

Setting the tone

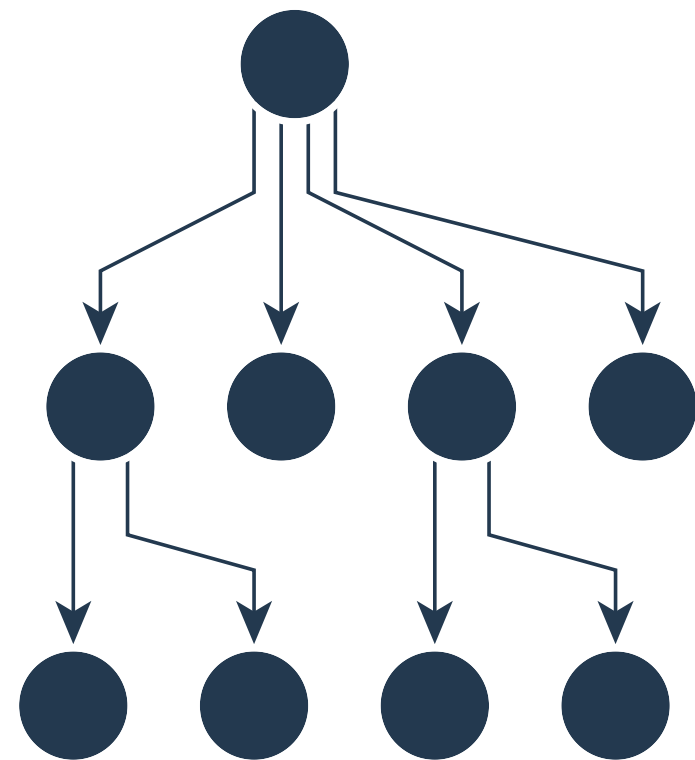
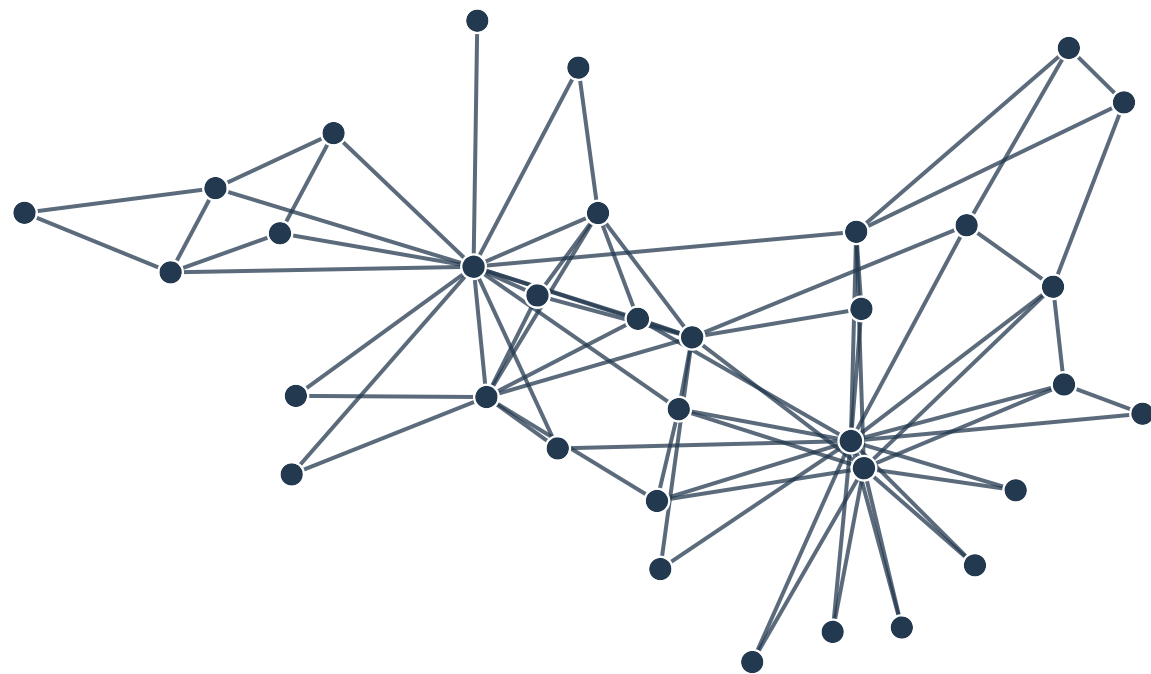
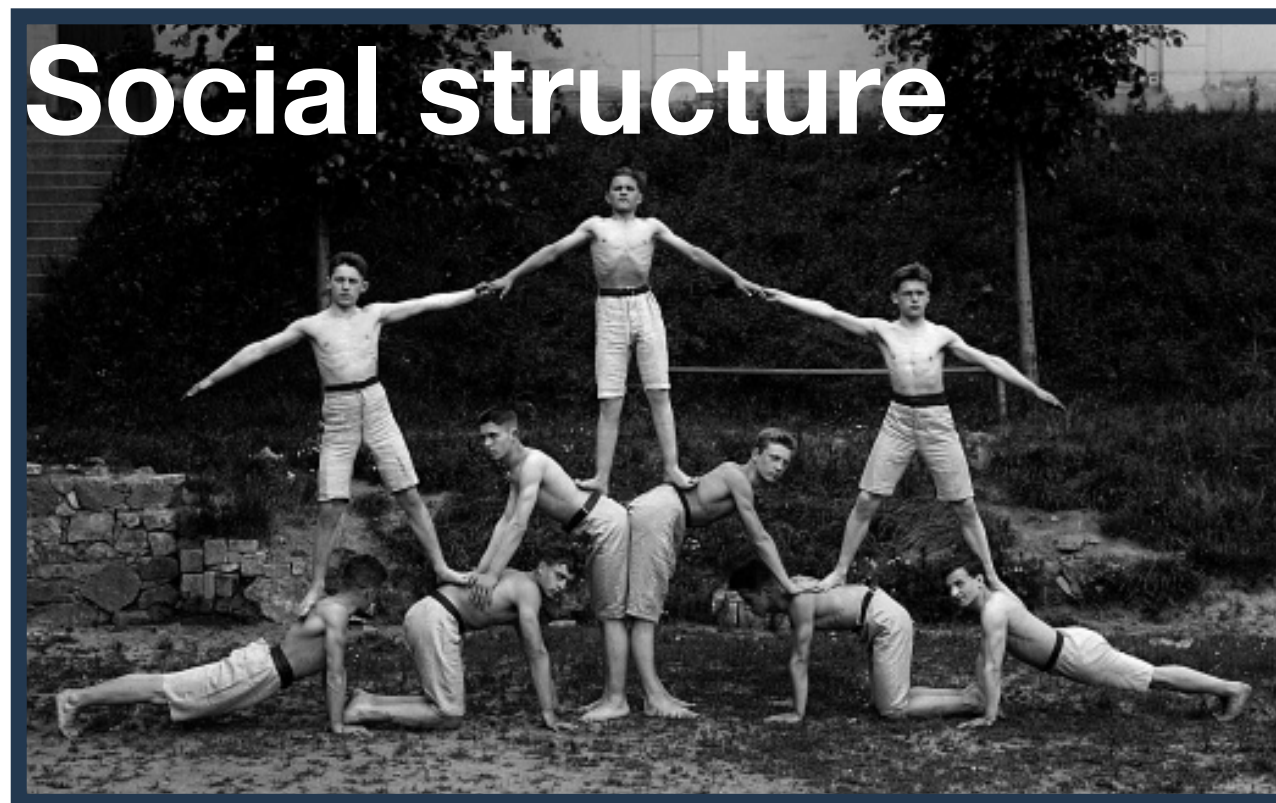
How talk reveals
relational structures
of power

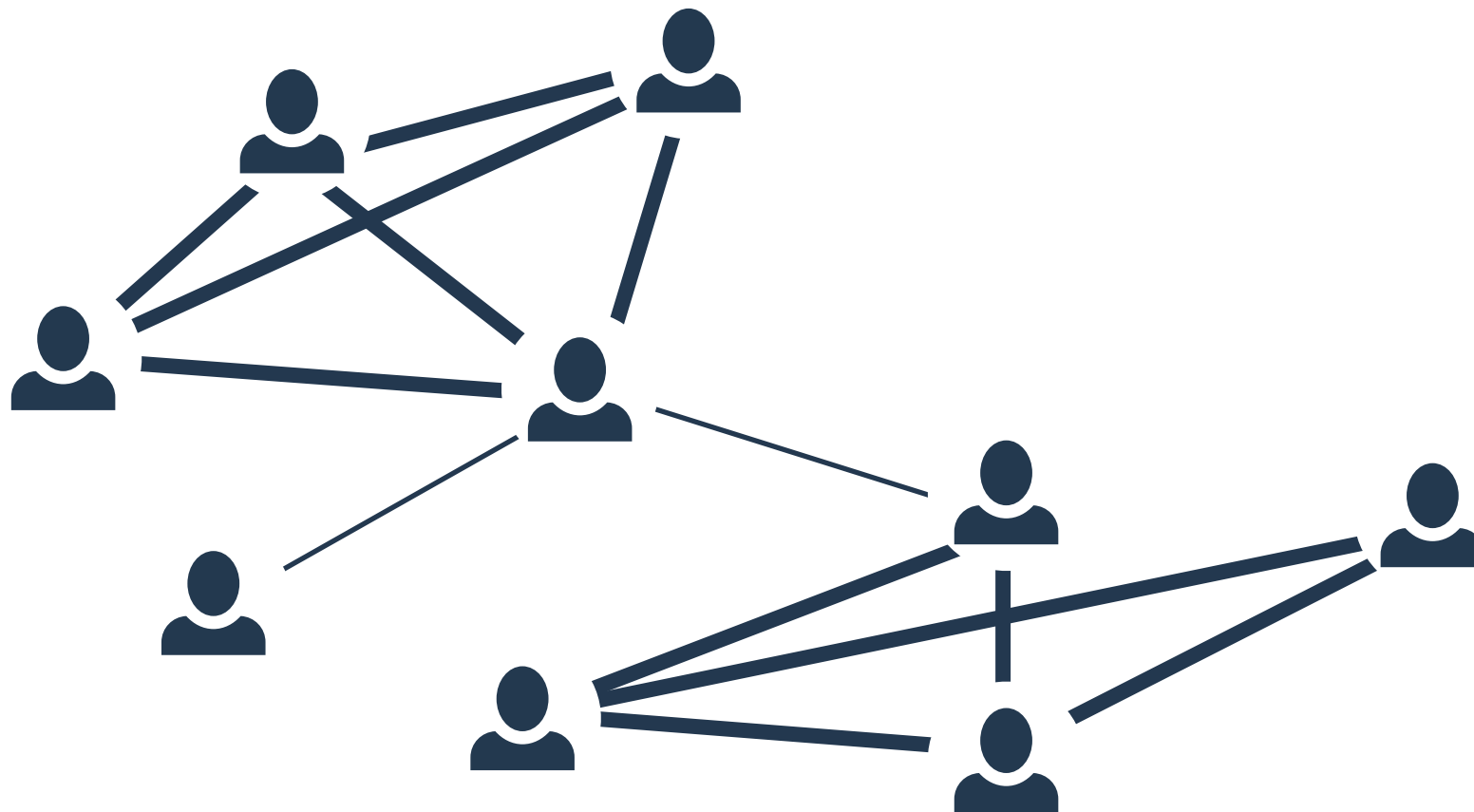
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- 1. Motivation**
- 2. ExComm and the Cuban Missile Crisis**
- 3. Linguistic style matching**
- 4. Modelling group linguistic accommodation**
- 5. Individual orientation and group structure (results)**
- 6. Related Work**

1. Motivation

Motivation





Traditional networks as relational representations are often lacking

- **Self-report (e.g. name generators)**
“Flattened” representations
Relies on trustworthy, unbiased recall
- **Transactional (e.g. email traces)**
Focus on individual choice (often)
Symmetric relations

Motivation

Conversation

- Ubiquitous form of human interaction
- Individuals observing and reacting to each other
- Reveals relationships and group structure



Social structure

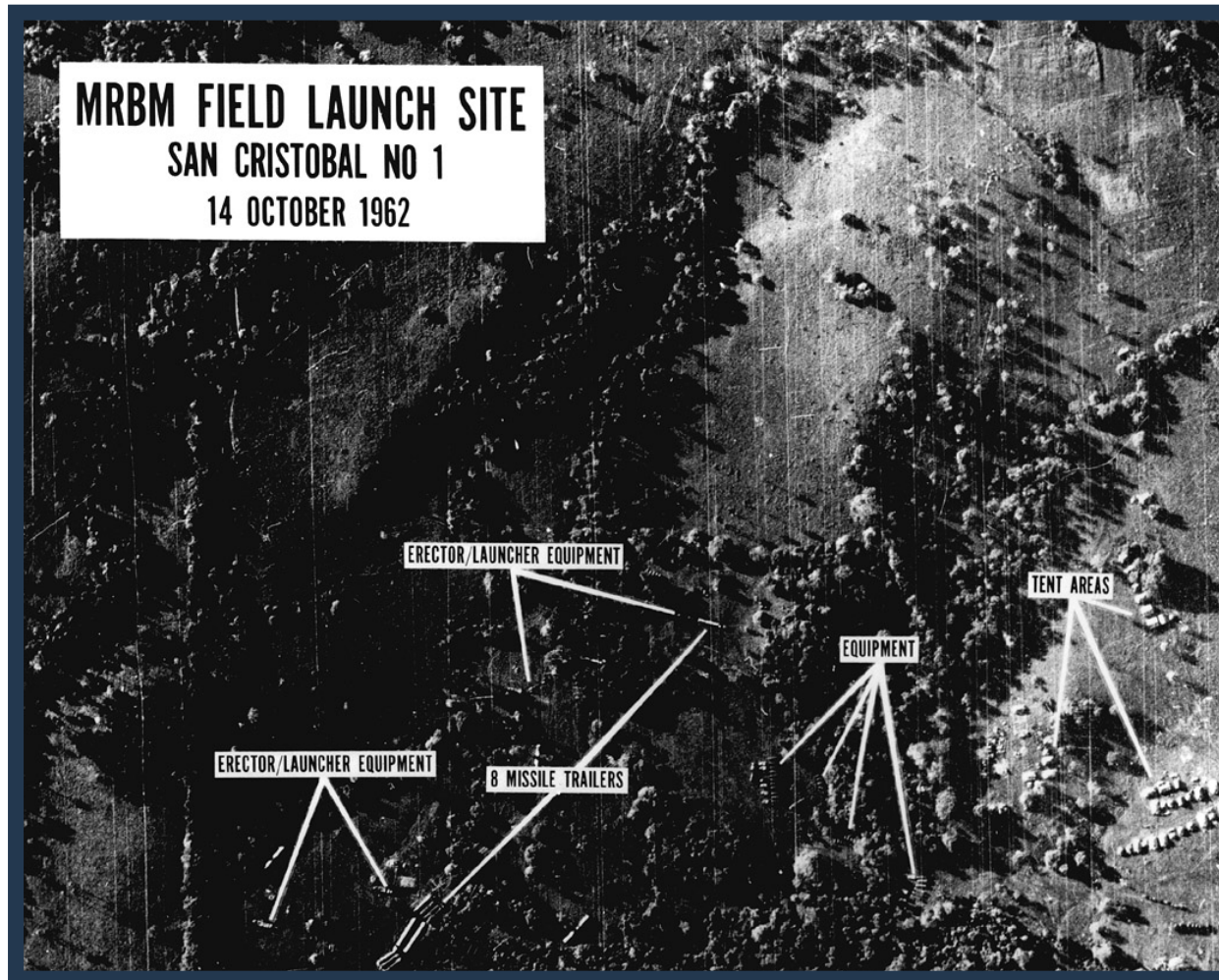


Language use

Natural language

- **Empirical trace of unobserved aspects of human relations**
Reflect history, affect, social origins, etc.
- **Relational structures are negotiated through talk**
Patterns of relations are influenced by observable, reflexive features of expression.
- **Language is sensitive to context**
Conversations are process-based and react to changes in tone or situation.

2. ExComm and the Cuban Missile Crisis



October 1962: US intelligence discovered evidence of Soviet missiles in Cuba.

President Kennedy convened the ad-hoc Executive Committee of the National Security Council (ExComm) to advise on the US response.

The ExComm

Consequential

Potential for nuclear war

Ad-hoc

Situation negotiated *de novo*

Informal

Candid talk encouraged

Recorded

Most meetings secretly taped



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**Group
conversation**



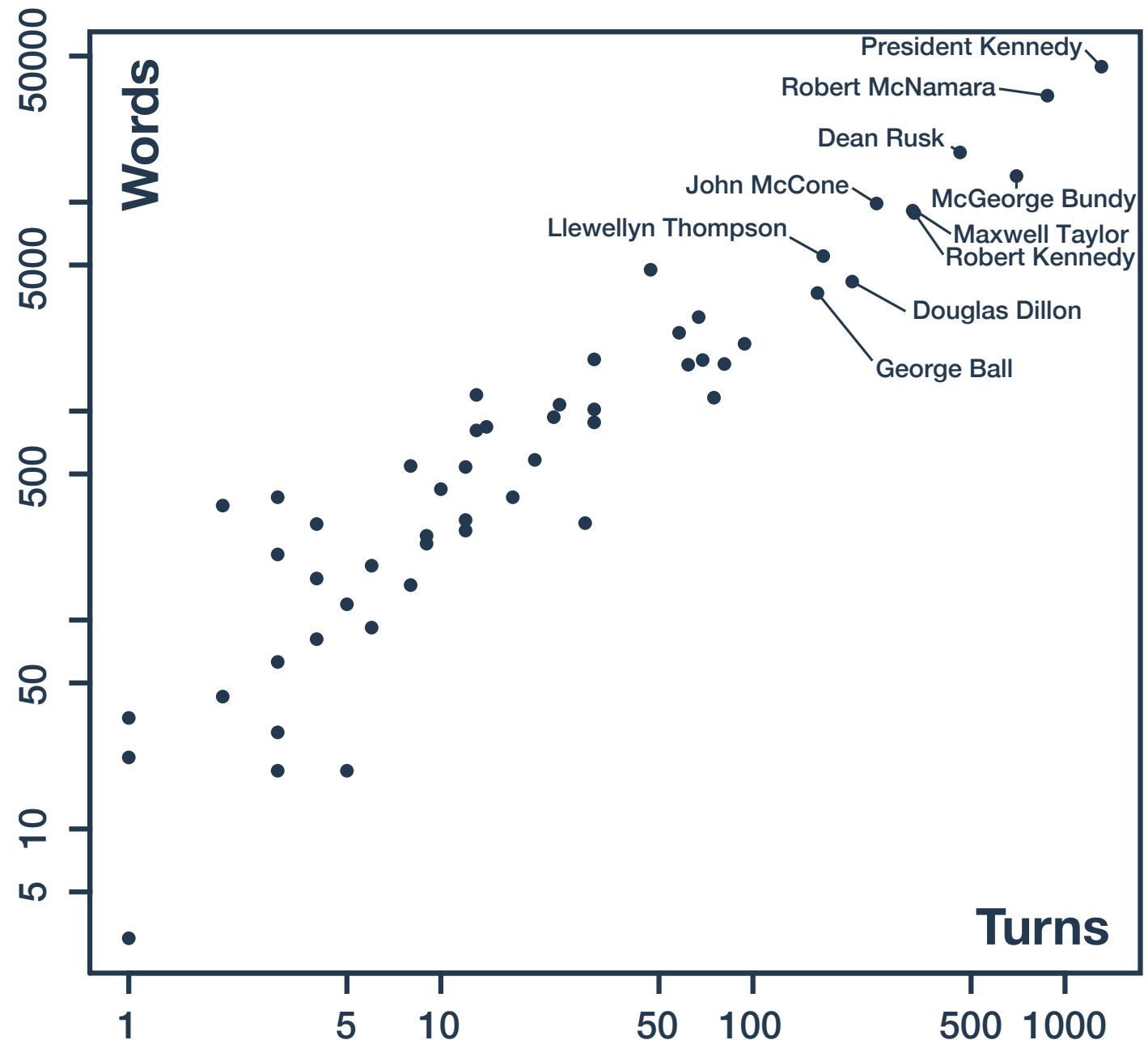
**Situated
relations**



**Contextualized
group structure**

The ExComm

- 16 transcribed meetings over 13 days
- 54 attributed speakers (16 “core” participants)
- 5,772 distinct conversation turns, dominated by a few active participants



3. Linguistic style matching

Language style



Individuals adjust their ‘style’ of communication to fit different social situations and audiences.

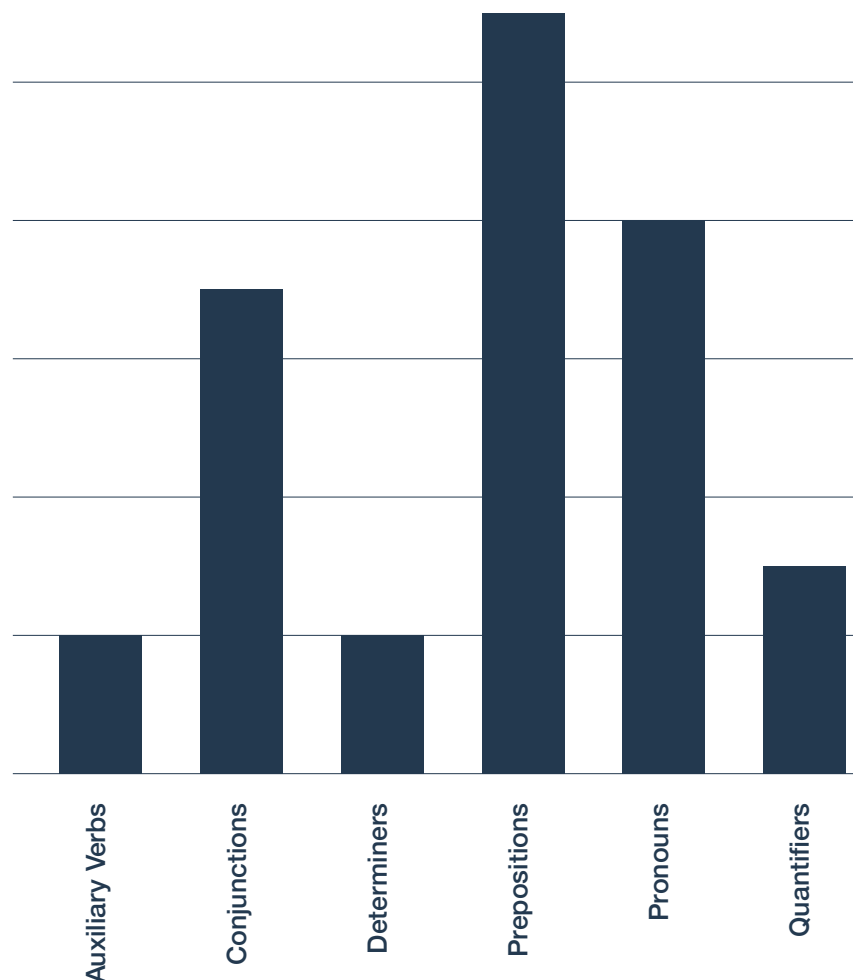
| *Code switching* between different languages/
dialects (Auer 1998)

| Adjusting *tone* to match social setting
(e.g. workplace, newspapers, academic talks)

Measuring linguistic style

Function words

Auxiliary verbs	(should, must, may, ...)
Conjunctions	(however, then, and, ...)
Determiners	(a, any, per, ...)
Prepositions	(above, of, through, ...)
Pronouns	(them, mine, anyone, ...)
Quantifiers	(many, each, some, ...)

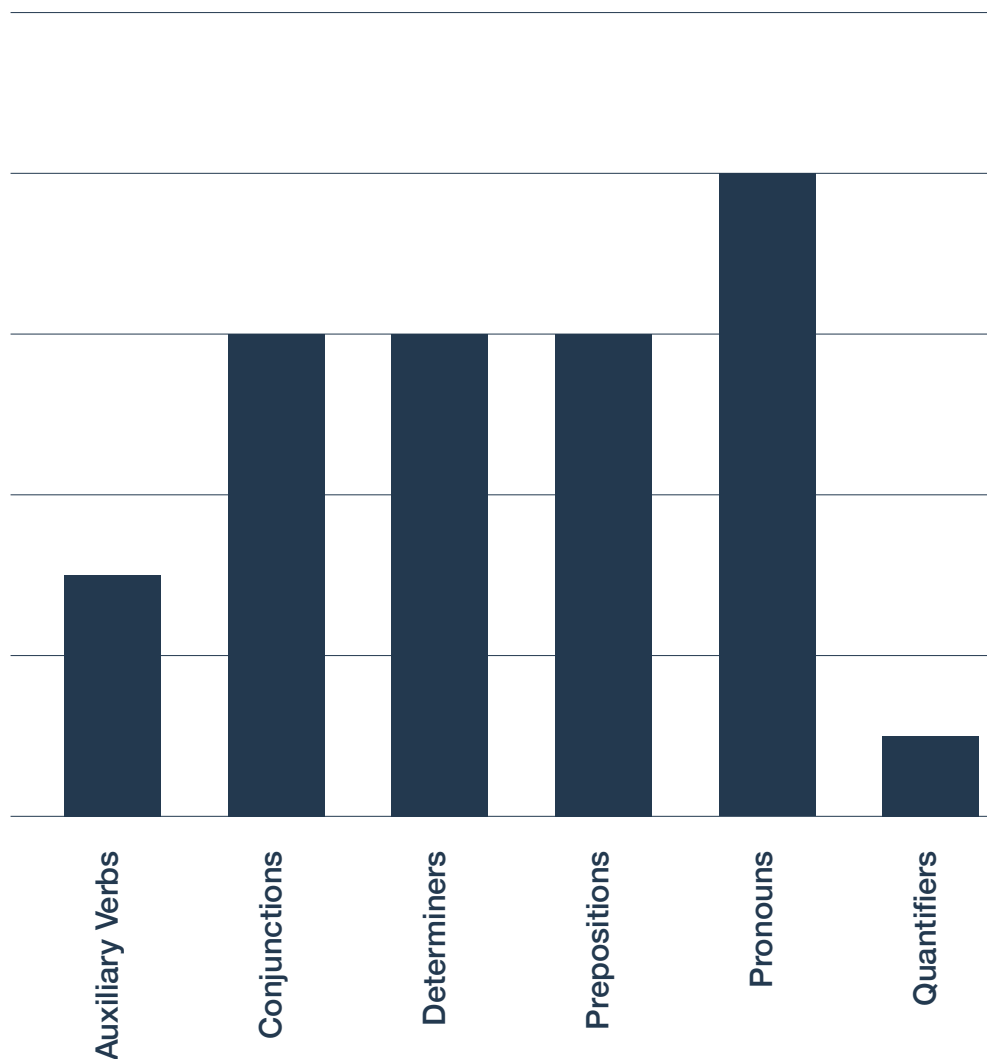


Frequency of *function words* provides a simple and effective way to generate a 'signature' to differentiate linguistic styles. (Chung and Pennebaker 2007)

Measuring linguistic style

Maxwell Taylor:

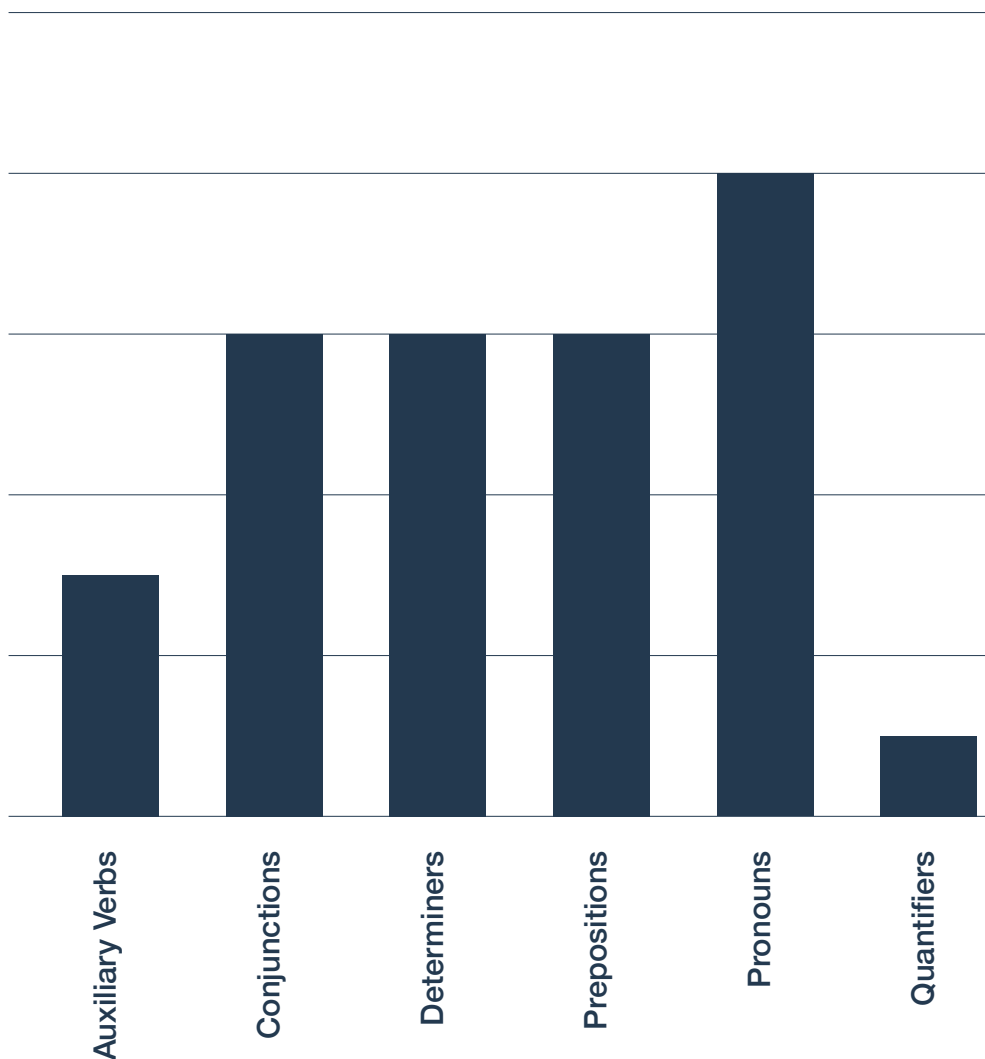
Mr. President, I should say that the Chiefs and the commanders feel so strongly about the dangers inherent in the limited strike that they would prefer taking no military action rather than to take that limited first strike. They feel that it's opening up the United States to attacks which they can't prevent, if we don't take advantage of surprise.



Measuring linguistic style

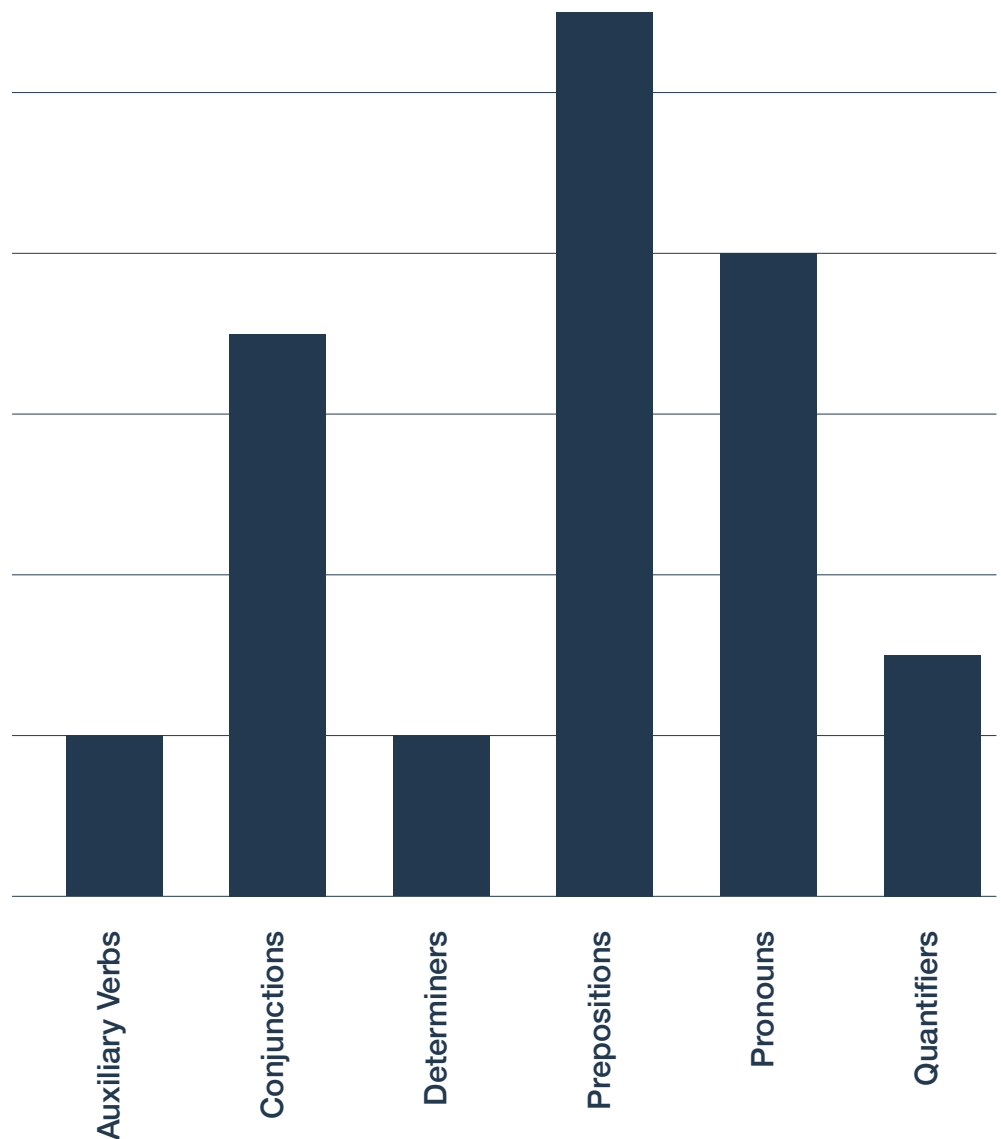
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Robert McNamara:

You can't just throw more of what we're now doing, because ... And then we need to have two things ready: A government for Cuba, because we're going to need one after we go in with bomber aircraft. And, secondly, plans for how to respond to the Soviet Union in Europe because sure as hell they're going to do something there.



Style matching

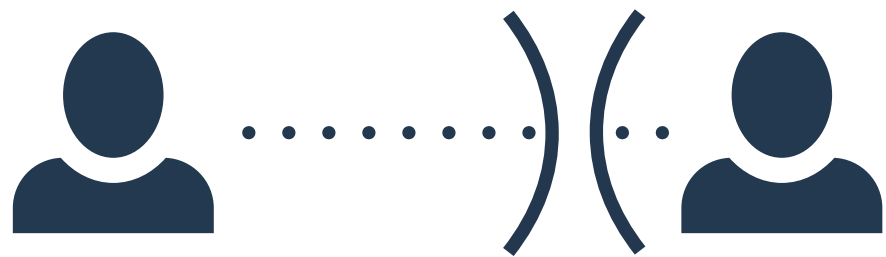


Individuals match linguistic style to conversation partners'.

When an interaction is going 'well' the language style of the participants tends to converge.
(Ireland et al 2011; Gonzales et al 2009)

Linguistic style matching (LSM) predicts, e.g., tipping in restaurants (van Baaren et al. 2003), success of hostage negotiations (Taylor and Thomas 2008), and fruitful police interrogations (Richardson et al. 2014)

Style matching



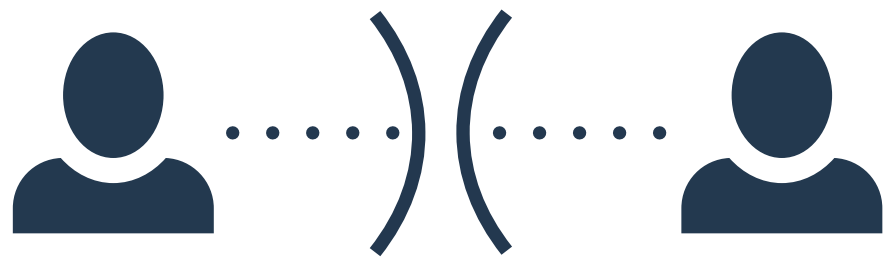
Asymmetry in linguistic accommodation associated with situated perceptions of status.

Imbalances in power and influence are associated with asymmetry in matching.
(Danescu-Niculescu-Mizil et al. 2011;
Richardson et al. 2014)

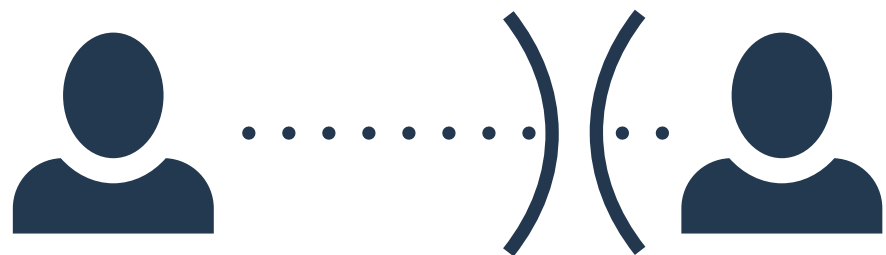
Style matching



Individuals adjust their ‘style’ of communication to fit different social situations (code switching).



Individuals match linguistic style to conversation partners’.

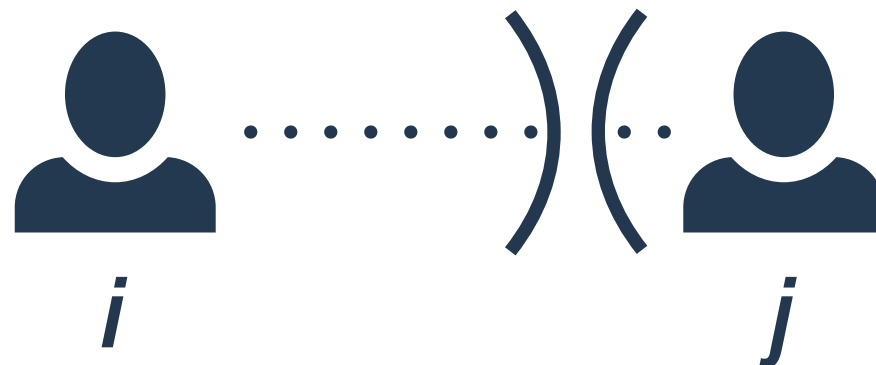


Asymmetry in linguistic accommodation associated with situated perceptions of status.

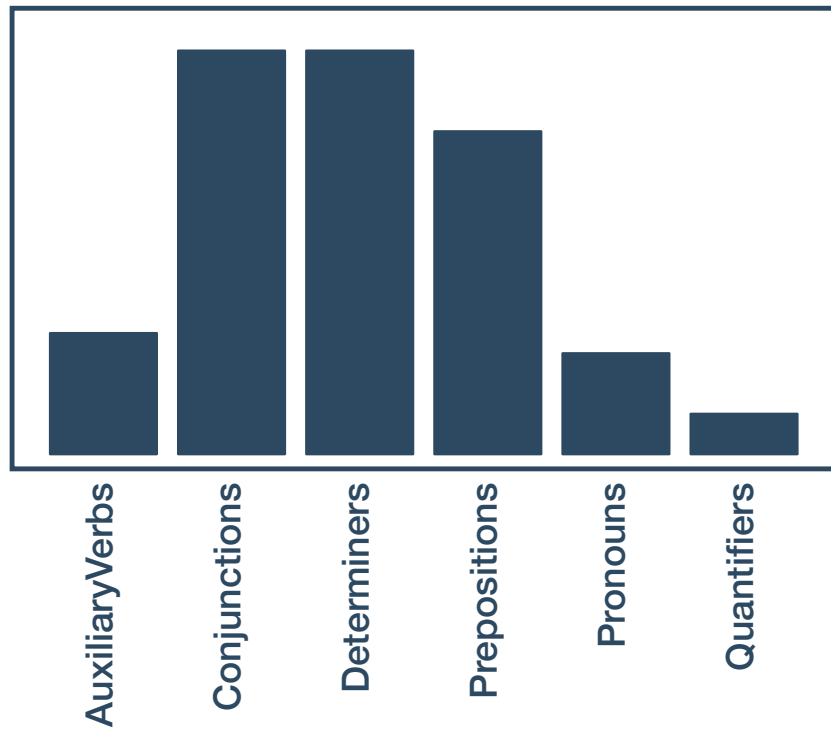
4. Modelling group linguistic accommodation

Goal:

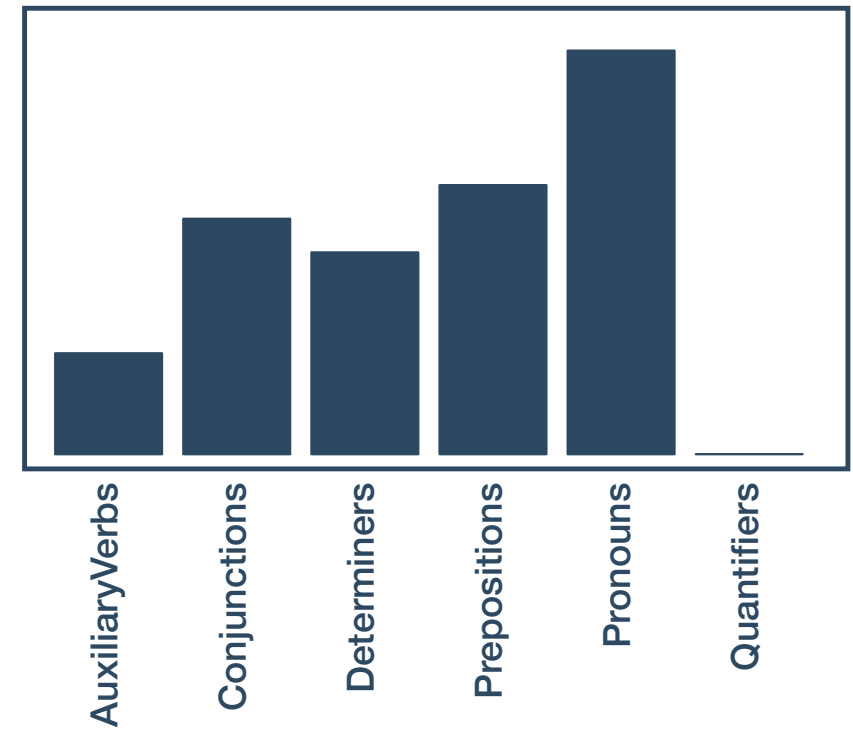
- Measure the amount of *directed* linguistic accommodation between every pair of members of the ExComm.
- For every pair (i, j) , estimate the degree to which person i adjusts their linguistic style in response to person j .

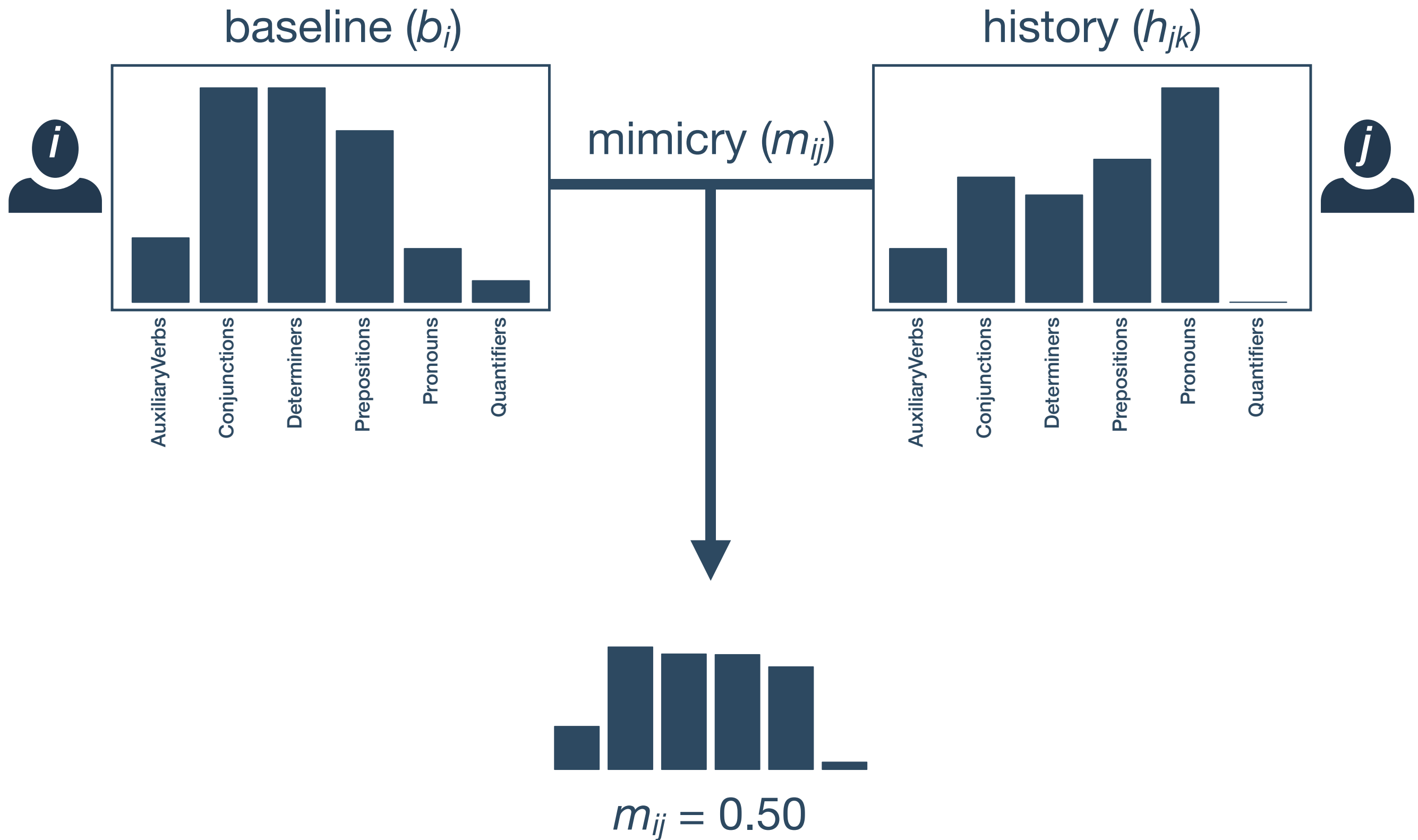


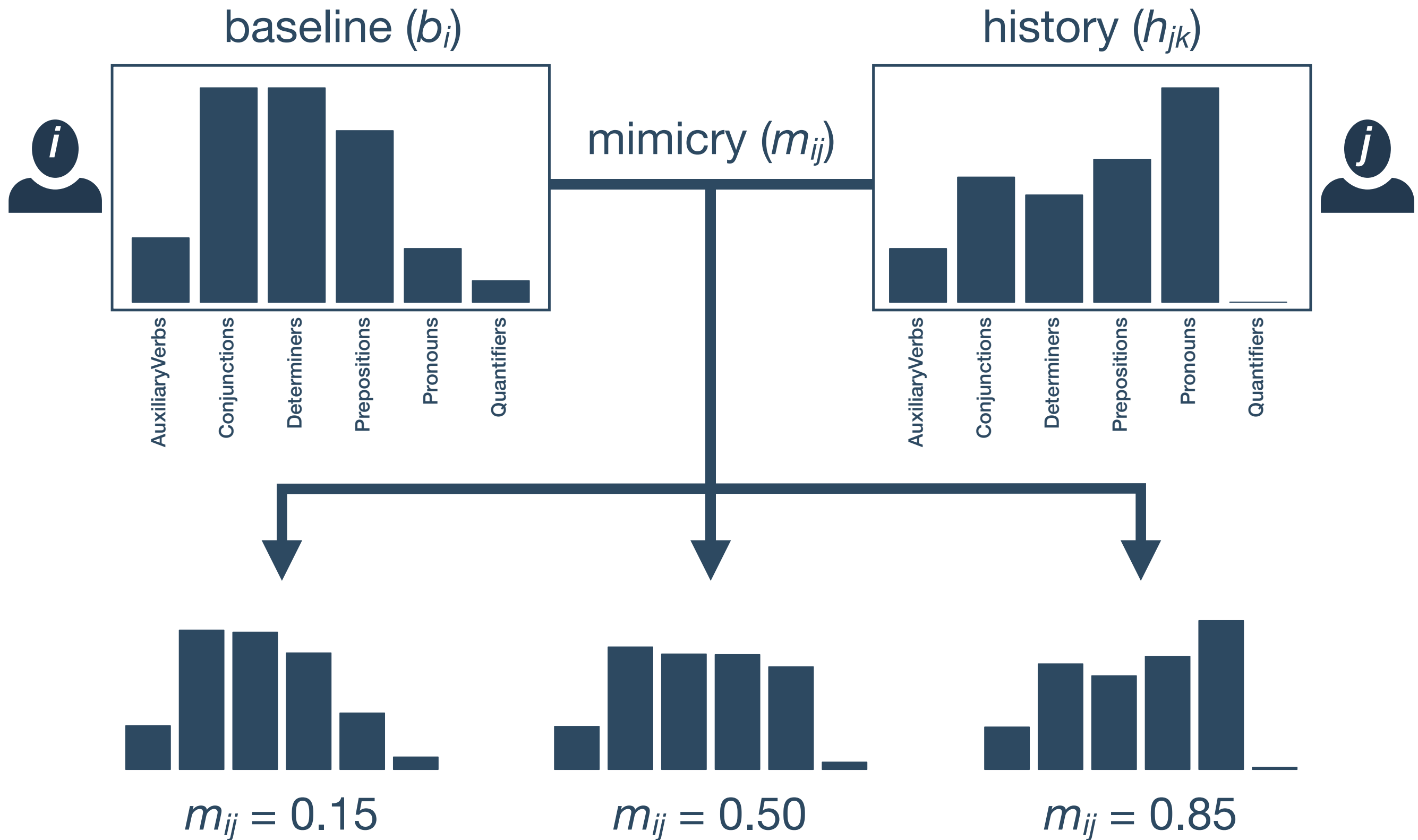
baseline (b_i)



history (h_{jk})







$$\mathbf{h}_{kj} = \frac{\sum_{k \in U(j,k)} \mathbf{f}_k}{1 \cdot \sum_{k \in U(j,k)} \mathbf{f}_k}$$

$$\mathbf{f}_k \sim \text{Multinomial} \left(m_{\bar{k},\bar{k}} \mathbf{b}_{\bar{k}} + \sum_{j \neq \bar{k}} m_{\bar{k},j} \mathbf{h}_{jk} ; \sigma_k \right)$$

$$\mathbf{b}_i \sim \text{Dirichlet}(a_b)$$

$$\mathbf{m}_i. \sim \text{Dirichlet}(a_m)$$

\mathbf{f}_k : function word count of utterance k

\mathbf{h}_{kj} : cumulative function word count by person j prior to utterance k in current meeting

\mathbf{b}_i : baseline style of person j (unobserved)

$\mathbf{m}_{i,j}$: degree to which person i accommodates person j

\bar{k} : index of speaker for utterance k

Model (estimation)

Parameters:

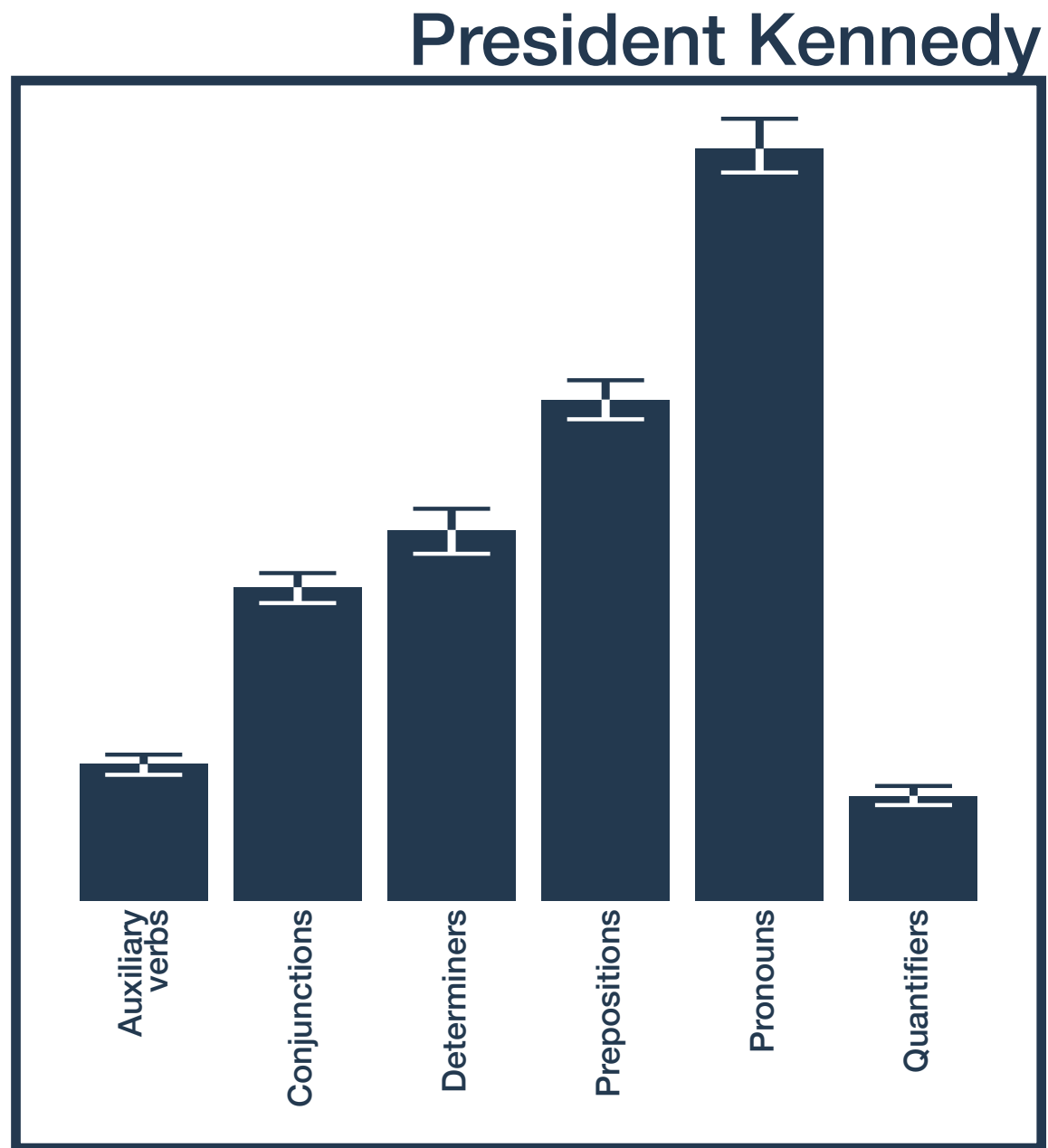
- Baseline linguistic style of each participant:
 $\mathbf{b}_i \in \Delta^6$
- Mimicry between each ordered pair of participants:
 $\mathbf{m}_{ij} \in [0, 1]; \sum \mathbf{m}_{i.} = 1$

Estimation:

- Markov Chain Monte-Carlo (MCMC)
- Generates posterior sample for each parameter
- Multiple parallel chains to verify convergence

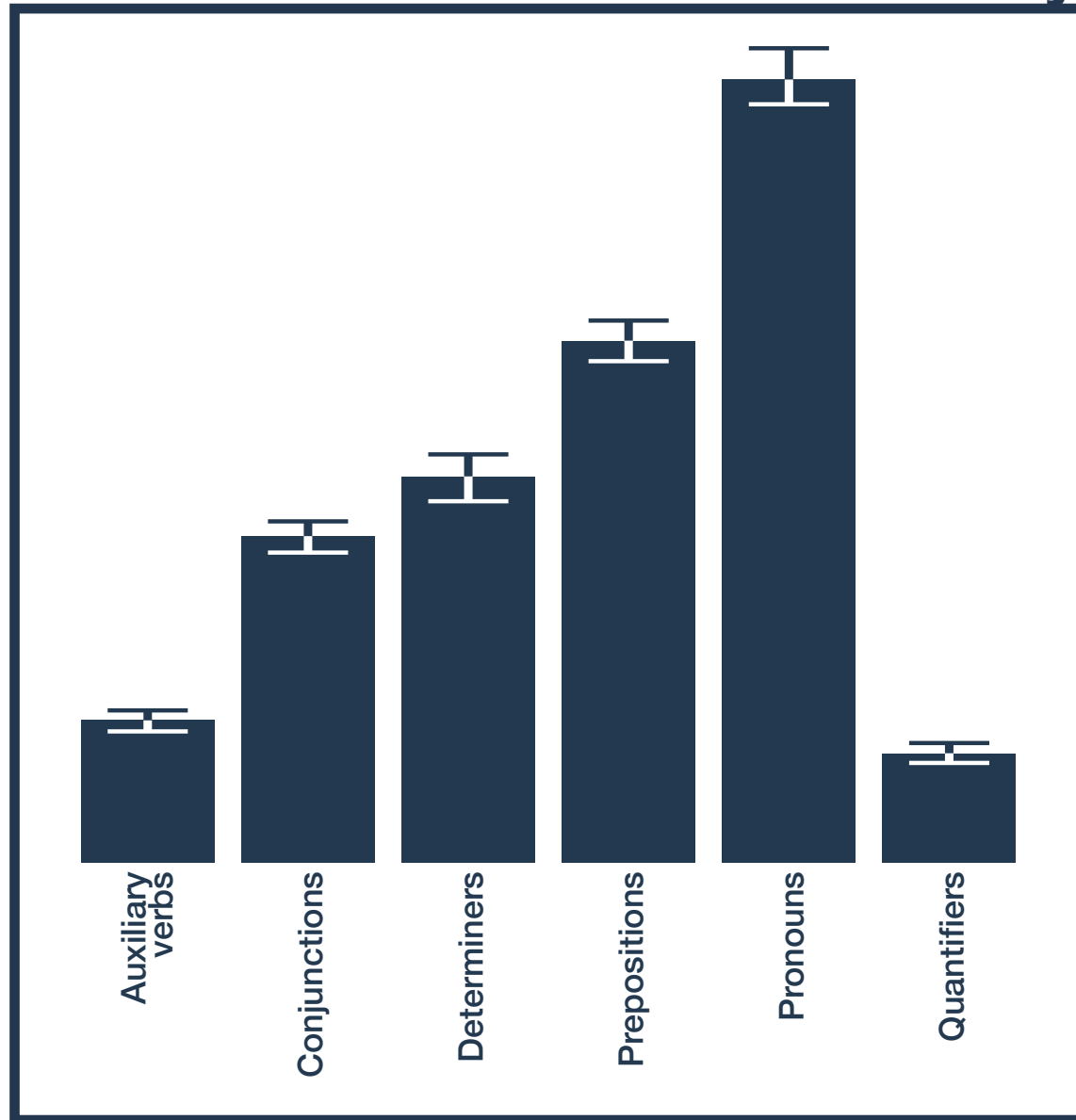
5. Individual orientation and group structure (results)

Results: baseline styles

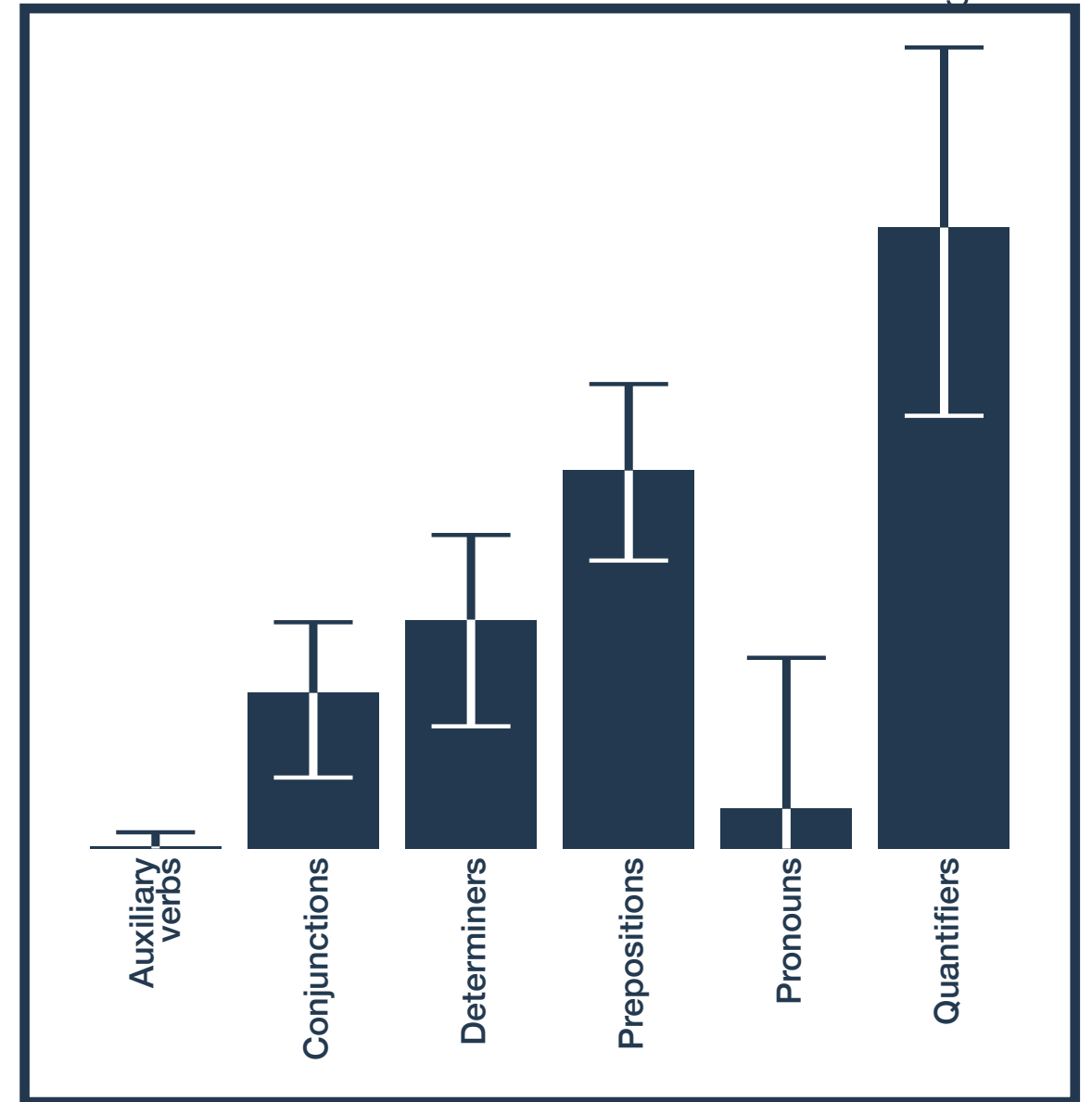


Results: baseline styles

President Kennedy



John McCone Director of Central Intelligence

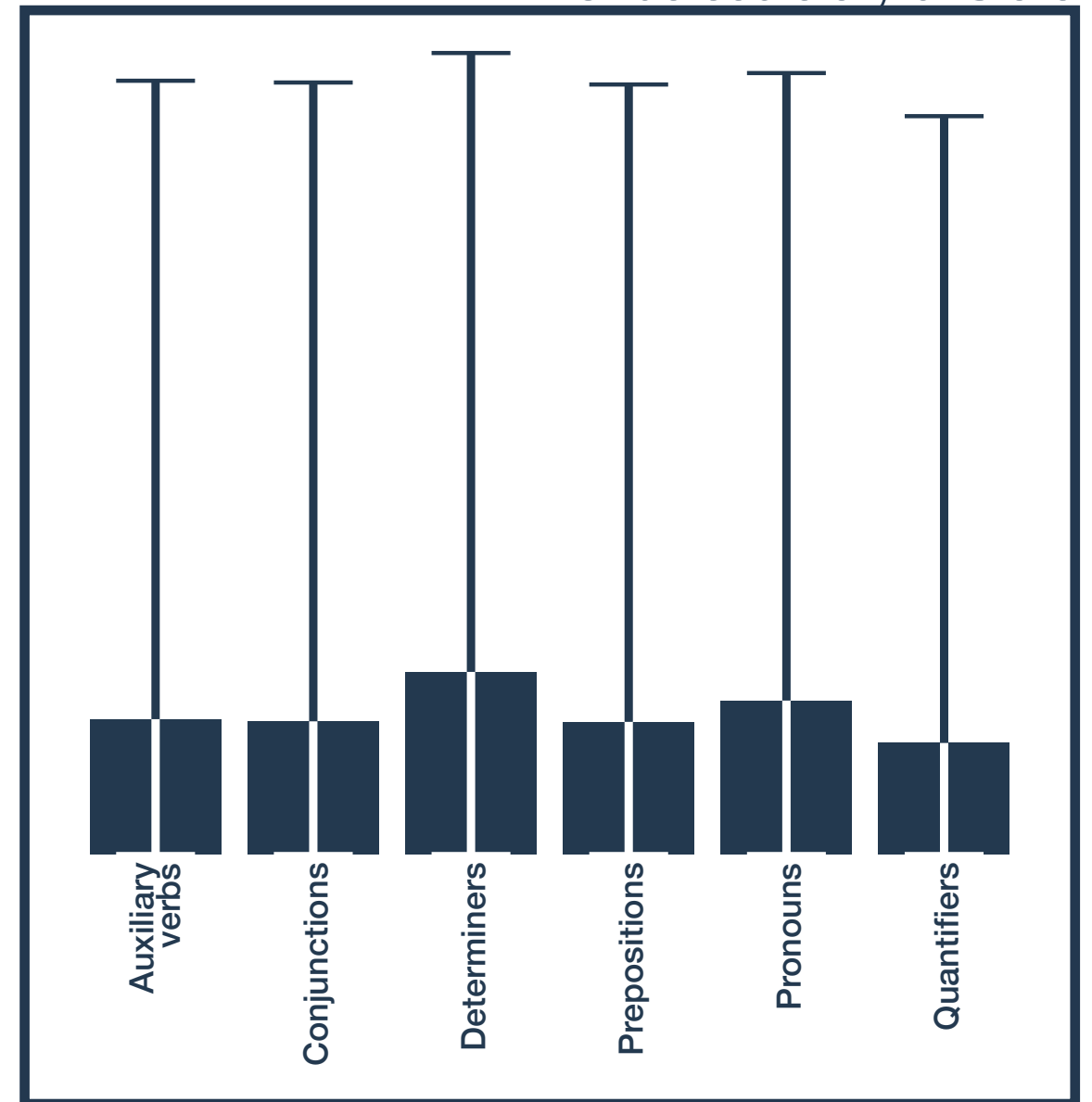


Results: baseline styles

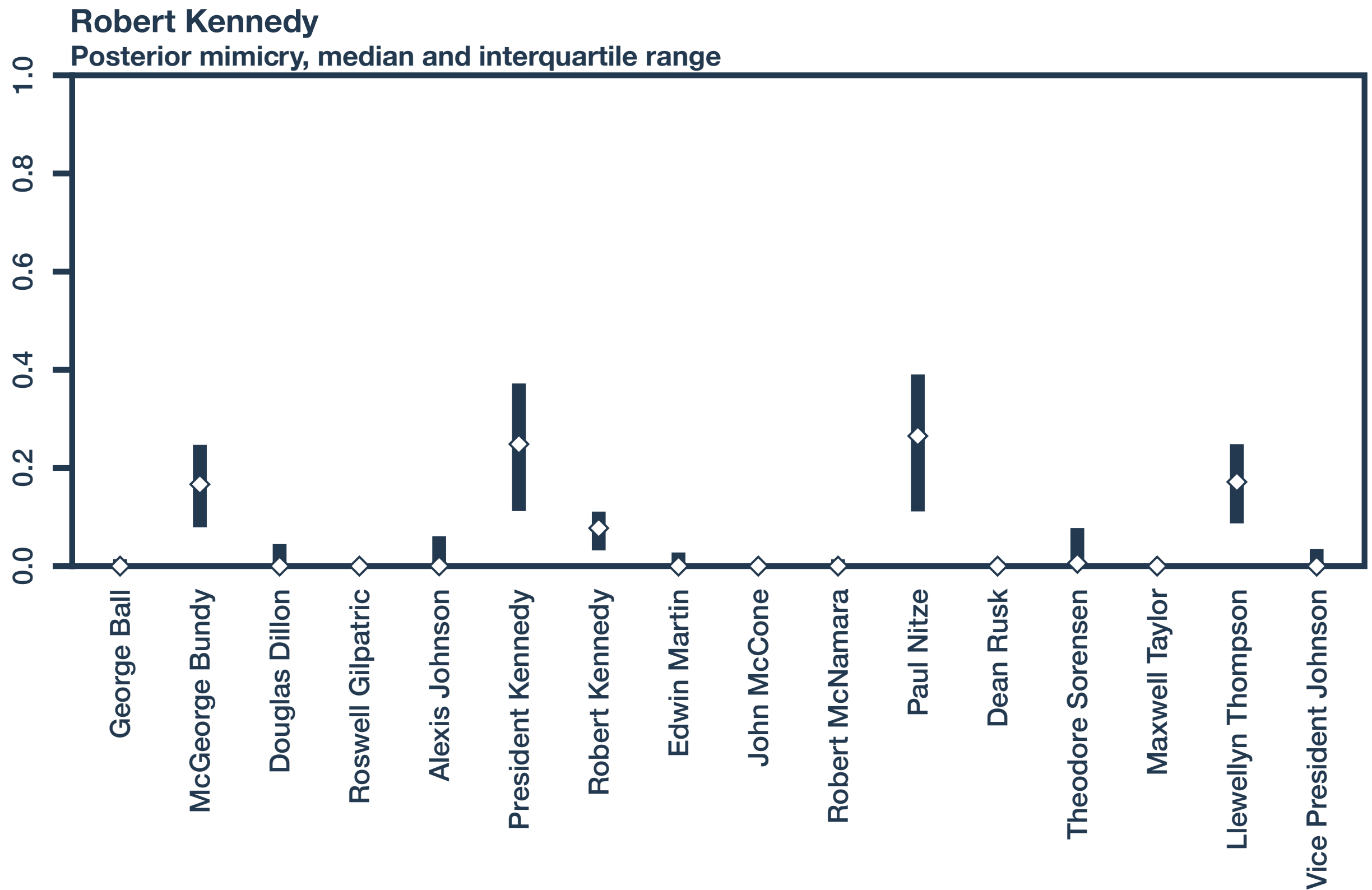
Two sources of uncertainty:

- Lack of data (limited speaking)
- High mimicry (style based on others' speech)

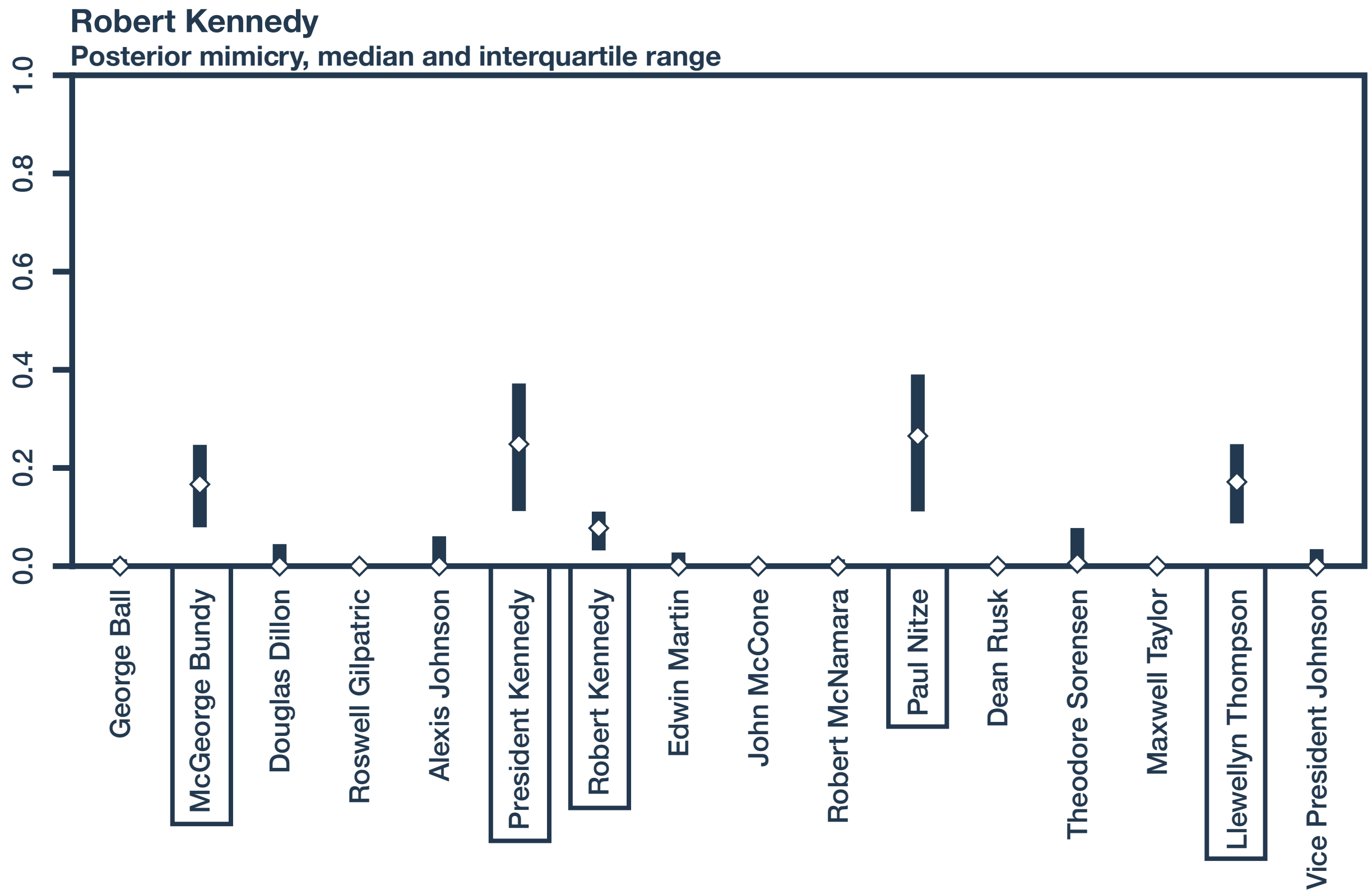
George Ball
Undersecretary of State



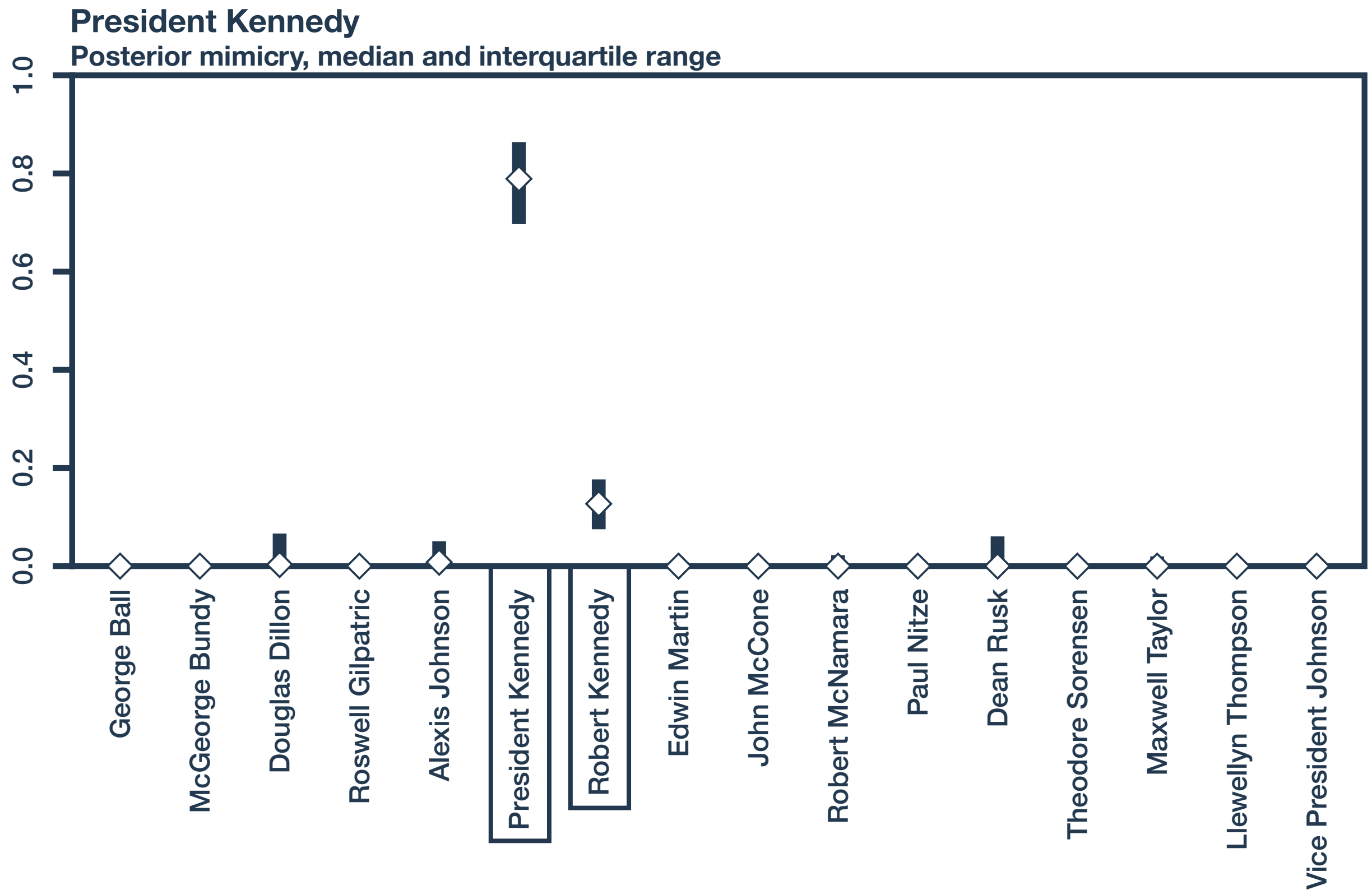
Results: individual orientation



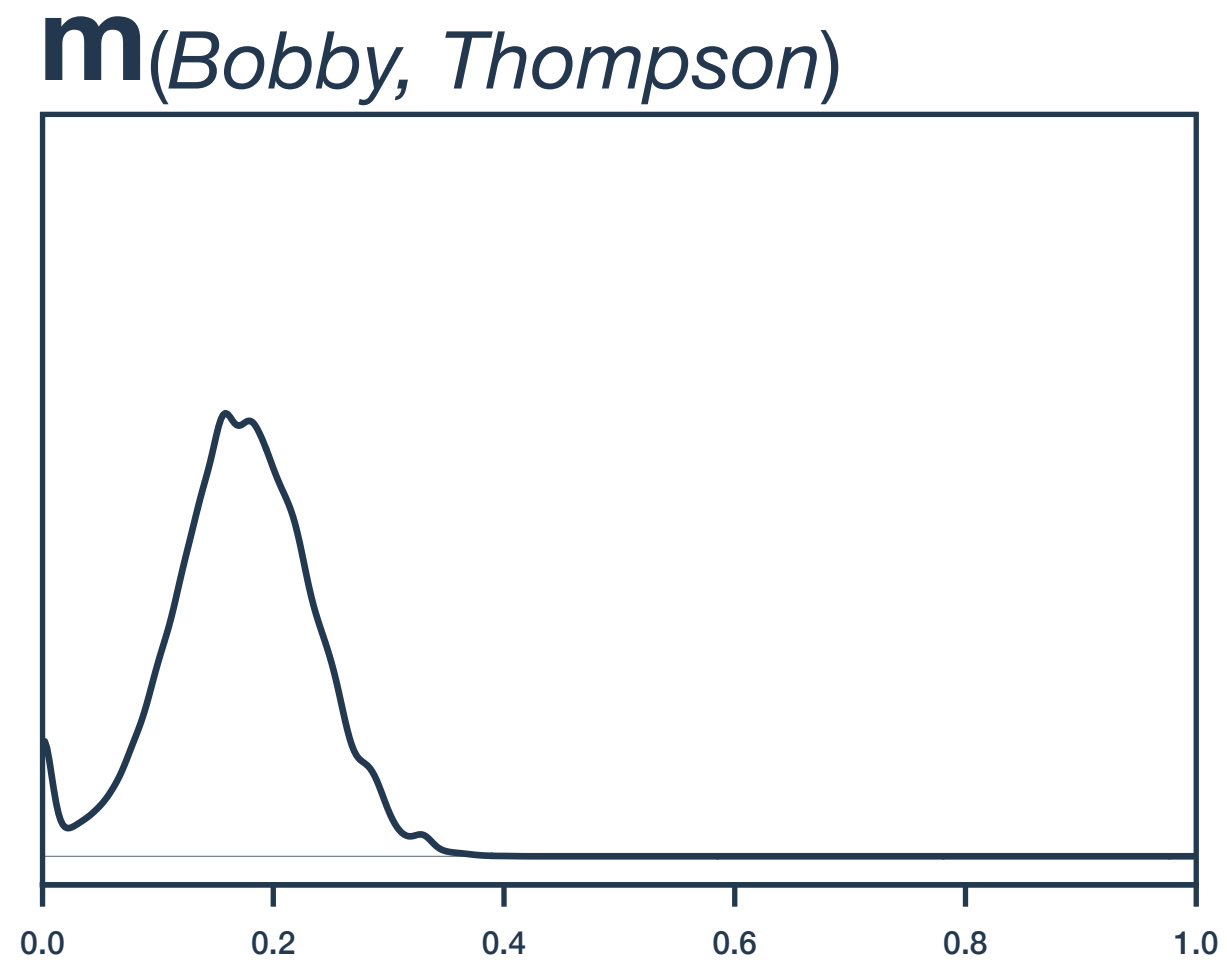
Results: individual orientation



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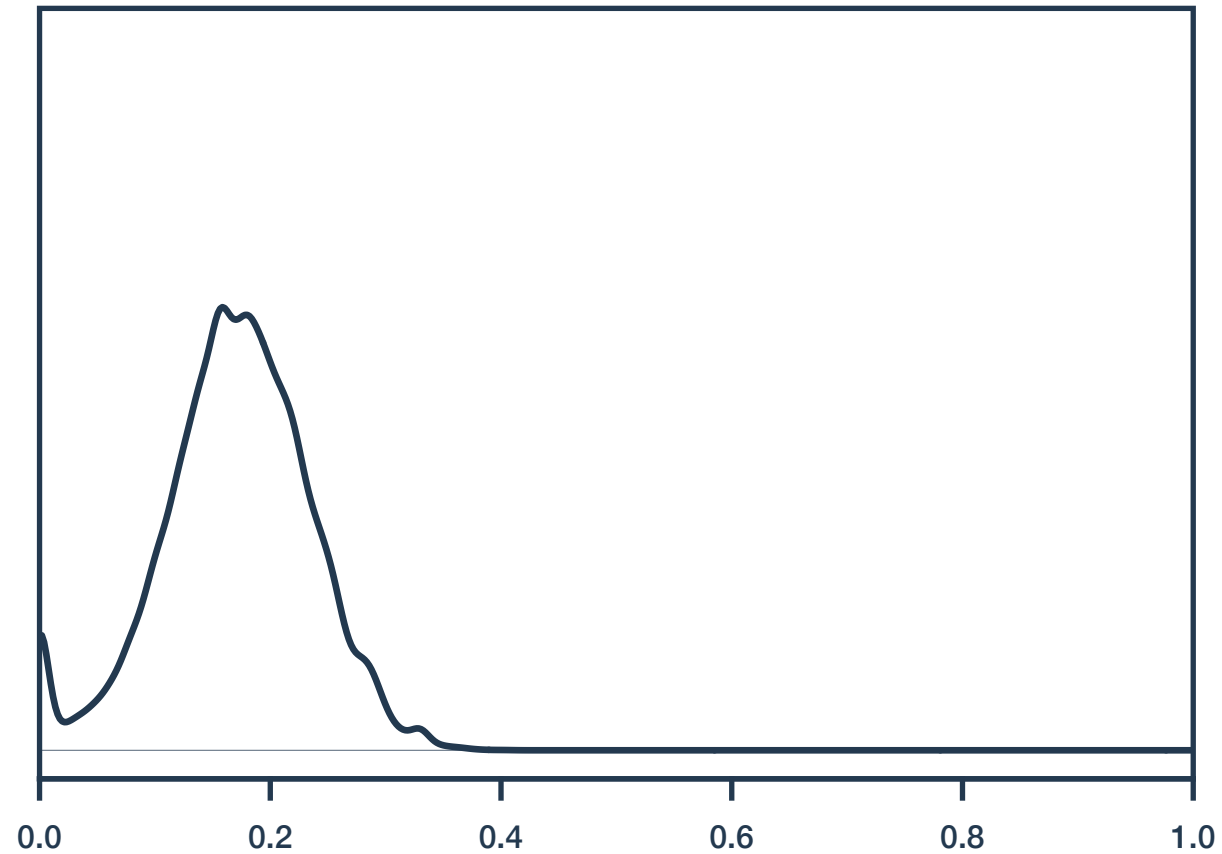


Results: pairwise mimicry

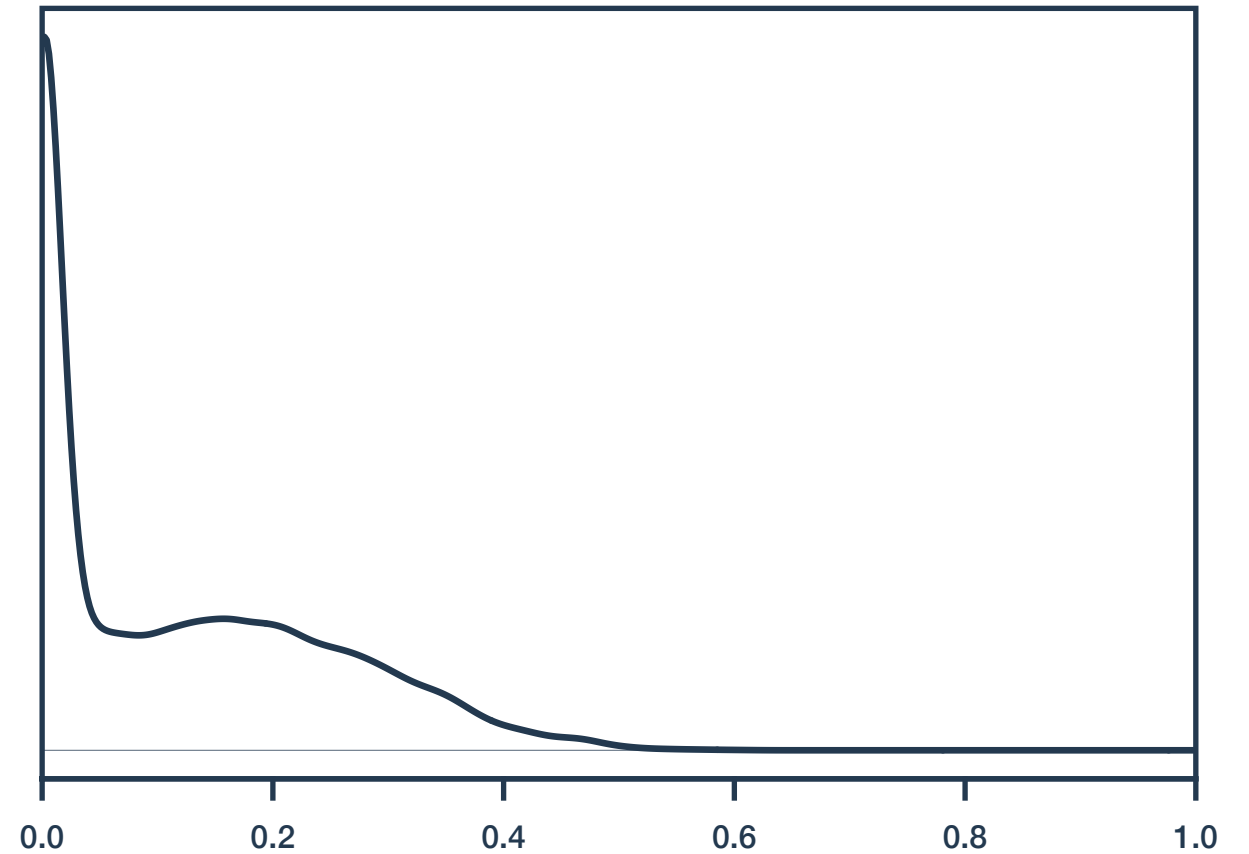


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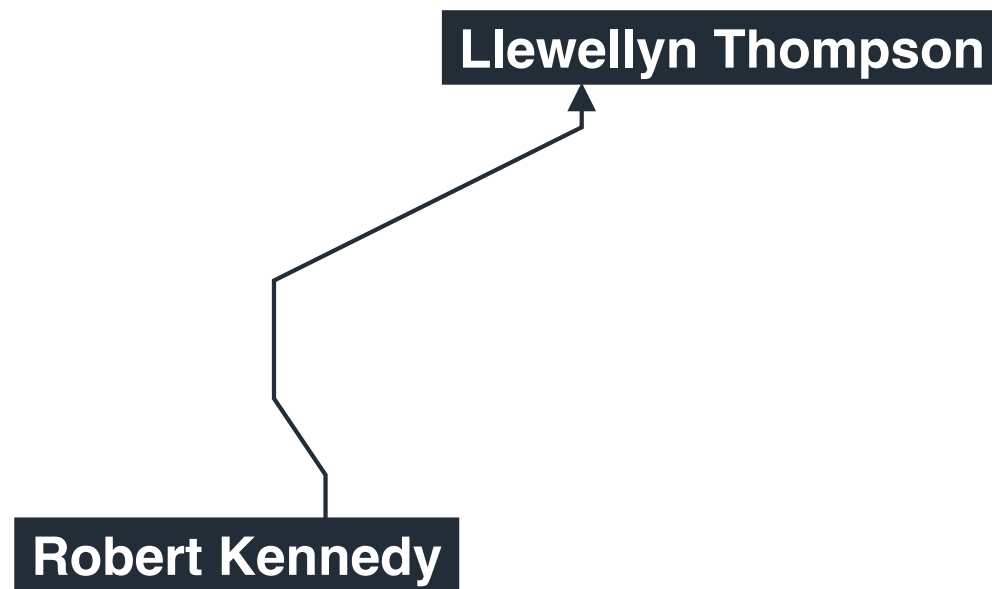
$\mathbf{m}(\text{Bobby, Thompson})$



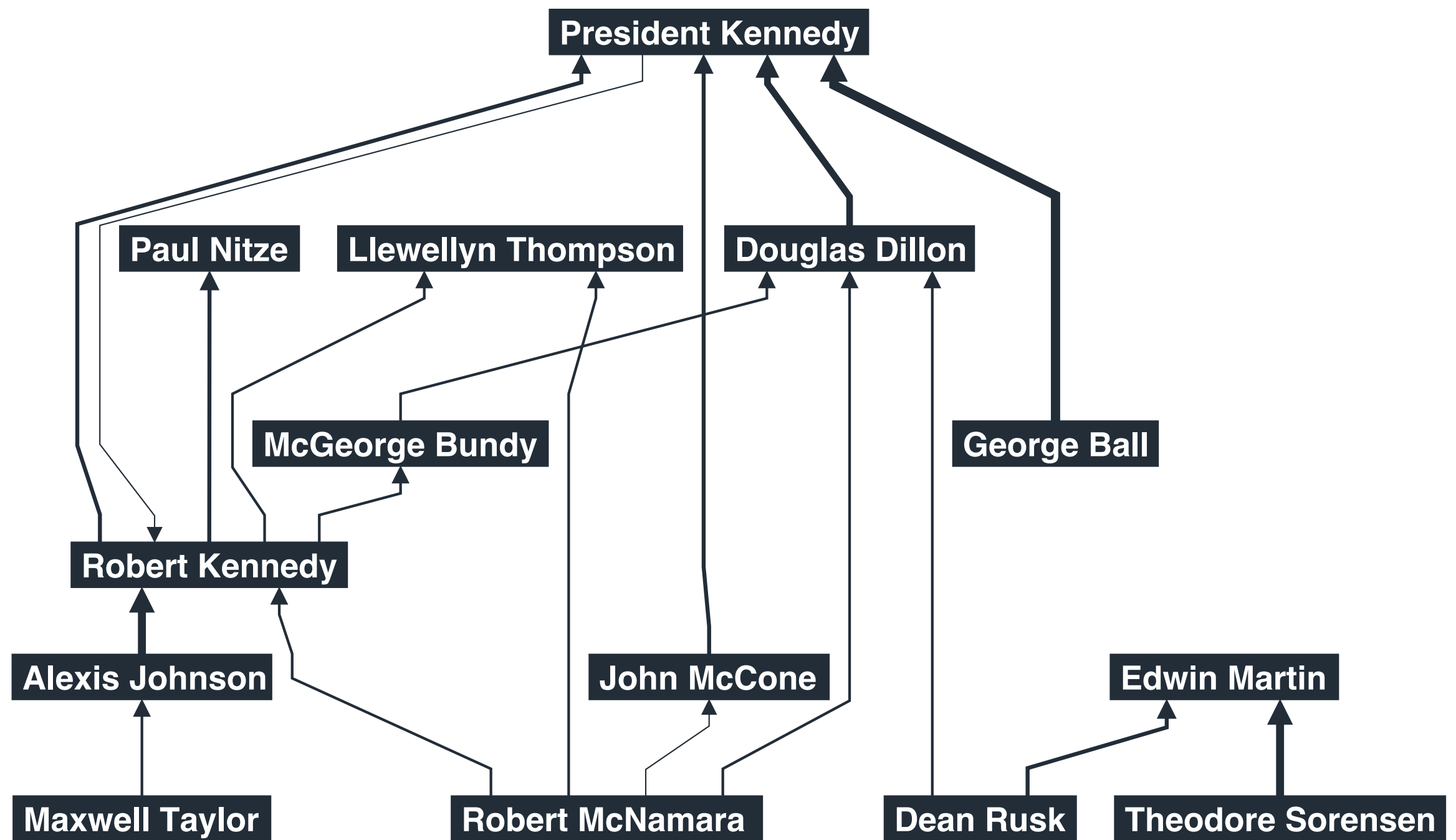
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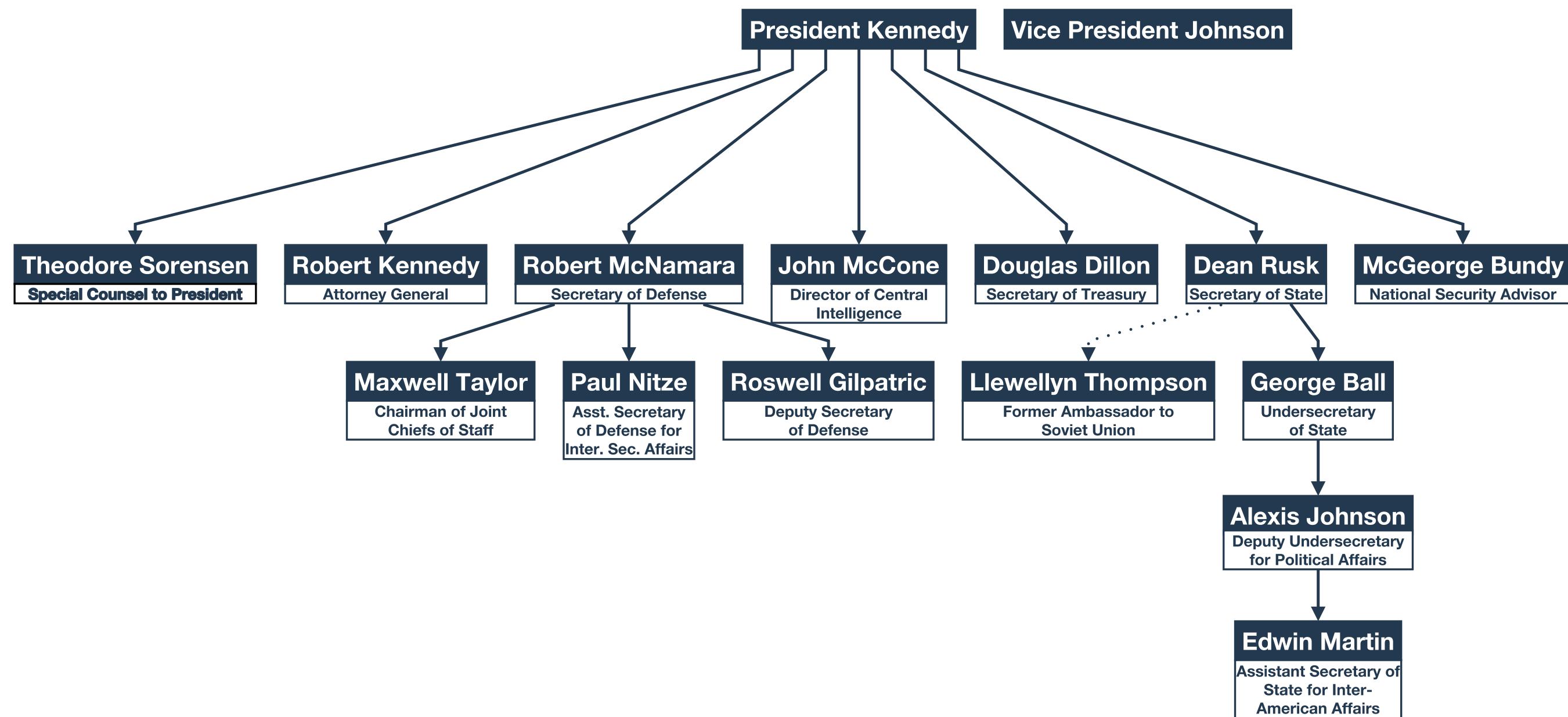
Results: global structure



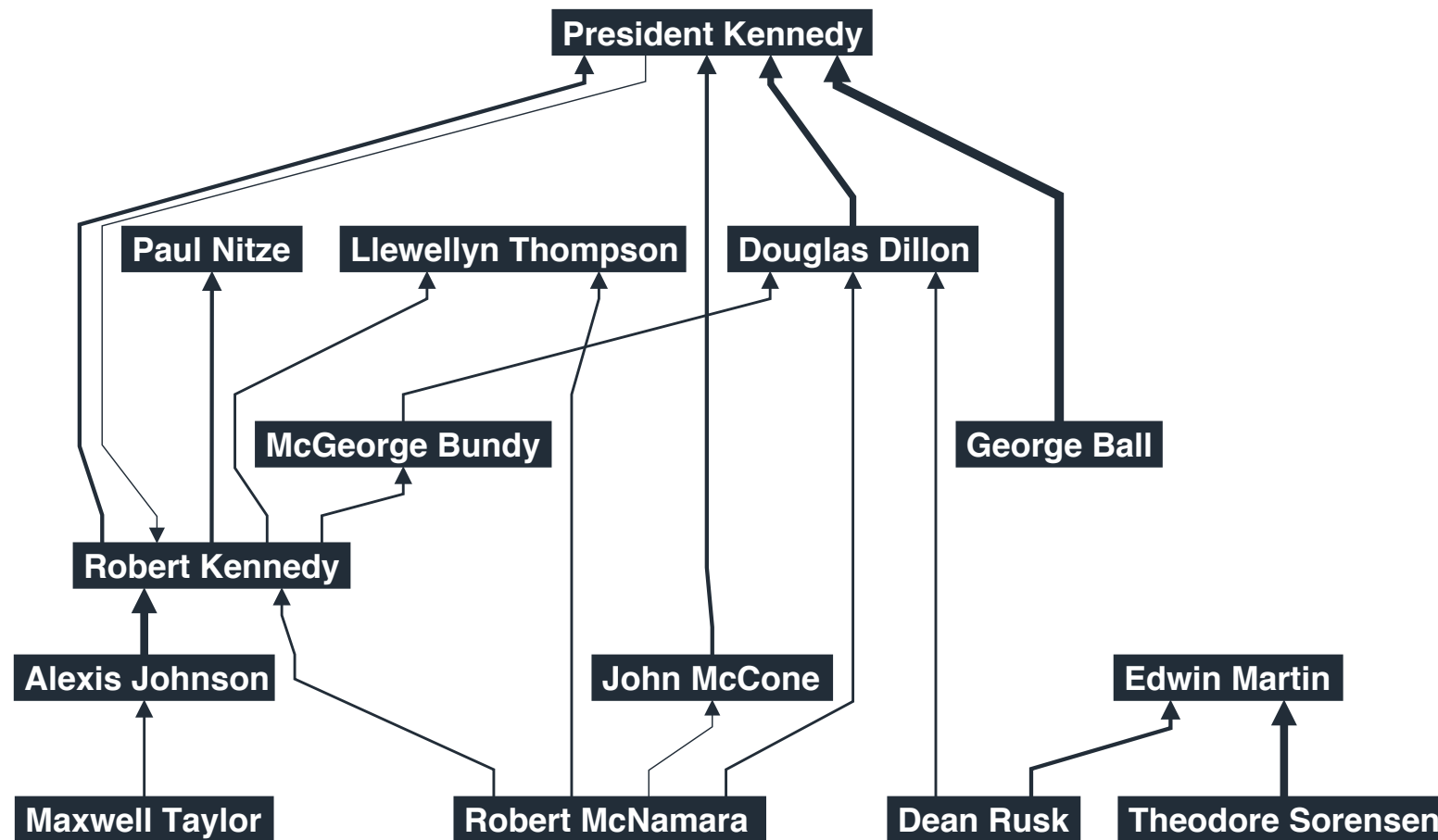
Results: global structure



Key ExComm membership



Results: global structure

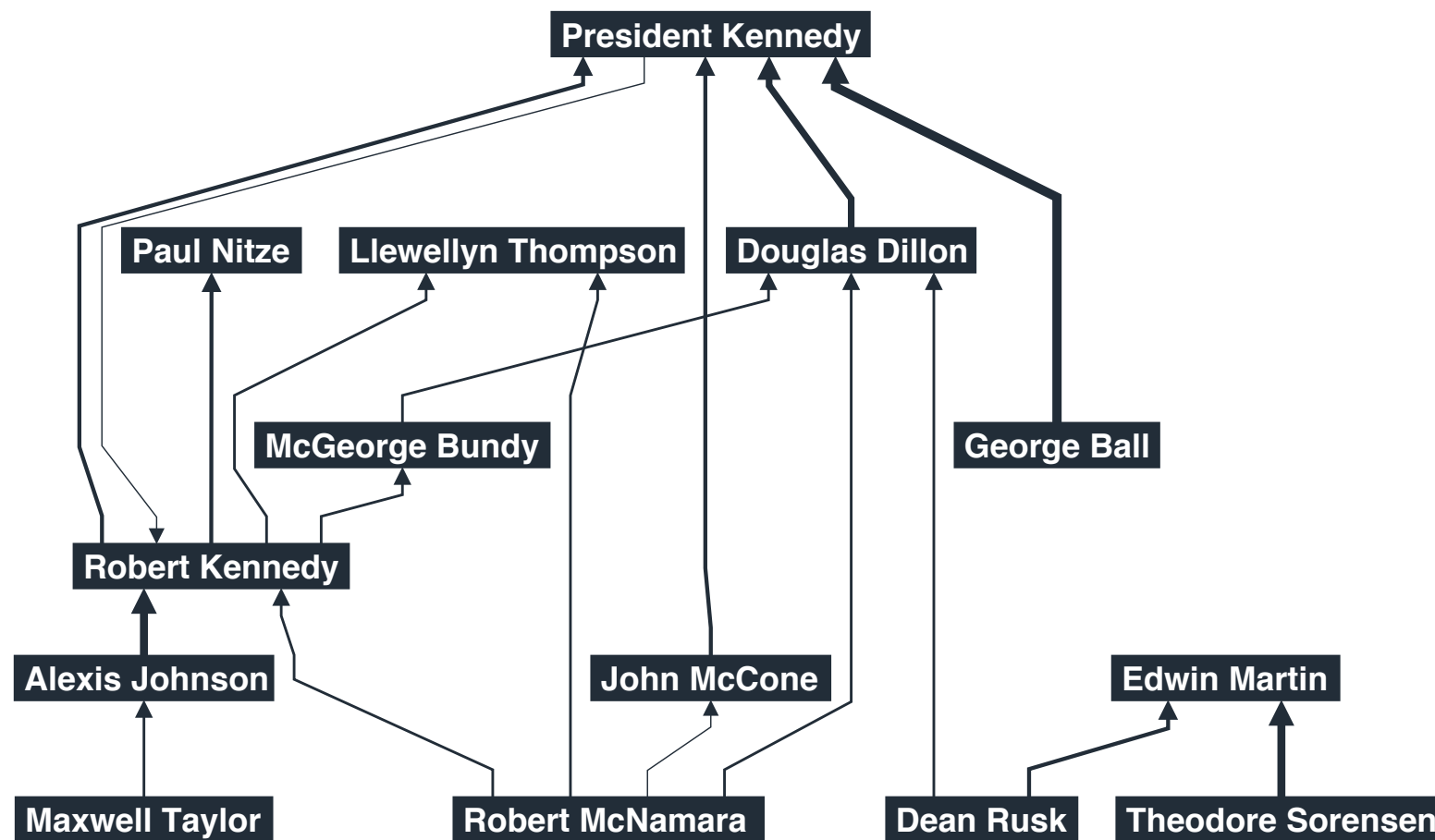


**Strict hierarchy
(one exception)**

Acyclic (DAG)

President at 'top'

Results: global structure



Strict hierarchy (one exception)

Acyclic (DAG)

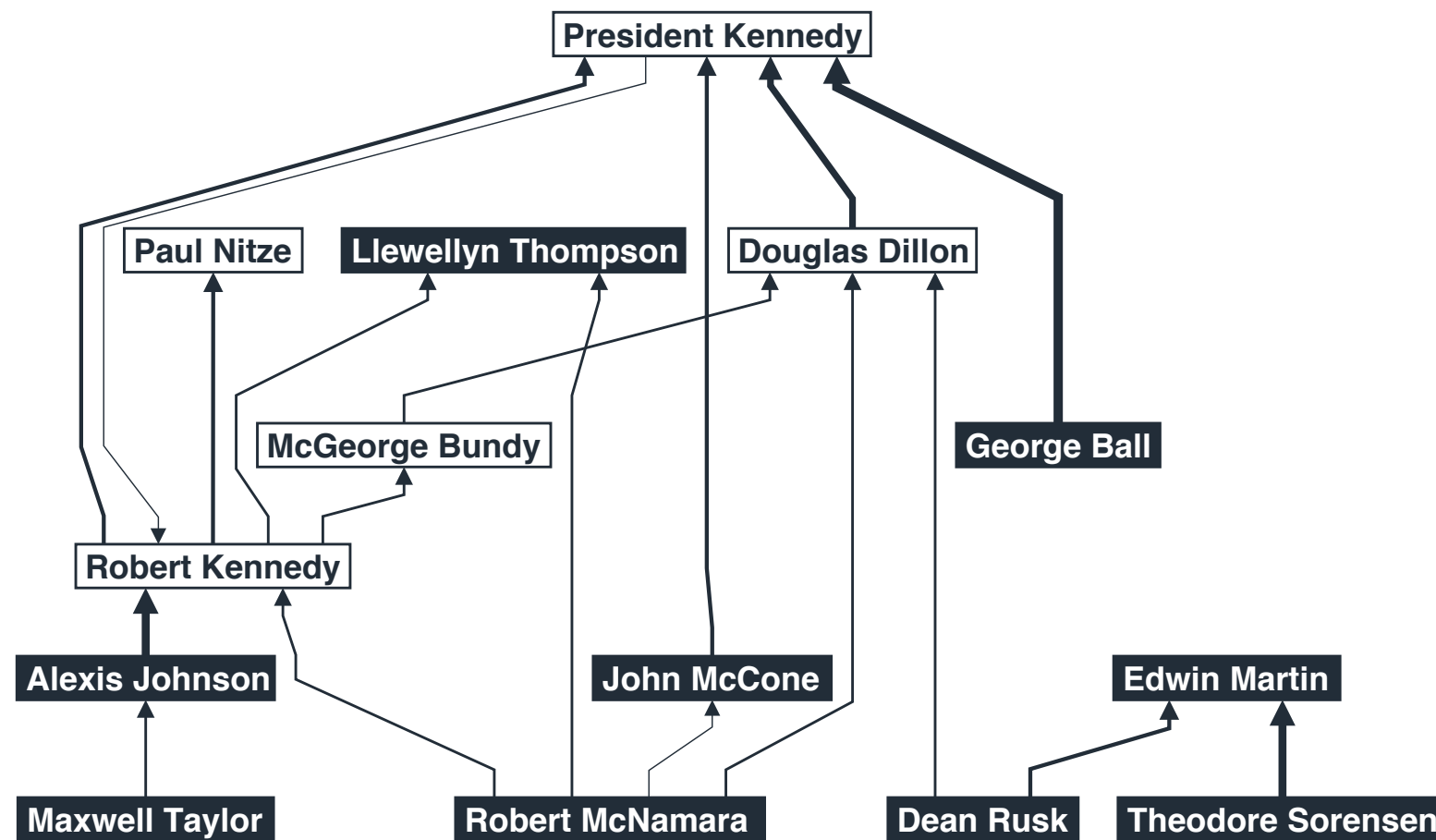
President at 'top'

Positions beyond 'high' versus 'low'

McNamara: embedded

Rusk: peripheral

Results: global structure



Strict hierarchy (one exception)

Acyclic (DAG)

President at 'top'

Positions beyond 'high' versus 'low'

McNamara: embedded

Rusk: peripheral

Reflects social class divides

Ivy-league education
strongly associated
with orientation

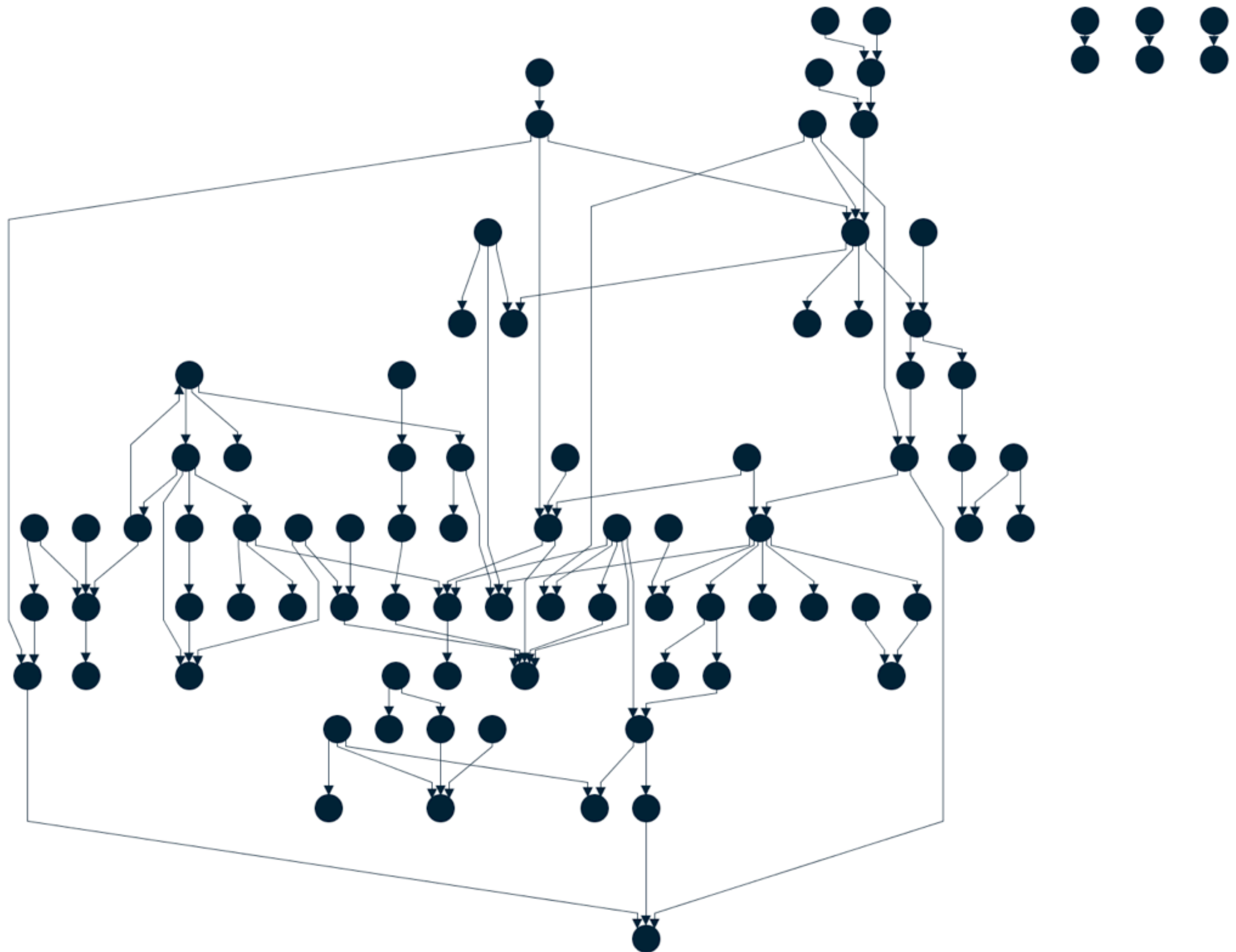
6. Related work

Reddit

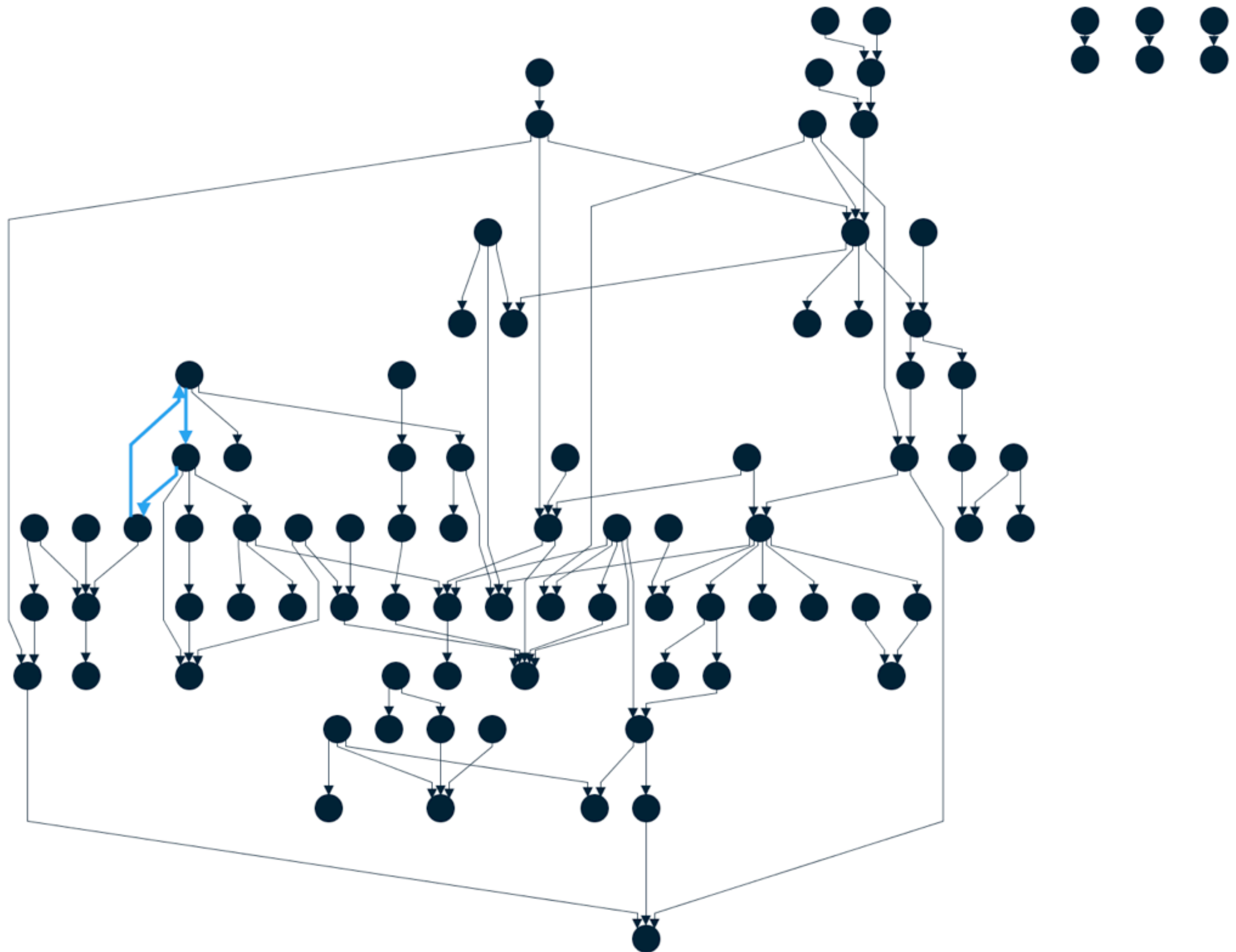
- Threaded, hierarchical discussions
- Plentiful data, no transcription barrier
- Narrow-channel (text-only interactions)
- Social media data often unreliable (sock puppets, copy-pasting, bots, anonymity, etc.)



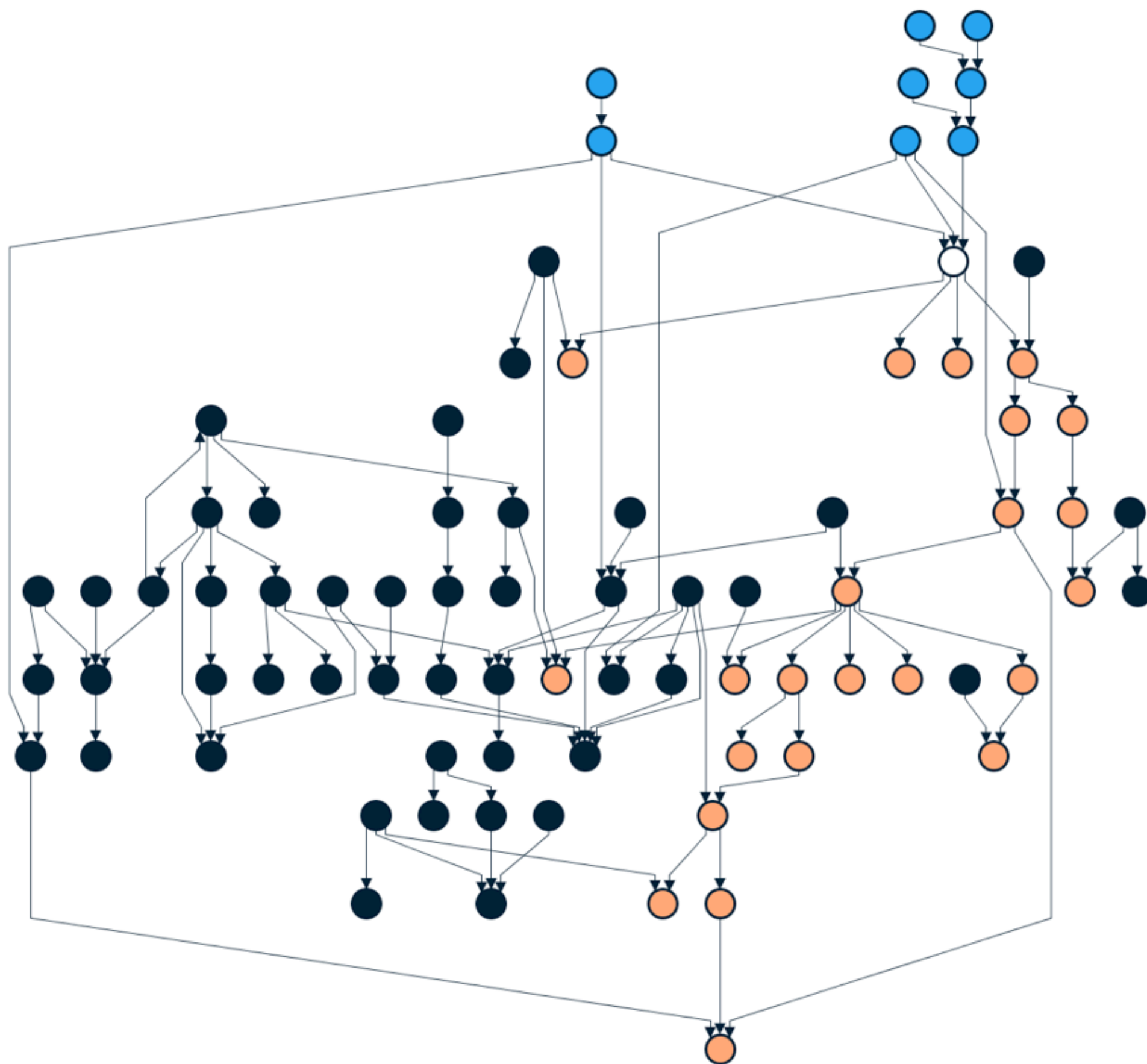
Online discourse



Online discourse



Online discourse



7. Discussion

Spoken language is not the whole picture

- Non-verbal interactions (body language, facial expressions, physical arrangement, ...)
- Non-human elements incorporated only indirectly (intelligence reports, military equipment, written messages, ...)

Conflation of statistical and situational uncertainty

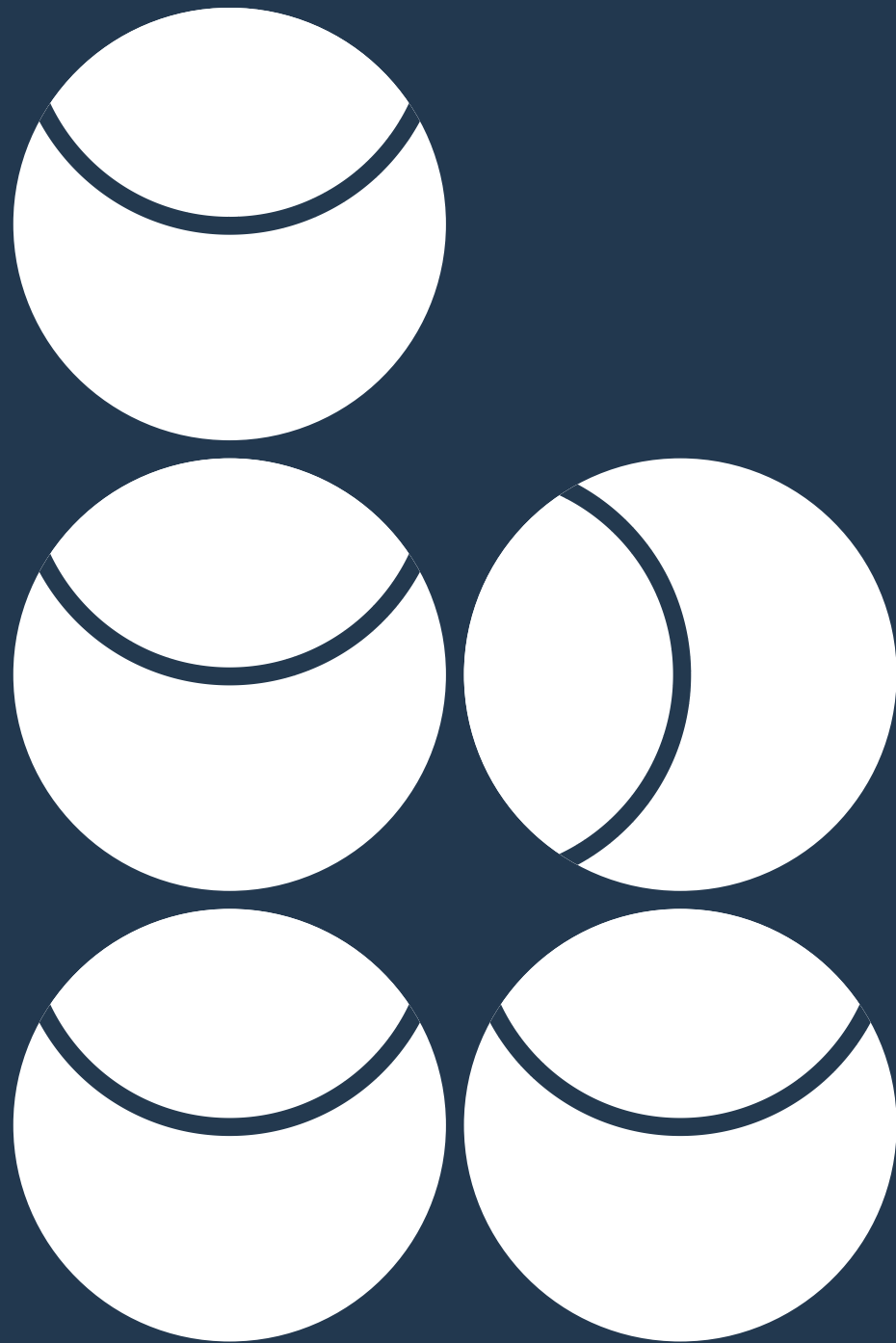
- ‘Holes’ in the structural picture could represent lack of interpersonal engagement *or* a lack of statistical power

Language reveals individuals' relations to group

- “Definition of the situation” at the intersubjective level
- Orientation of each participant to group as whole'

Hierarchical structure emergent from relational stances

- Discursive processes and group relational structure are co-constituted in the situation
- Hierarchy is an empirical outcome rather than assumption of model/theory

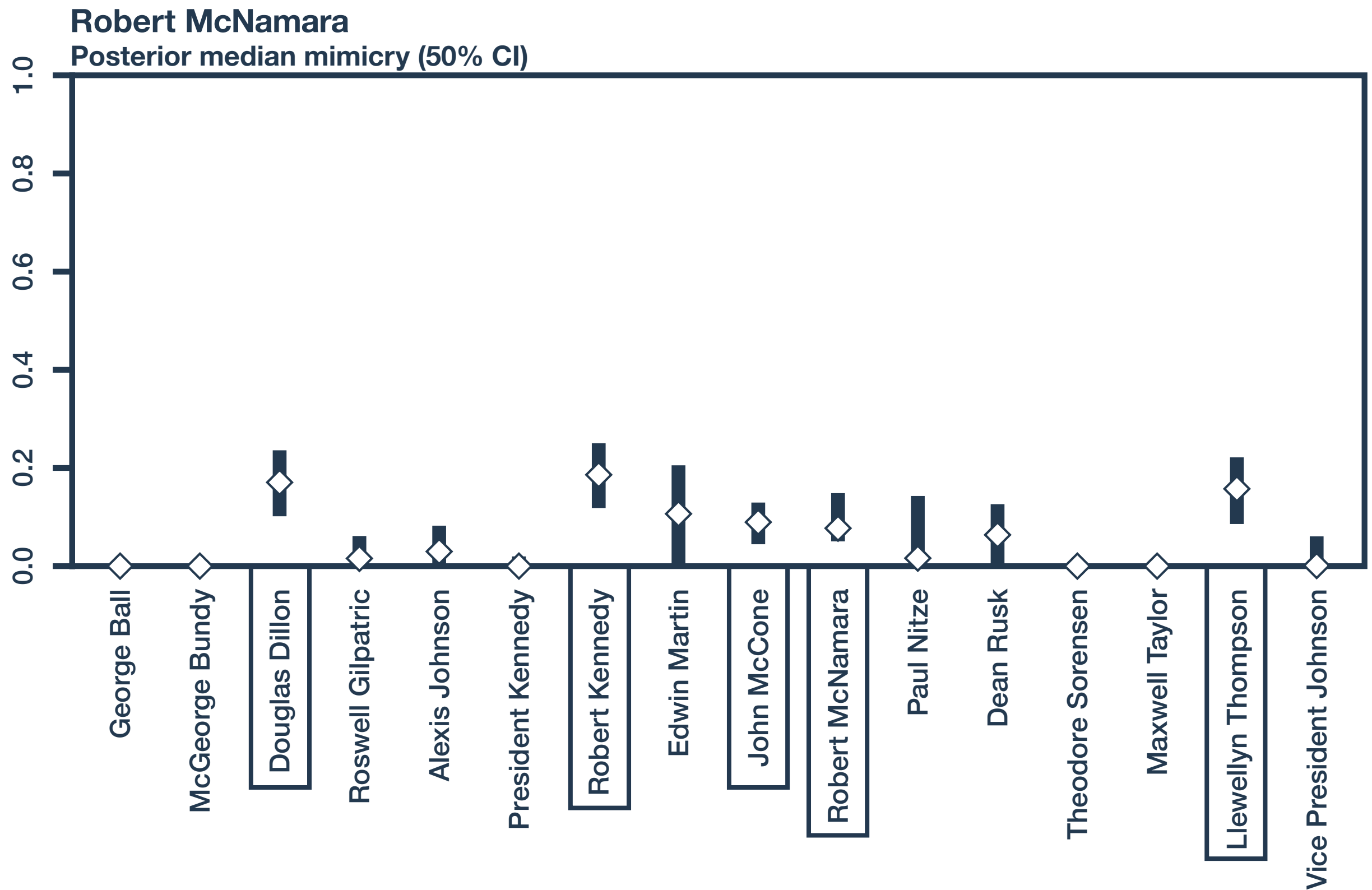


Thank you!

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Slides:
<https://kutt.it/socs19>

Results: individual orientation



Key ExComm membership

George Ball	Undersecretary of State	Northwestern
McGeorge Bundy	National Security Advisor	Yale
Douglas Dillon	Secretary of Treasury	Harvard
Roswell Gilpatric	Deputy Secretary of Defense	Yale
Alexis Johnson	Deputy Undersecretary for Political Affairs	Occidental College
Lyndon Johnson	Vice President	Southwest Texas State Teachers College
John F. Kennedy	President	Harvard
Robert Kennedy	Attorney General	Harvard
Edwin Martin	Assistant Secretary of State for Inter-American Affairs	Northwestern
John McCone	Director of Central Intelligence	Berkeley
Robert McNamara	Secretary of Defense	Berkeley
Paul Nitze	Assistant Secretary of Defense for International Security Affairs	Harvard
Dean Rusk	Secretary of State	Davidson College
Theodore Sorensen	Special counsel to president	University of Nebraska, Lincoln
Maxwell Taylor	Chair of the Joint Chiefs of Staff	Kansas City Polytechnic Institute / West Point
Llewellyn Thompson	Former ambassador to the Soviet Union	University of Colorado