. Otherwise, same outcome as \( f \).
- Best slice of \( f^C \): Depends only on orders of preference. Meets the Condorcet criterion.

**Condorcification Thm.**

If \( f \) meets InfMC:

\[ \rho(f^C) \leq \rho(f). \]

**Slicing Theorem**

If voters are independent:

\[ \rho(f^{cs}) \leq \rho(f^C). \]

**Consequences**

To minimize manipulability while keeping InfMC, one may restrict to voting systems that:

- Depend only on orders of preference,
- And meet the Condorcet criterion.