

Let's Agree to Agree: Targeting Consensus through Majority Dynamics

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Effects on Consensus

What is Consensus?

Condorcet Winner (CW): beats all others in pairwise majority contest

Preserving Consensus:

For *every* profile, if there exists consensus initially, then for *every* update order, there is consensus at the end.

$$m = 3$$

CW existence preserved.
CW identity not preserved.

$$m > 3$$

CW existence not preserved.

What happens to Consensus?

$$m > 5$$

CL can become CW.

Strict Weak Orderings

CW identity is preserved.

Controlling Consensus

Positive Control:

For profiles with consensus, there is always an update order preserving it.

Negative Control:

For profiles without consensus, there is...

...an update order preserving absence of consensus

OR

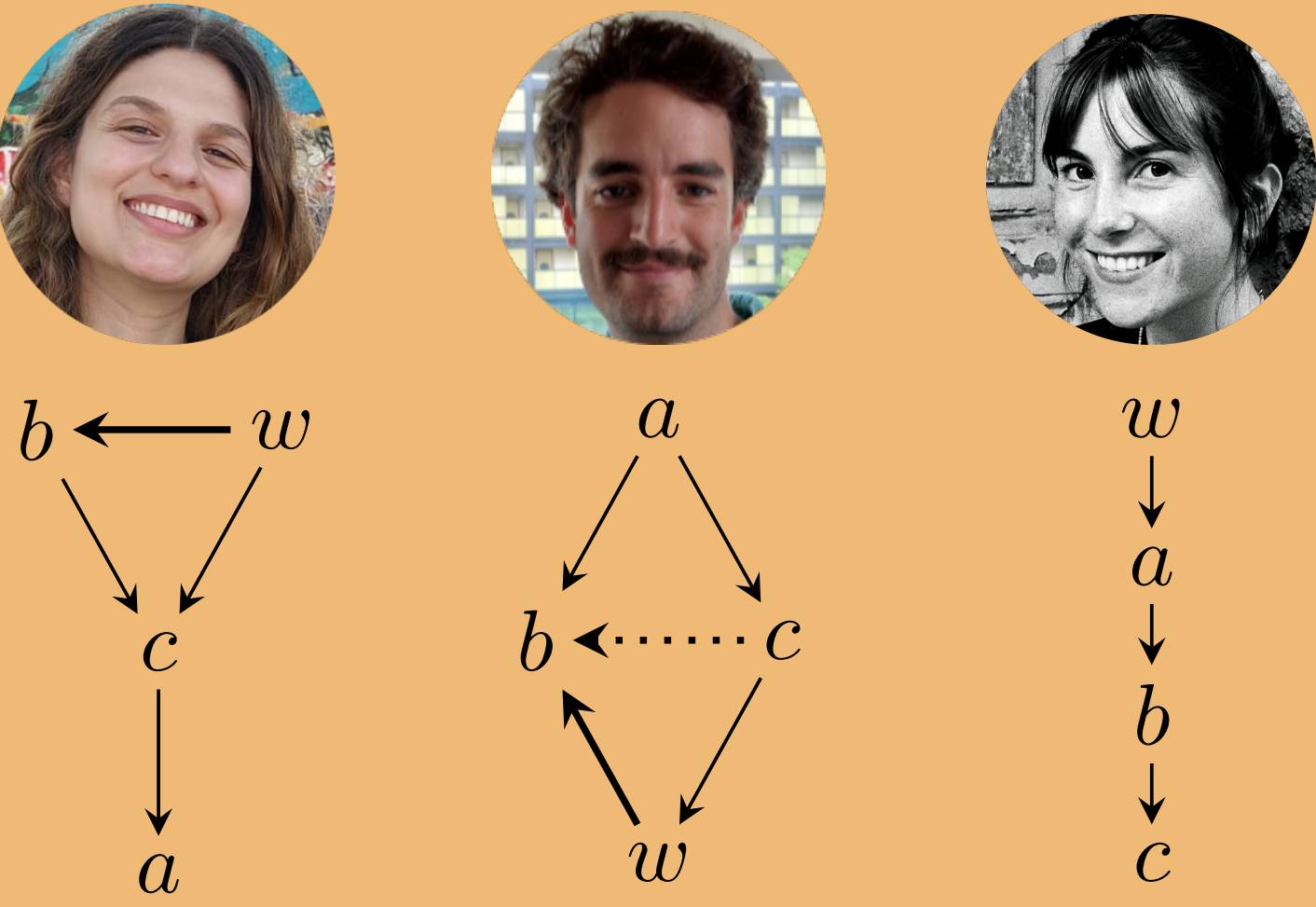
...two distinct consensus alternatives can be reached.

Results:

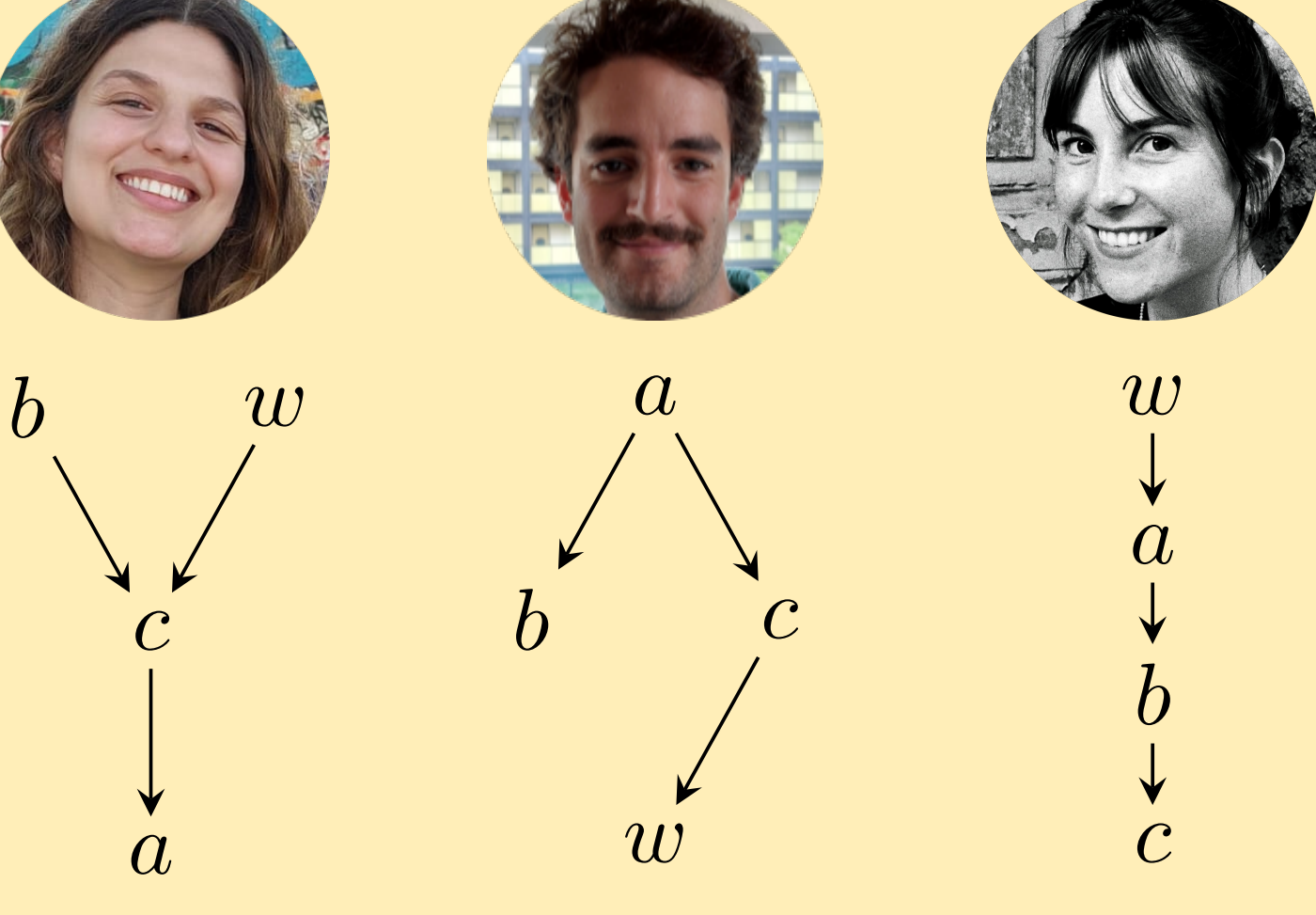
MD enables positive CW identity (and thus also existence) control.

MD enables negative CW control.

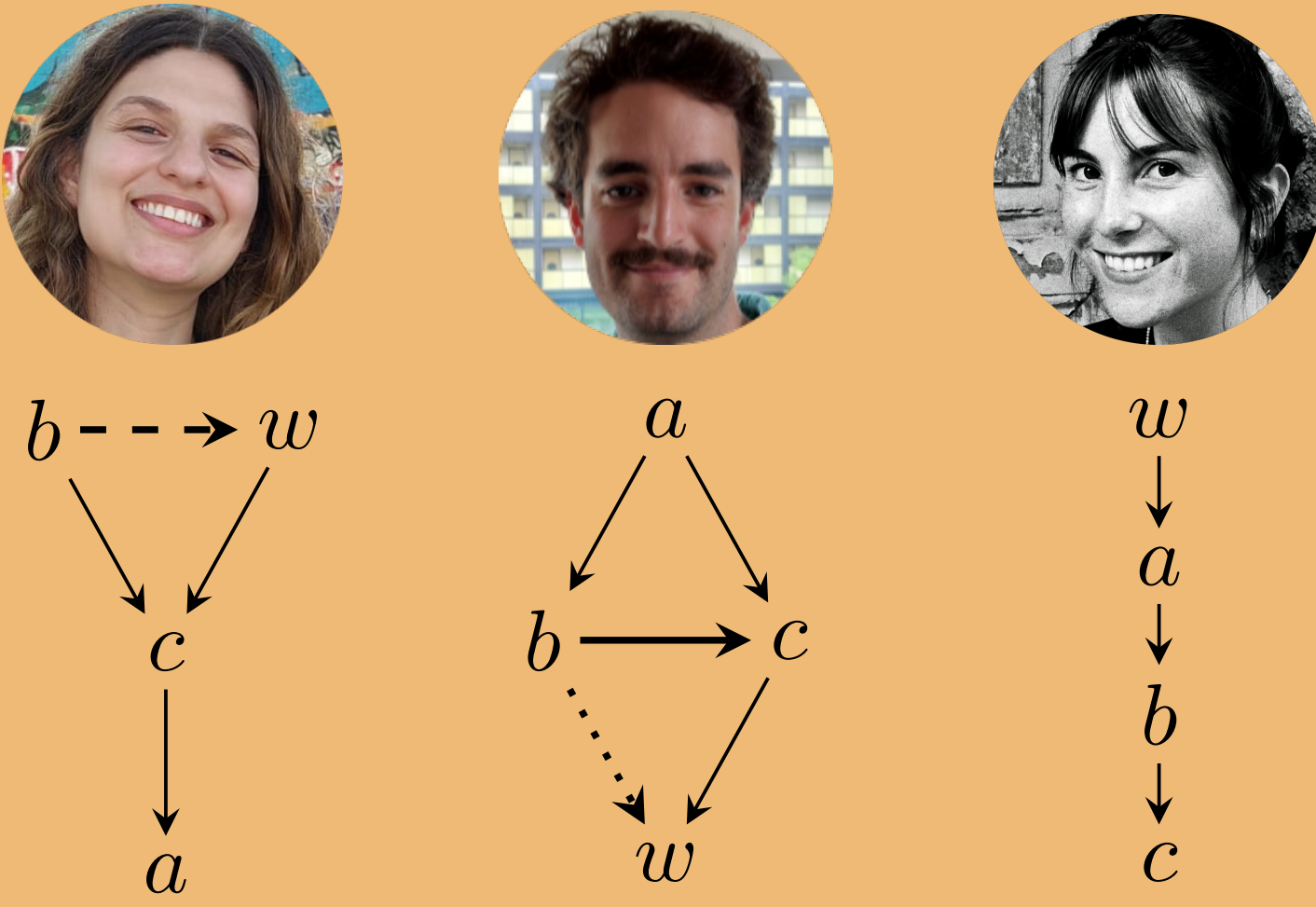
$$\sigma = (bw, bc, \dots)$$



Initial Profile

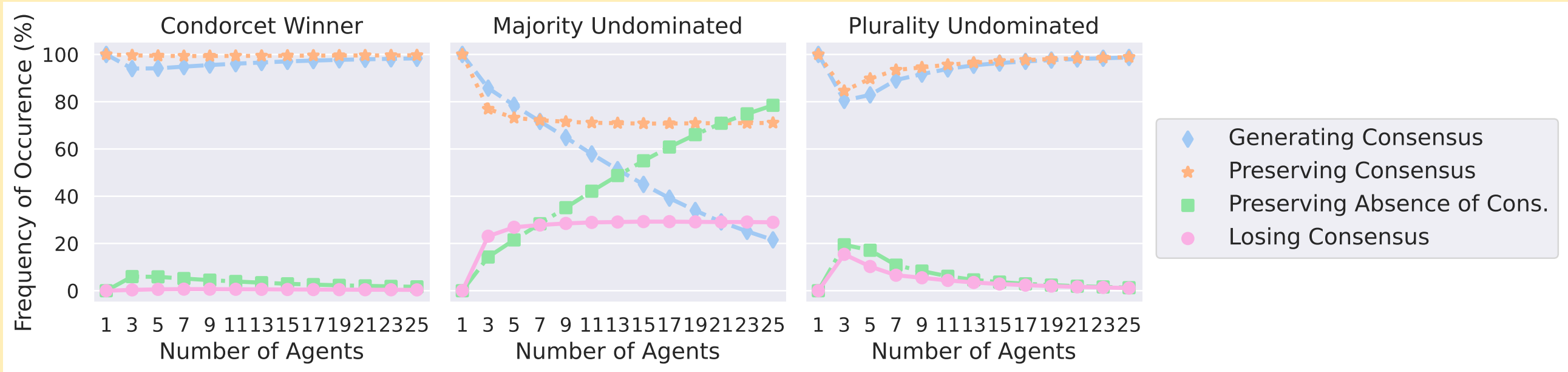


$$\sigma = (bc, bw, \dots)$$

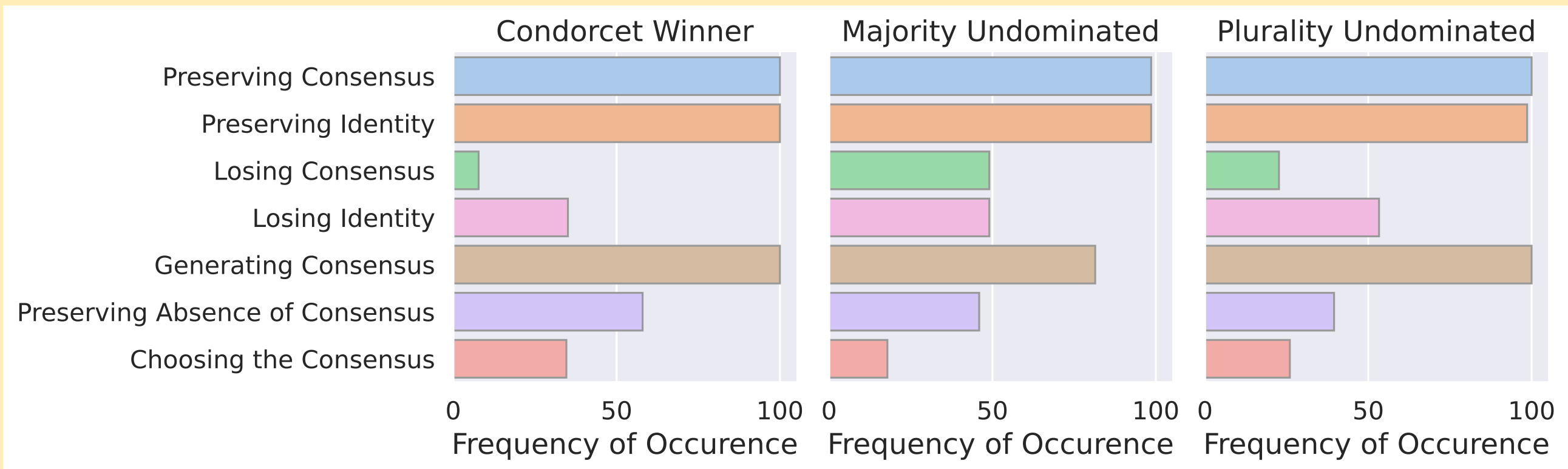


Experimental Results

Frequency of Effect on Consensus



Frequency of Types of Control



Other Notions of Consensus

	Preserving Consensus	Positive Control	Negative Control
Condorcet Winner	✗ (✓)	✓	✓
Plurality Undominated	✗	✗	✗
Plurality Dominant	✗	✗	✗
Majority Undominated	✗	✓	✗
Majority Dominant	✓	✓	✗
Unanimity Undominated	✗ (✓)	✓	✓
Unanimity Dominant	✓	✓	✗

Summary of effects on consensus.
‘✓’ means that the effect holds for the given consensus notion,
and ‘✗’ means that it is violated.

Results for strict weak orderings, when they differ from the general case,
are shown in a parenthesis.

Come see the talk tomorrow morning! (But ask questions now!)