# Modeling Group Discussion Outcomes from Perspective Composition

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# 1. Motivation

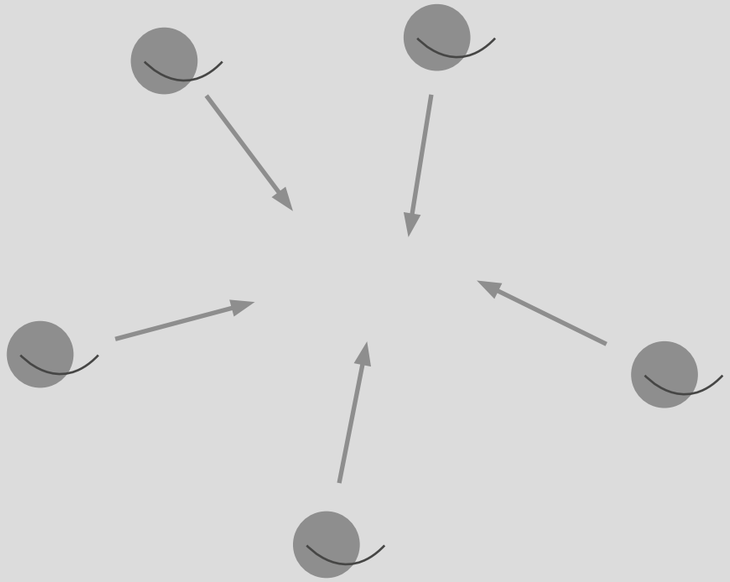
# 2. A Computational Method

# 3. Study Proposal

# Motivation

We need to better understand the ingredients of a productive discussion

# Discussion spaces are important

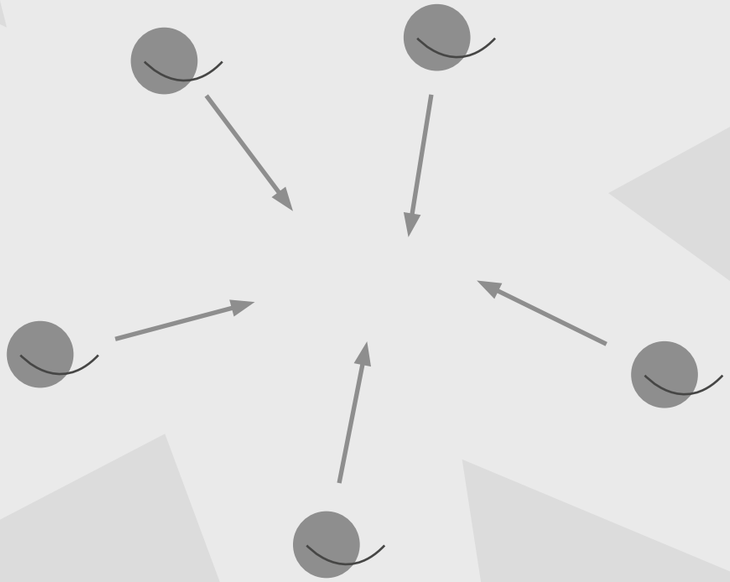


Huge diversity of perspectives

Progress happens through discussion and compromise

Discussion is foundational to a democratic system

# Online spaces foster conflict

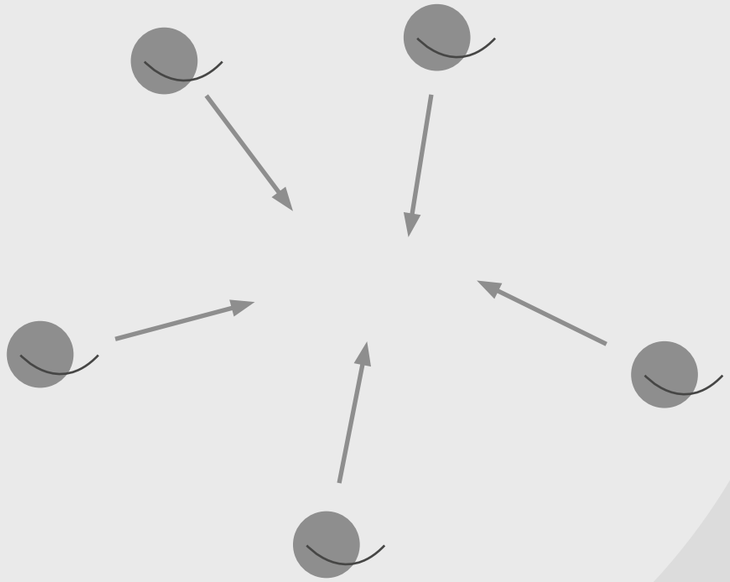


Often build on preexisting tribal tendencies

Can lead to echo chambers, lack of ideological diversity

A progressive creep towards the extremity

# Discussion spaces can be productive



Design with a better understanding of discussion

Understand in a way transferable to design

Develop well-considered digital spaces that leverage this understanding

# Towards a fuller understanding

Codify *discussion*, *productivity* in each instance

Find variables that have a significant effect on productivity

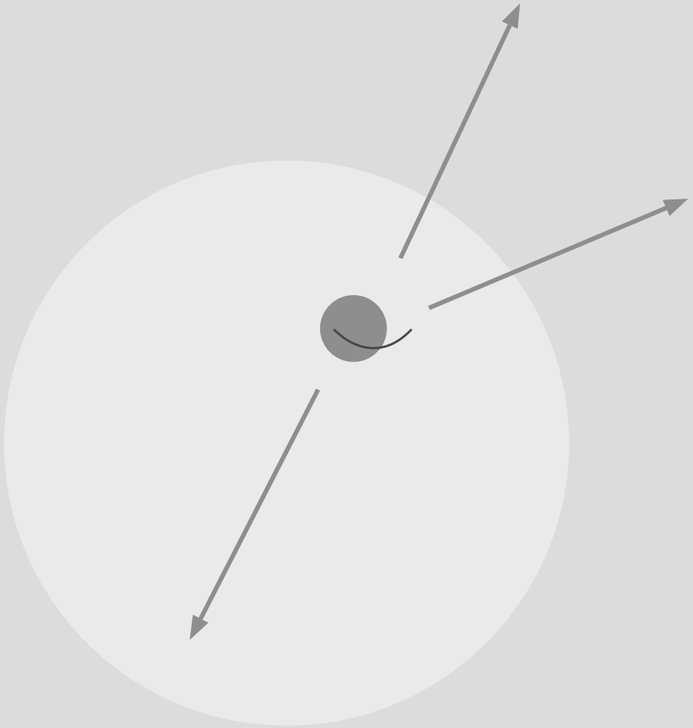
Goals, variables combine in an ethical design

# A computational method

Using perspective as a way of generating more productive discussion spaces

*A computational method*

# A perspective based approach



A perspective emerges through discussion on a topic

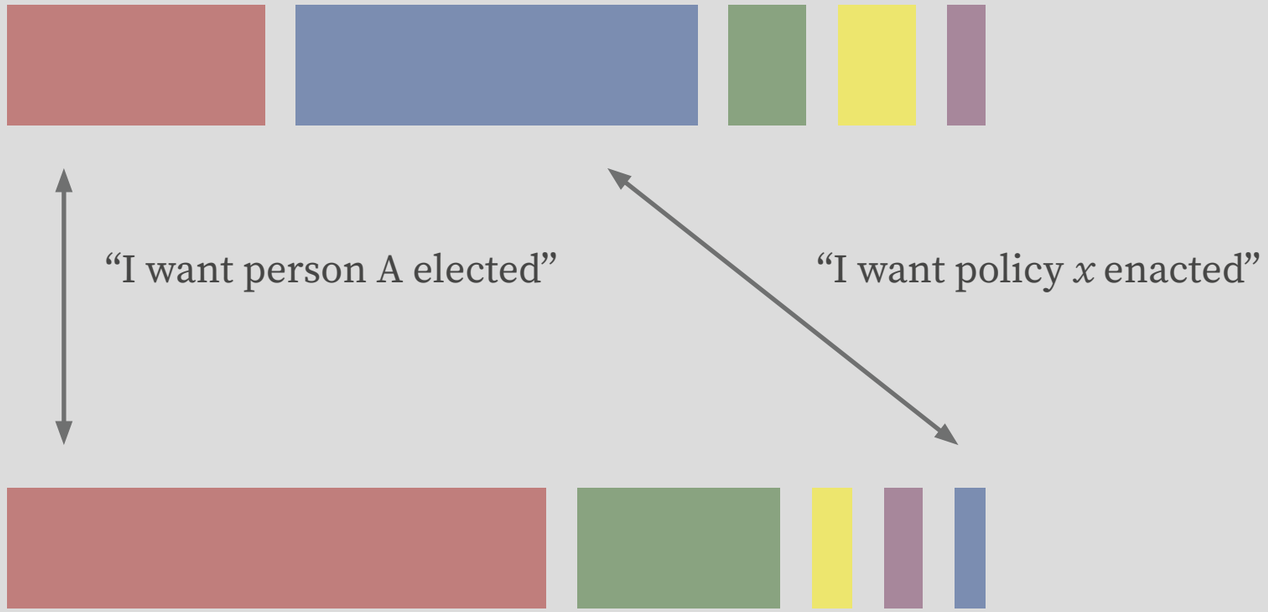
Can be inferred before, too

Some tension between content based vs. psychological approaches

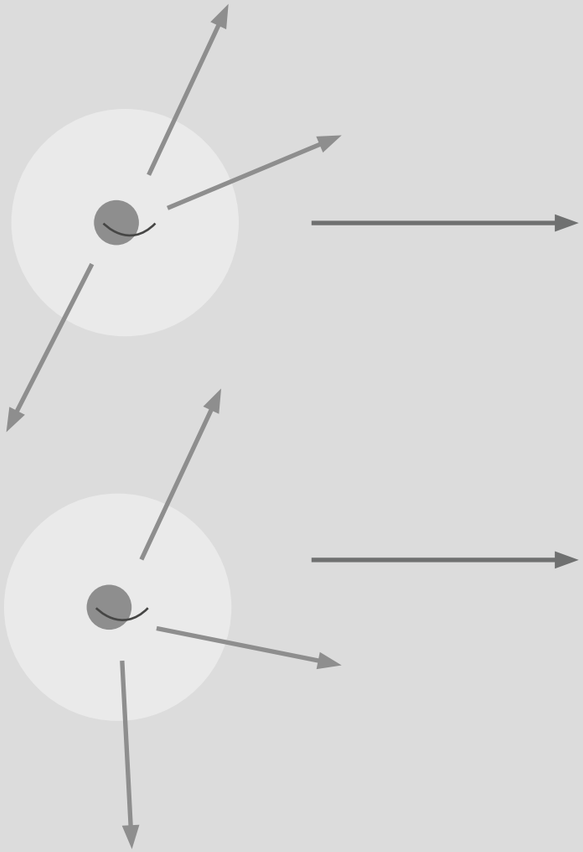
While shallower, content based can be less intrusive

Can use perspective similarity as a measure

# A perspective is a vector of features



# A perspective is a vector of features



[0.55, 0.2, 0.1, 0.1, 0.05] **A**

[0.70, 0.1, 0.05, 0.1, 0.05] **B**

*A computational method*

# Soft cosine similarity

$$\text{soft\_cosine}_1(a, b) = \frac{\sum_{i,j}^{N} s_{ij} a_i b_j}{\sqrt{\sum_{i,j}^{N} s_{ij} a_i a_j} \sqrt{\sum_{i,j}^{N} s_{ij} b_i b_j}},$$

Direct comparison of two perspective's features

*A computational method*

# Soft cosine similarity

$$\text{soft\_cosine}_1(a, b) = \frac{\sum_{i,j}^{N} s_{ij} a_i b_j}{\sqrt{\sum_{i,j}^{N} s_{ij} a_i a_j} \sqrt{\sum_{i,j}^{N} s_{ij} b_i b_j}},$$

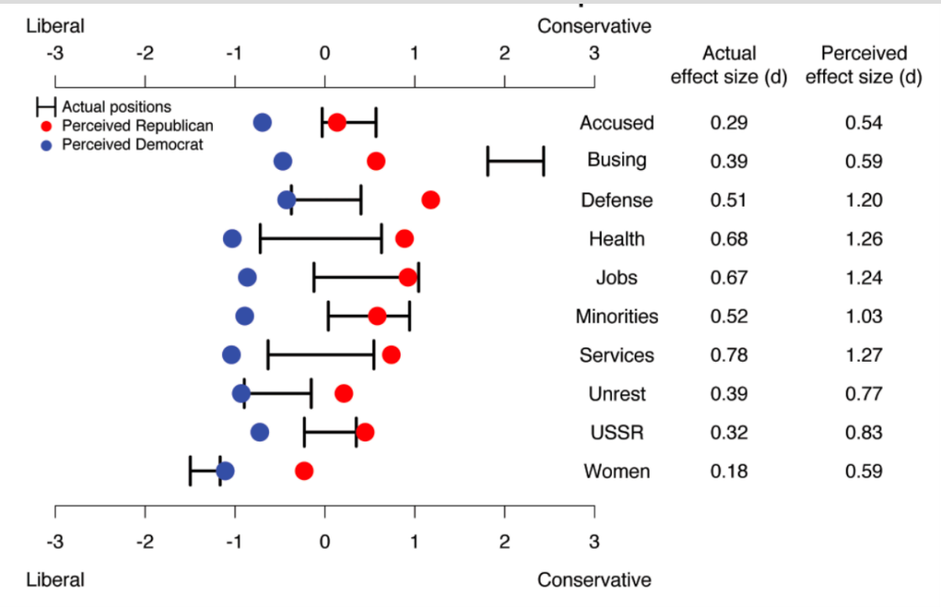
Adjusting by similarity of each feature pair

"I want policy *x* enacted"

"I want person A elected"

*A computational method*

# Features and normal distribution

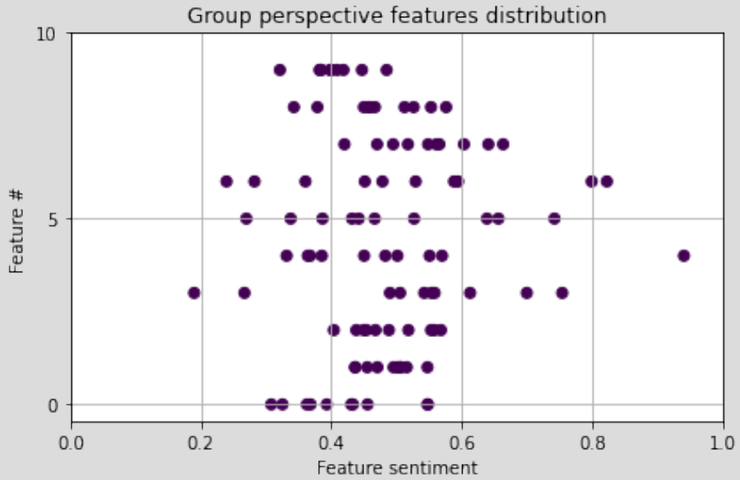


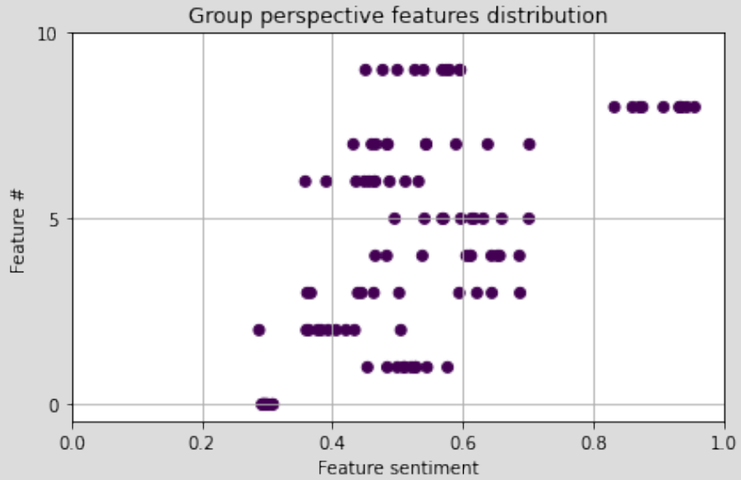

Perspective is composed of 10 features: sentiment on key issues

Each feature has an observed mean and standard deviation

For each feature, sample from a normal distribution

# Perceived vs actual features




Perceived positions

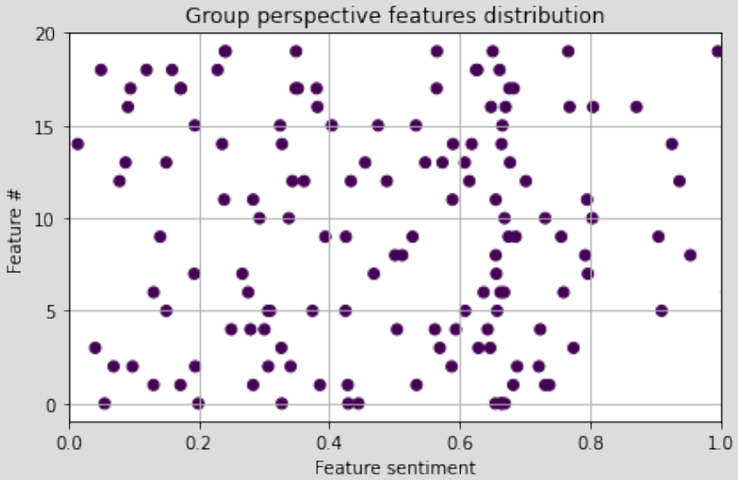
`homogeneity = 0.894801`

Actual positions

`homogeneity = 0.987357`

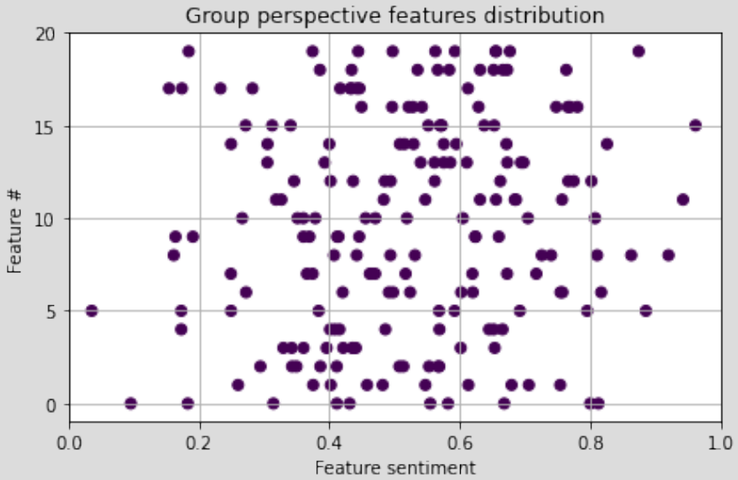
*A computational method*

# Group homogeneity, intuitively



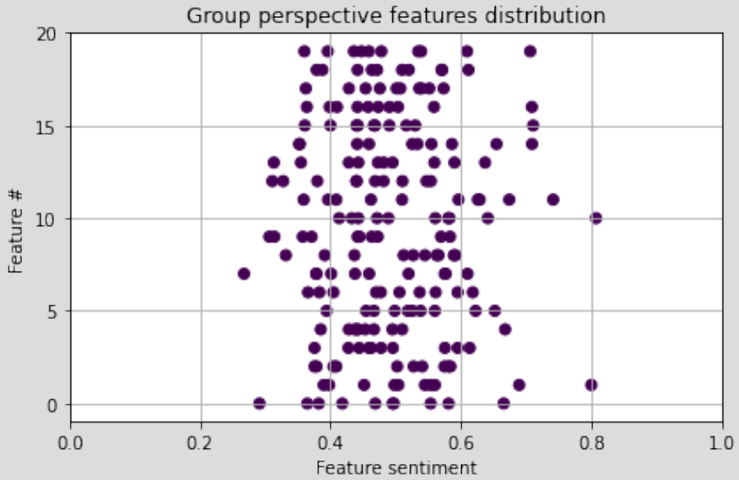

$0 \leq \mu \leq 1$
$0.01 \leq \sigma \leq 0.9$

homogeneity = **0.28**8236




$0.4 \leq \mu \leq 0.6$
$0.1 \leq \sigma \leq 0.3$

homogeneity = **0.89**3648

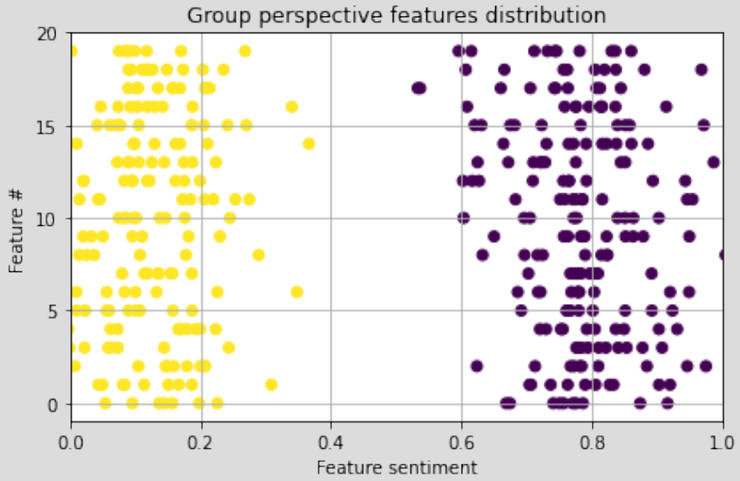



$\mu = 0.5$
$\sigma = 0.1$

homogeneity = **0.96**3887

*A computational method*

# Extremity ignored




homogeneity = **0.75**9381

Higher in-group closeness cancels out between-group differences

Will need other metrics for extremity of positions

*A computational method*

# A metric emerges: homogeneity

Estimated from a little information about the discussion and participants

Every group can have a calculated homogeneity score

One of many possible variables that can be predetermined

Can it predict something about discussion productivity?

# Study proposal

A way to evaluate this metric's effect on discussion productivity in a real situation

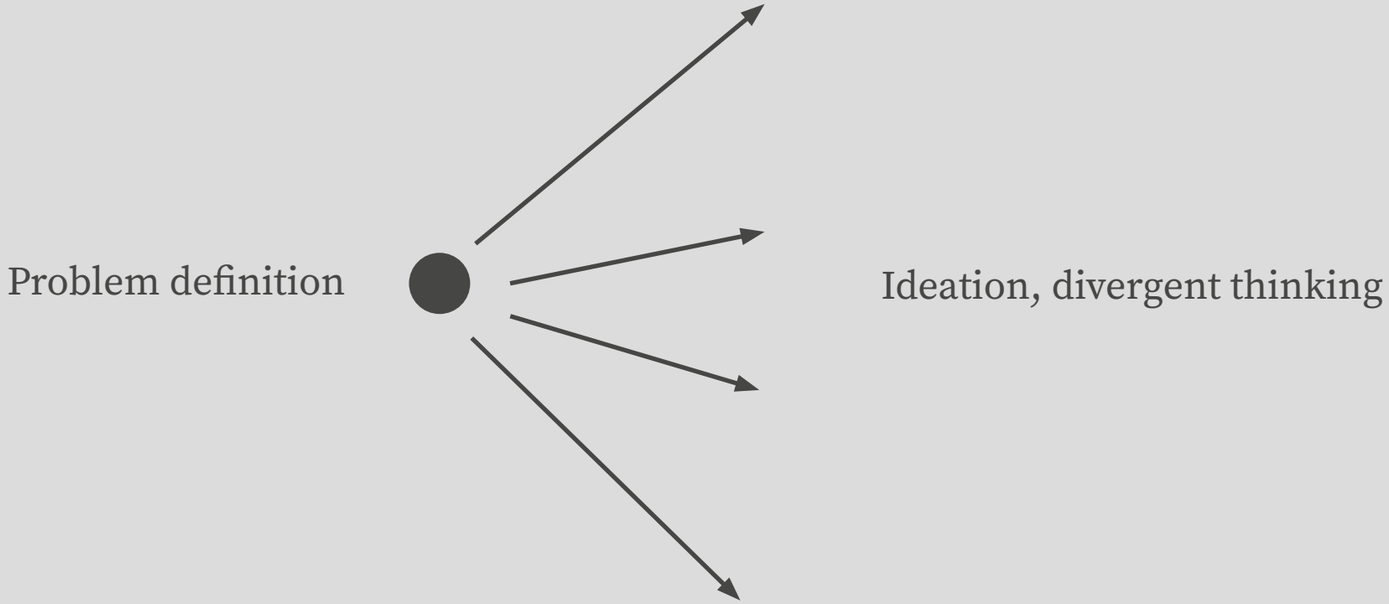
# An assessment framework

Will need to determine if homogeneity is predictive of discussion productivity

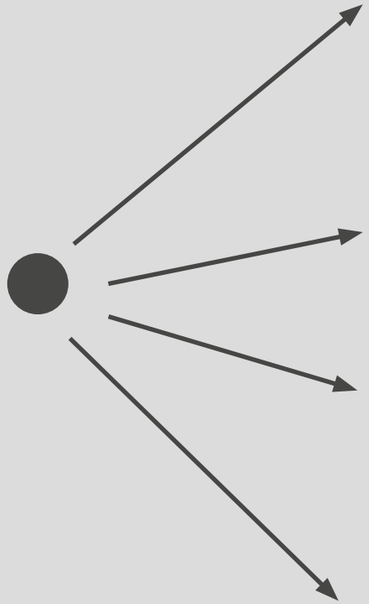
What does productivity mean in this context?

What are the features in the relevant perspective vector?

# What does productivity mean?



# Somewhat objective measures



Quantity of possible solutions

Diversity of solution types

Adherence to original outcome goal

# Relevant perspective features

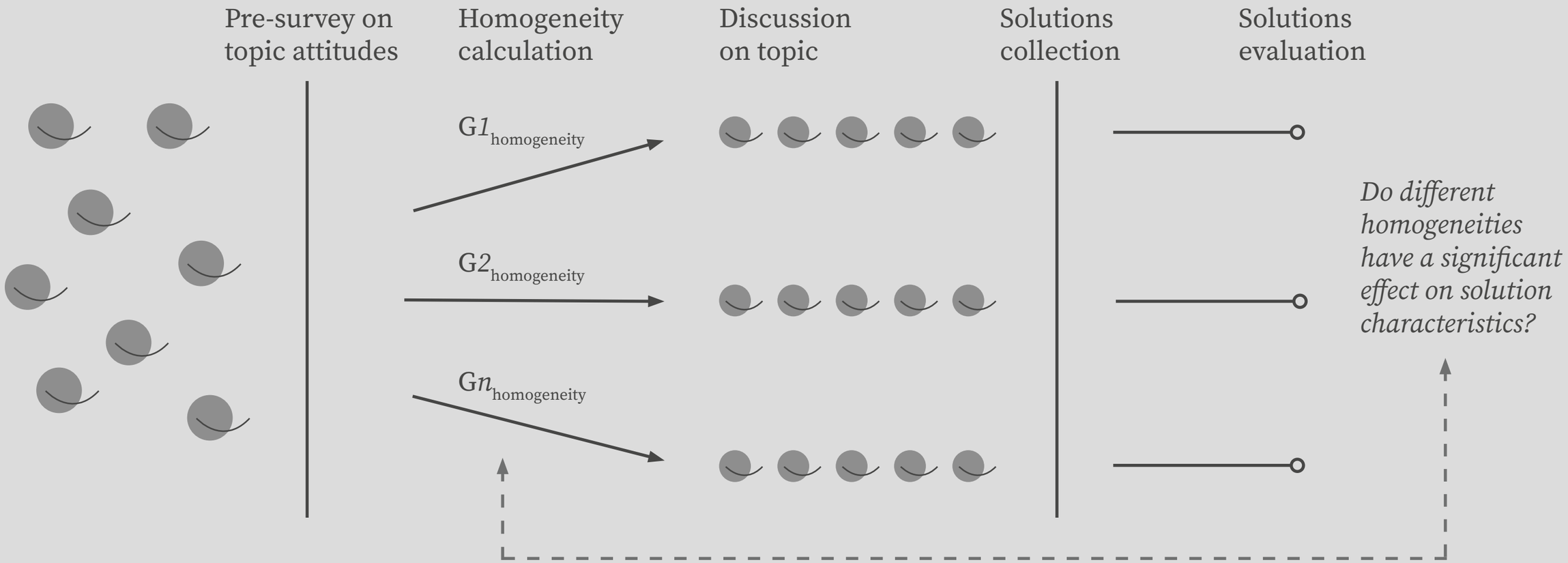
Perspective comes from discussion goal

Select a topic for a group to discuss

Pre-survey on topics related to discussion topic

More dimensions will emerge through discussion; not a problem

# Study structure



# Area of concern: topic selection

The topic will determine what features are theoretically most relevant

Will require making assumptions about relevant features

Wicked problems: climate change, homelessness, immigration

Don’t want a perfect solution, do want a focused discussion

# References

Taylor, M. (2018). Exploring How Homophily and Accessibility Can Facilitate Polarization in Social Networks. Information (Basel), 9(12), 325.

Westfall, V. (2015). Perceiving Political Polarization in the United States: Party Identity Strength and Attitude Extremity Exacerbate the Perceived Partisan Divide. Perspectives on Psychological Science, 10(2), 145–158.

# Q&A