

A Social Choice Application

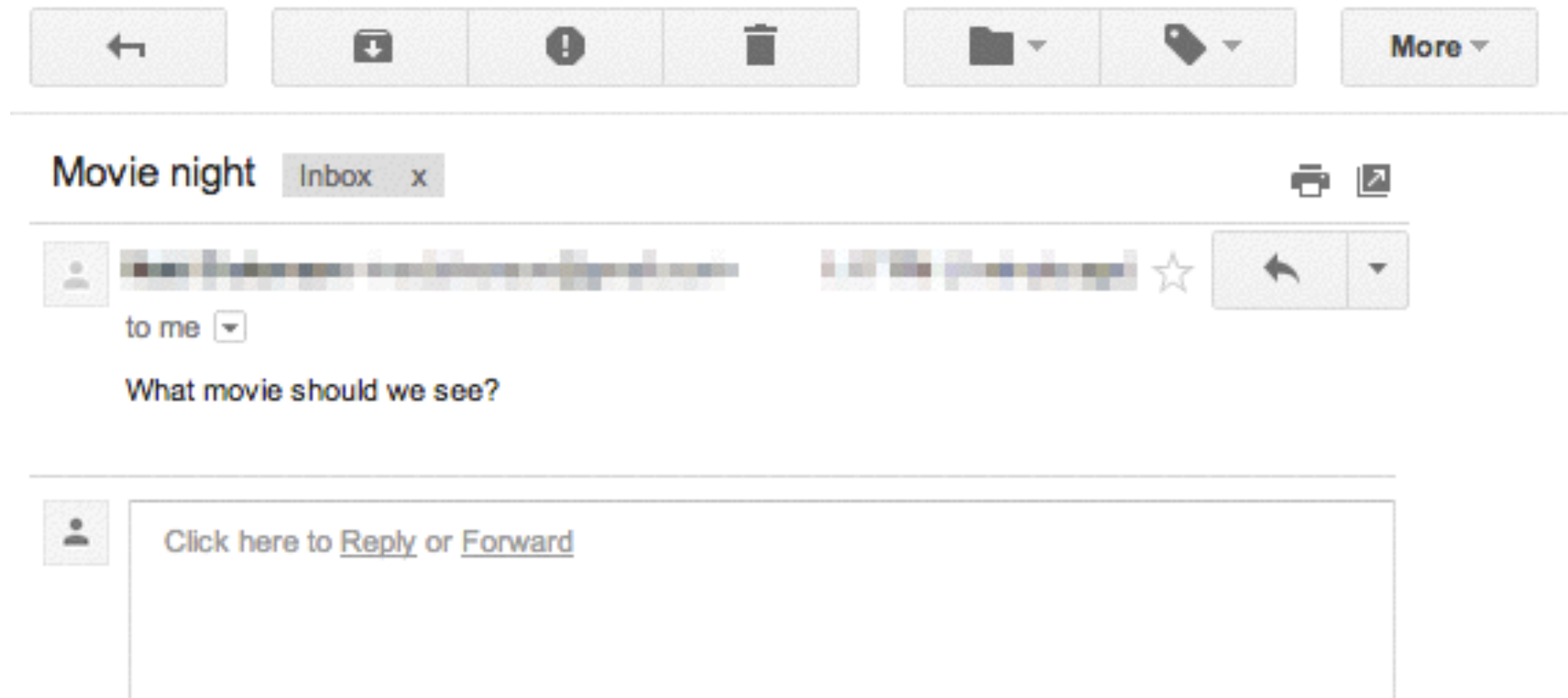
Elicitation, Voting, and Manipulation

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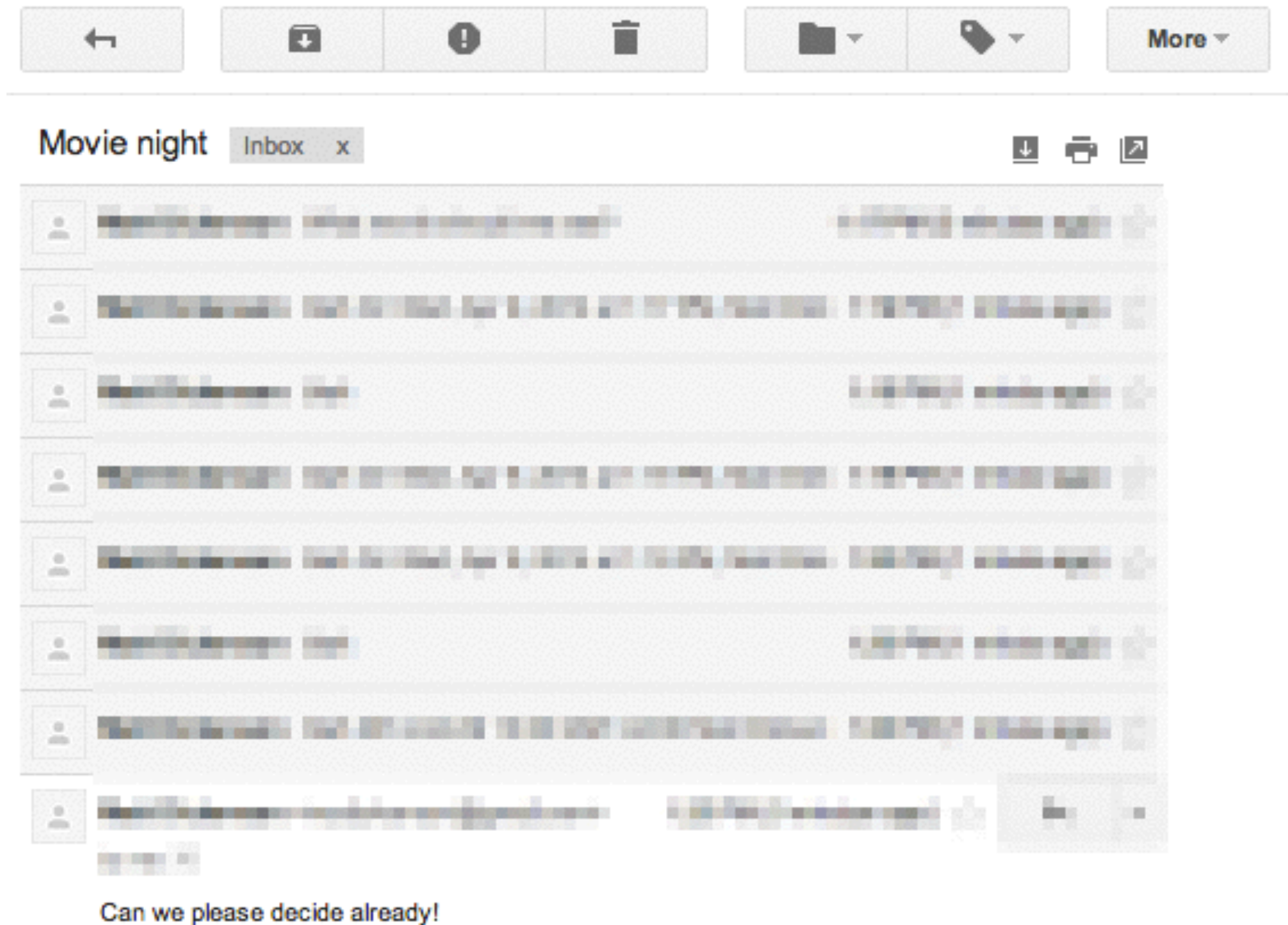
Motivation

- Group of n voters
- Coordinating on a single outcome
- From a set C of candidates
- By aggregating preferences (e.g. $c_1 > c_2 > \dots$)

Motivation



Motivation



Complexity of Elicitation

With 5 voters and 5 candidates, how many emails (after the initial message) are needed to reach a decision?

Naive

Best	3
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Worst	25
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(Even worse in practice!)

Proposed Solution

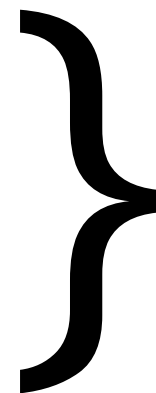
We seek a voting rule that satisfies:

- Universal domain (any ballot possible)
- Anonymity (voters' names don't matter)
- Neutrality (candidates' names don't matter)
- Unanimity (if everyone prefers A to B...)
- Reinforcement (separate groups of friends...)

Proposed Solution

We seek a voting rule that satisfies:

- Universal domain
- Anonymity
- Neutrality
- Unanimity
- Reinforcement



scoring rule

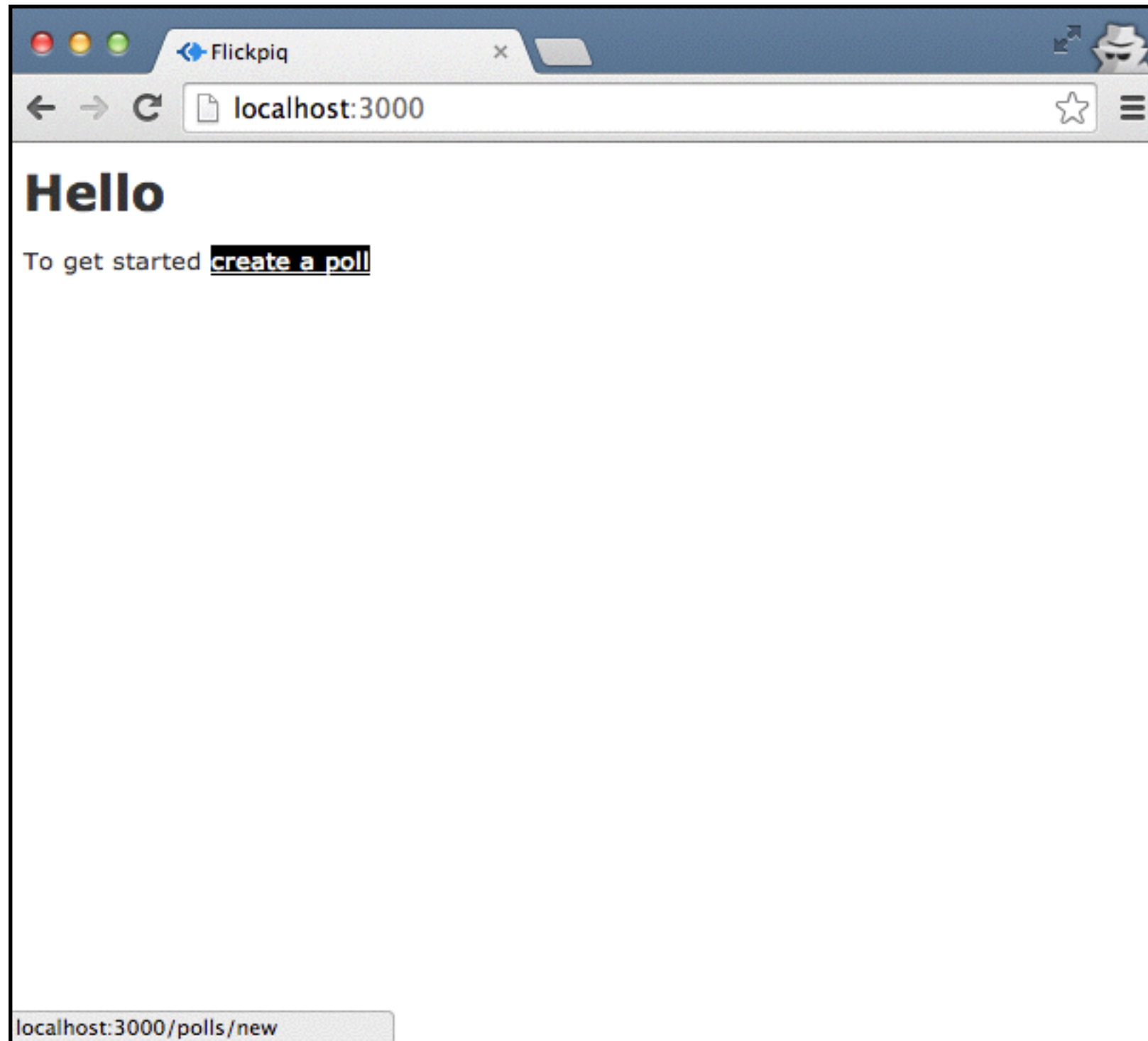
Choice: Borda count

Downside: manipulable

Application

1. Organizer creates a Poll (specified by a question) by supplying Voters (names and email addresses) and Candidates (movie-location-showtime tuples)
2. Emails are sent to all Voters
3. When everyone has responded (or at a set deadline) the Voting Rule is run
4. A final message is sent with the Outcome
5. Voters can supply follow-up information regarding how satisfied they are with the experience

Application



Application

New poll

Question
What movie to see?

Name
Matt

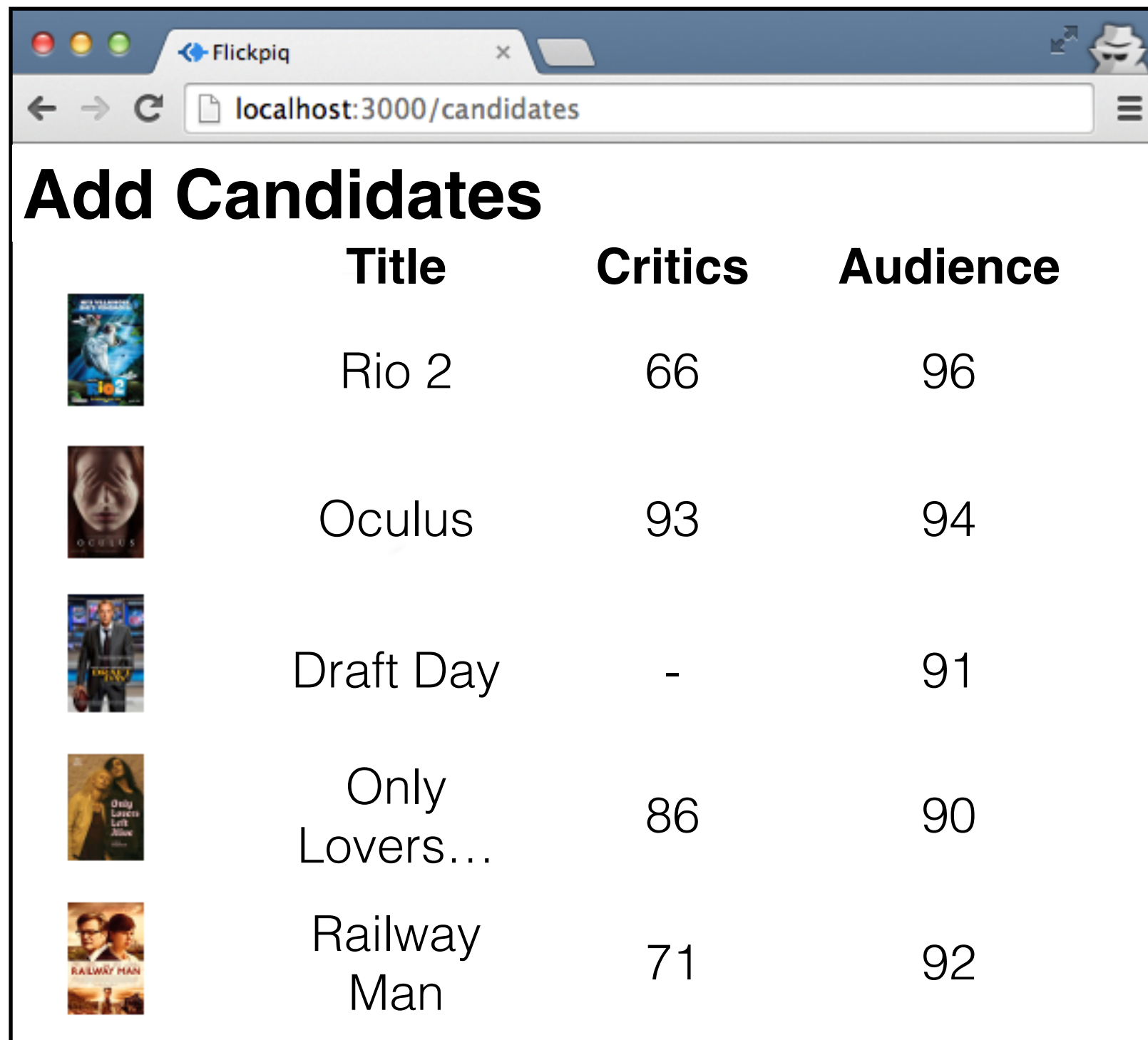
Email
matt@mail.com

Invitees






1. Name	Alice	Email	alice@mail.com
2. Name	Bob	Email	bob@mail.com
3. Name	Carol	Email	carol@mail.com
4. Name	Dave	Email	dave@mail.com
5. Name	Eve	Email	eve@mail.com

Create Poll

Application



The screenshot shows a web browser window with the title 'Flickpiq' and the address bar displaying 'localhost:3000/candidates'. The page content is titled 'Add Candidates' and features a table with five rows of movie data. Each row includes a movie poster on the left, followed by the movie title, critics' score, and audience score.






	Title	Critics	Audience
	Rio 2	66	96
	Oculus	93	94
	Draft Day	-	91
	Only Lovers...	86	90
	Railway Man	71	92

Application

Flickpiq x

localhost:3000/candidates

Place Your Vote

	Title	Your Rank
	Rio 2	4
	Oculus	2
	Draft Day	3
	Only Lovers...	5
	Railway Man	1

Complexity of Elicitation

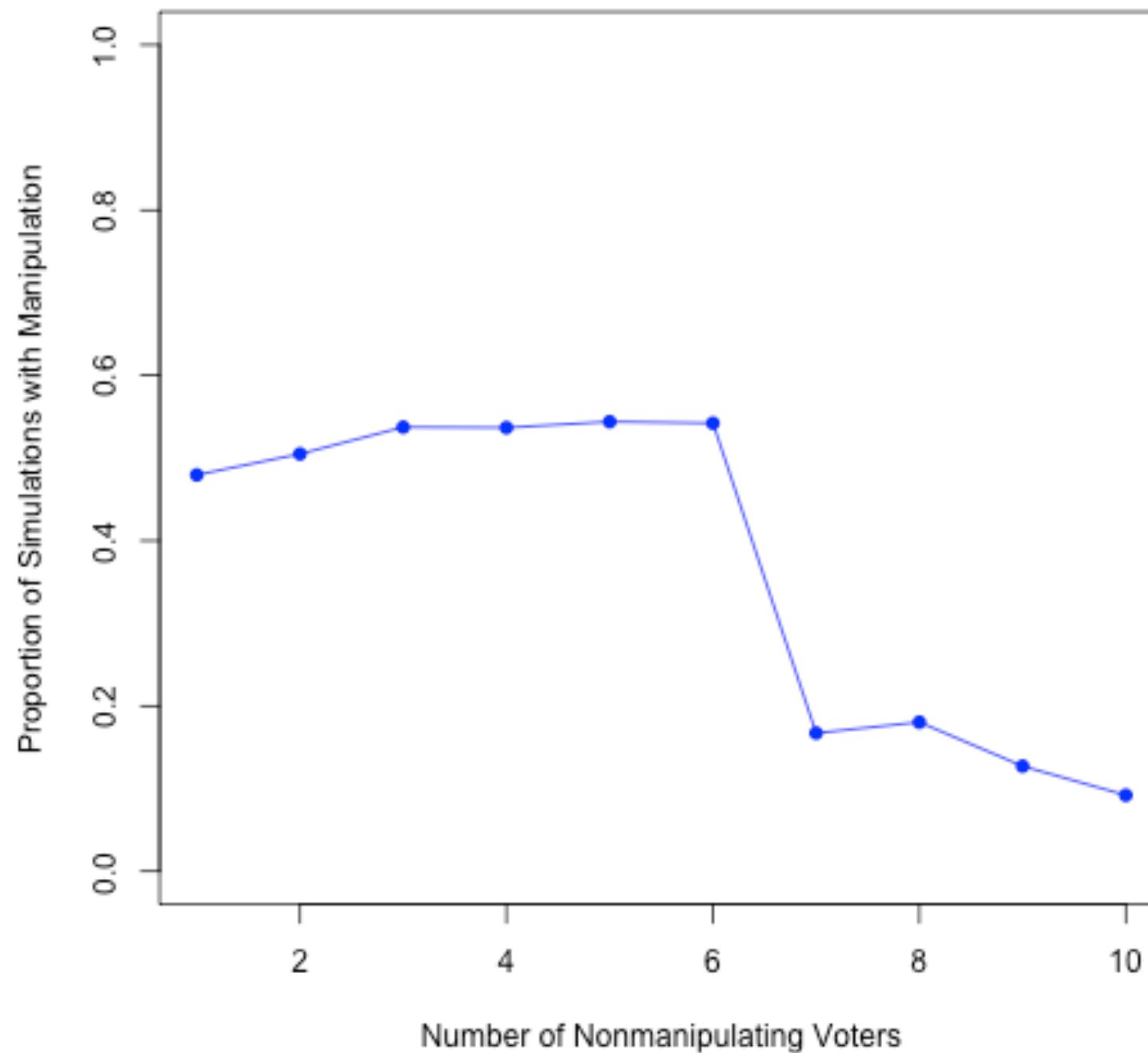
With 5 voters and 5 candidates, how many emails (after the initial message) are needed to reach a decision?

	Naive	Borda
Best	3	6
Worst	25	6

Modeling Manipulation

- One utility-maximizing manipulator (using a variant of Find-Two Winners)
- N non-manipulating voters
- All voters have types w (weights on elite vs. non-elite opinion) drawn from a (known) common prior distribution
- Manipulator has to estimate distribution of voters (imperfect info)

Modeling Manipulation



Extensions

- Model the prior stage in which the organizer selects candidates
- Account for combinatorial nature of movies
- Conduct an auction in which members split the cost of the outing
- Allow the selection of voting rule by asking about which criteria are desired

References

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2. Göksel Asan and M Remzi Sanver. Another characterization of the majority rule. *Economics Letters*, 75(3):409–413, 2002.
3. Gerhard J Woeginger. A new characterization of the majority rule. *Economics Letters*, 81(1):89–94, 2003.
4. H Peyton Young. Social choice scoring functions. *SIAM Journal on Applied Mathematics*, 28(4):824–838, 1975.
5. John J Bartholdi III, Craig A Tovey, and Michael A Trick. The computational difficulty of manipulating an election. *Social Choice and Welfare*, 6(3):227–241, 1989.
6. Vincent Conitzer, Tuomas Sandholm, and Jerome Lang. When are elections with few candidates hard to manipulate? *Journal of the ACM (JACM)*, 54(3): 14, 2007.
7. Vincent Conitzer and Tuomas Sandholm. Nonexistence of voting rules that are usually hard to manipulate. *AAAI*, 6:627-634, 2006.