

# Echoes of Power: Language Effects and Power Differences in Social Interaction

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Computational Content Analysis

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# Objective(s)

- Determine effects of power structure on dialogue
- Use computational linguistic analysis to assess power structures

Danescu-Niculescu-Mizil et al., 1

...[I]f we only have the text or transcripts of...interactions - the formats that online data often takes - how do we identify evidence of power differences?

- Tendency for people mimic choice of function-word classes made by interlocutors
- Assessed here using LIWC categories (e.g., articles, auxiliary verbs, conjunctions, etc.)
- Domain-general method of understanding power dynamics within an interaction

## Specifically:

- ① Generally, people with low power exhibit greater language coordination, and people with higher power are more coordinated-to
- ② A change in power status results in a commensurate change in coordination behavior
- ③ These findings are domain-general

## Wikipedia Edit Discussions

- Administrators
- Contributors
- **Written**

## Supreme Court Arguments

- Justices
- Lawyers
- **Spoken**

## Linguistic Coordination

Given speakers  $a, b$ , with utterances  $u_1 : a, u_2 : b$ , and linguistic category  $m$  :

$$C^m(b, a) = P(\varepsilon_{u_2 \leftrightarrow u_1}^m | \varepsilon_{u_1}^m) - P(\varepsilon_{u_2 \leftrightarrow u_1}^m)$$

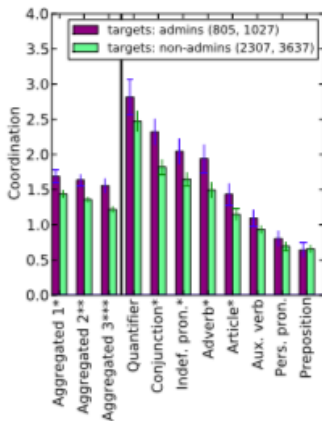
Simply, the likelihood that a speaker uses a linguistic category given that their interlocutor used that category, versus their baseline usage.

# Power Claims (again)

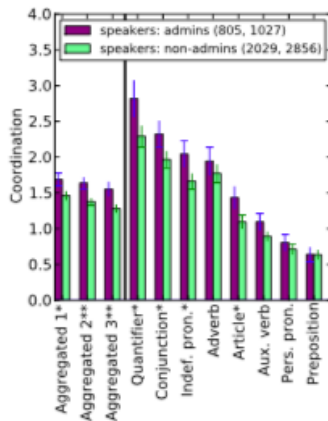
For a target group  $G$  and arbitrary group  $U$ :

- **Powerful Speaker(s):**  $C(G^{high}, U) < C(G^{low}, U)$
- **Powerful Listener(s):**  $C(U, G^{high}) > C(U, G^{low})$

# Wikipedia Results 1



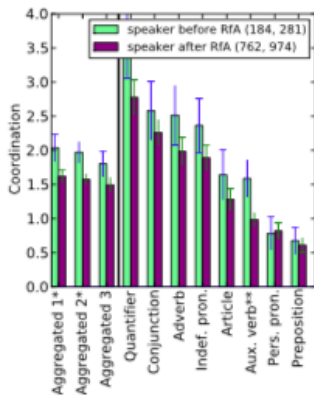
(a) Supporting  $\mathcal{P}_{target}$



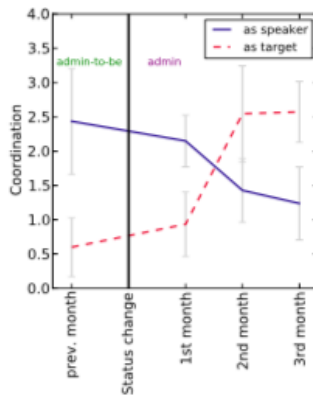
(b) Contradicting  $\mathcal{P}_{speaker}$



# Wikipedia Results 2

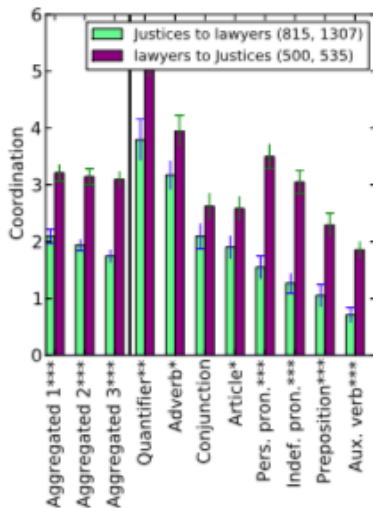


(a) Supporting  $\mathcal{P}'_{speaker}$

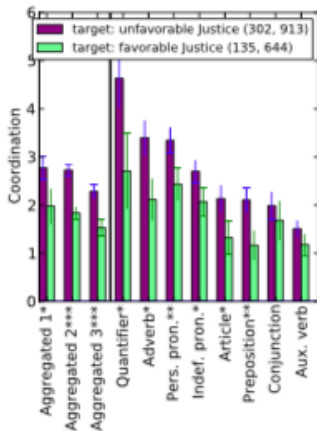


(b) Timed effect of status change ( $\mathcal{P}$ )

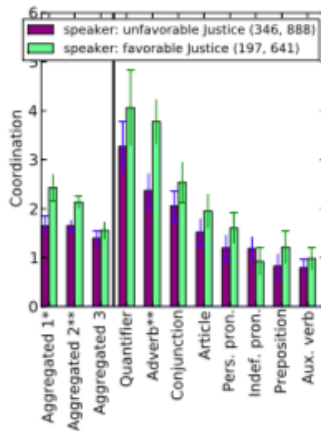
# Supreme Court Results 1



# Supreme Court Results 2



(a) Dependence:  $\mathcal{P}_{target}$



(b) Dependence:  $\mathcal{P}_{speaker}$

# SVM Prediction

Training corpus Test corpus	in-domain		cross-domain	
	<i>wiki</i>	<i>court</i>	<i>court</i>	<i>wiki</i>
	<i>wiki</i>	<i>court</i>	<i>wiki</i>	<i>court</i>
coordination features (9 altogether)	<b>57.7</b>	<b>70.4</b>	<b>57.1</b>	<b>55.0</b>
stylistic features (18 altogether)	<b>59.2</b>	51.4	50.0	51.9
bag of words (20,000 altogether)	51.4	<b>99.5</b>	45.2	40.1

Coordination features were only features that performed significantly above chance for cross-domain prediction.

# Brief Summary

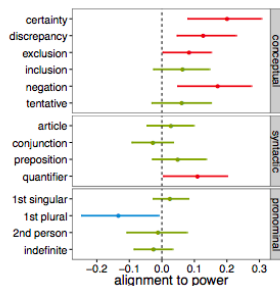
- The two power claims were supported:
  - Powerful speakers are more aligned-to
  - Powerful listeners do less aligning
- Changes in power produce different alignment behavior (after controlling for baselines)

## **What about other networks?**

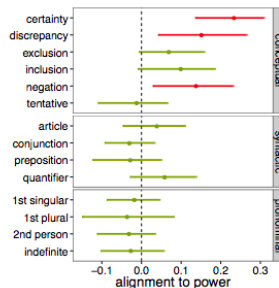
Do dispersed social networks (e.g., Facebook, Twitter) show similar linguistic markers of structural power?

# Twitter Alignment

## Power by Followers



## Power by Verification



Doyle, G., Yurovsky, D., Frank, M. C. (2016). A robust framework for estimating linguistic alignment in Twitter conversations. Proceedings of the 25th International Conference on World Wide Web, 637648.

## What constitutes a power relation?

Danescu-Niculescu-Mizil et al., 1

Our focus is on domains in which groups engage in goal-oriented discussions...An important characteristic of such discussions is that the participants are invested in the issues at hand, so that their dialogs are not simply idle chat.

- What is 'idle chat?' Why is it disqualified?



# Further Work

To evaluate whether power-based linguistic coordination, evaluate casual conversations *without* explicit goals/tasks/choices.

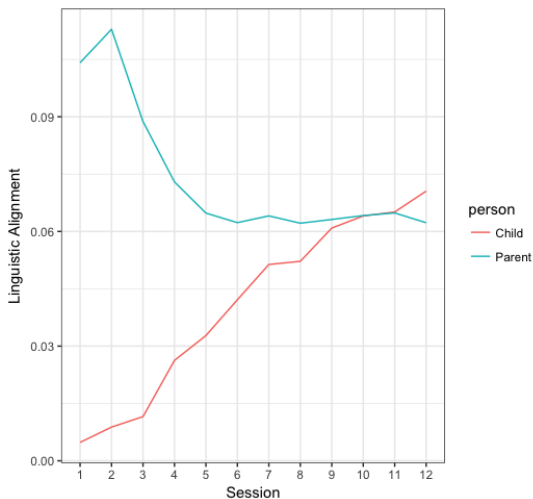
E.g., off-the-record conversations, water cooler talk, etc.

**What other purpose(s) does linguistic coordination serve?**

Is it always characterizable as evocative of power structure?

# Linguistic Alignment in Parent-Child Interactions

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## **What constitutes a power structure?**

Is it fair to characterize the parent-child dynamic as 'dependent?'