Telephone call mid-afternoon New Year's Day, 1967:

Somewhat uncertain female voice: "I have two questions. The first is sort of an etiquette one. I went to a New Year's Eve party and unexpectedly stayed over. I don't really know the hosts. Ought I to send a thank-you note? Second, when you meet a fellow and you know he's worth twenty-seven million dollars because that's what they told me, twenty-seven million, and you know his nationality, how do you find out his name?"

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(N.Y.P.L. archive)
Information systems – exhibit B

Google
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Non-conscious coordination

When conversing, people non-consciously adapt to one another’s communicative behaviors. [Giles et al., 1991; Chartrand and Bargh, 1999]
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Communicative behaviors are “**patterned and coordinated, like a dance**” [Niederhoffer and Pennebaker, 2002]
Linguistic style:

**How** things are said as opposed to **what** is said
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**Example:**

Client: “At what time does your shop close?”

Shopkeeper: “At five o’clock.”

Shopkeeper: “Five o’clock”
Linguistic style:

**How** things are said as opposed to **what** is said

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Linguistic style coordination

Linguistic style:

*How* things are said as opposed to *what* is said

Example:

Client: “At what time does your shop close?”

Client: “What time does your shop close?”

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[Levelt & Kelter, 1982]
Linguistic style:

**How** things are said as opposed to **what** is said

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[Levelt & Kelter, 1982]
Linguistic coordination occurs:
  - instantaneously
  - non-consciously
Linguistic style:
  for us: function word class usage

Coordination is not just exact matching:
  Client: “At what time does your shop close?”

  Shopkeeper: “In two hours.”
  Shopkeeper: “Five o’clock”
Measuring coordination
VINCENT: Antwan probably didn't expect Marsellus to react like he did, but he had to expect a reaction.
VINCENT: Antwan probably didn't expect Marsellus to react like he did, but he had to expect a reaction.

JULES: He just massaged her feet, massaging someone's feet is nothing, I massage my mother's feet.
Measuring coordination

JULES: It was a foot massage, a foot massage is nothing, I give my mother a foot massage.

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Matching on article presence.
Measuring coordination

VINCENT: Antwan probably didn't expect Marsellus to react like he did, but he had to expect a reaction.

JULES: It was a foot massage, a foot massage is nothing, I give my mother a foot massage.

Matching on article presence.
But matching ≠ coordination!
(e.g., chance or bad guys like articles)
Measuring coordination

What we want: how much Vincent’s inclusion of an article (say) immediately triggers the usage of articles in Jules’ reply?

NOT: how similar Vincent’s style is to Jules’ style in general ... or even in this particular conversation
Measuring coordination

What we want: how much Vincent’s inclusion of an article (say) immediately triggers the usage of articles in Jules’ reply?

Compare rate of article usage in Vincent’s and Jules’ utterances?
Measuring coordination

What we want: how much *Vincent’s* inclusion of an article (say) immediately triggers the usage of articles in *Jules’* reply?

Compare rate of article usage in *Vincent’s* and *Jules’* utterances?

not capturing *immediate* triggering
Measuring coordination

What we want: how much *Vincent’s* inclusion of an article (say) immediately triggers the usage of articles in *Jules*’ reply?

*Correlation of article usage?*
Measuring coordination

What we want: how much Vincent’s inclusion of an article (say) immediately triggers the usage of articles in Jules’ reply?

Correlation of article usage?

Symmetric, so not measuring a directed triggering effect
Measuring coordination

What we want: how much Vincent’s inclusion of an article (say) immediately triggers the usage of articles in Jules’ reply?

Coordination_{J \text{ to } V}(art.) = P(J_{\text{art.}} | J \text{ replied to } V, \text{Vart})
What we want: how much Vincent’s inclusion of an article (say) immediately triggers the usage of articles in Jules’ reply?

\[ \text{Coordination}_{(J \to V)}(\text{art.}) = \Pr(J_{\text{art.}} | J \text{ replied to } V, \text{art}) \]

does not control for style similarity
Measuring coordination

What we want: how much Vincent’s inclusion of an article (say) immediately triggers the usage of articles in Jules’ reply?

\[
\text{Coordination}_{(J \text{ to } V)}(\text{art.}) = \frac{P(J^{\text{art.}} | J \text{ replied to } V, V^{\text{art}})}{P(J^{\text{art.}} | J \text{ replied to } V)}
\]

Trigger
Control (for inherent similarity)
Measuring coordination

What we want: how much Vincent’s inclusion of an article (say) immediately triggers the usage of articles in Jules’ reply?

\[
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\]

In words: “How much does the probability of Jules using an article increase as a direct consequence of Vincent using an article”
Overall coordination: average over all pairs of users (B,A)

"Triggered" probability

Control probability

\[ P(B^{\text{art.}} \mid B \text{ replied to } A, A^{\text{art}}) \]

\[ P(B^{\text{art.}} \mid B \text{ replied to } A) \]
Coordination effect in social networks!

“Triggered” probability $P(B^{art.} | B\text{ replied to } A, A^{art})$

Control probability $P(B^{art.} | B\text{ replied to } A)$

$p$-value $< 0.0001$
Who’s got the upper hand?
RANDOM CORNER OF THE INTERNET
Coordination and power differences

Hypothesis: power differences are revealed by coordination behavior

Higher power $\rightarrow$ others coordinate more towards you
Hypothesis: power differences are revealed by coordination behavior

Higher power → others coordinate more towards you
→ you coordinate less toward others
Coordination and power differences

Two very different empirical settings:

Wikipedia community of editors:
- 240,000 conversational exchanges on “talk pages”
- users become **admins** through elections
Coordination and power differences

Two very different empirical settings:

Wikipedia community of editors:
- 240,000 conversational exchanges on “talk pages”
- users become admins through elections

U.S. Supreme Court oral arguments:
- 50,000 verbal exchanges
- between Justices and lawyers
Sources of power differences (from social exchange theory):

Status: $X$ has higher status than $Y \rightarrow X$ has power over $Y$
Coordination and power differences

Sources of power differences (from social exchange theory):

Status:  \( X \) has higher status than \( Y \)  \( \rightarrow \)  \( X \) has power over \( Y \)

Dependence:  \( Y \) needs something from \( X \)  \( \rightarrow \)  \( X \) has power over \( Y \)  
(at least temporarily)
Coordination and power differences

Sources of power differences (from social exchange theory):

Status: \( X \) has higher status than \( Y \) \( \Rightarrow \) \( X \) has power over \( Y \)

admins > non-admins (Wikipedia)
Sources of power differences (from social exchange theory):

Status: \( X \) has higher status than \( Y \) \( \rightarrow \) \( X \) has power over \( Y \)

- admins > non-admins (Wikipedia)
- Justices > lawyers (US Supreme Court)
Coordination and power differences

**Hypothesis:** Higher power $\rightarrow$ others coordinate more towards you

- Coordination towards high-power people (purple)
- Coordination towards low-power people (green)
Hypothesis: Higher power $\rightarrow$ others coordinate more towards you  

purple $>$ green ?

Coordination towards high-power people (purple)

Coordination towards low-power people (green)
Hypothesis: Higher power $\rightarrow$ others coordinate more towards you

purple $>$ green ?

Coordination towards high-power people (purple)

Coordination towards low-power people (green)
Coordination and power differences

Higher power (by status) → others coordinate more towards you

Wikipedia:

purple > green?
Coordination and power differences

Higher power (by status) \(\rightarrow\) others coordinate more towards you

Wikipedia:

Purple > green?
Coordination and power differences

Higher power (by status) $\rightarrow$ others coordinate more towards you

Supreme Court:

purple $>$ green?
Coordination and power differences

Sources of power differences (in our data):

Status

Dependence:  \( Y \) needs something from \( X \)  \( \rightarrow \)  \( X \) has power over  \( Y \)
Coordination and power differences

Sources of power differences (in our data):

Status

Dependence: Y needs something from X $\rightarrow$ X has power over Y

unfavorable Justice $>$ favorable Justice (Supreme Court)
Coordination and power differences

Higher power (by dependence) → other coordinate more towards you

Supreme Court:

purple > green?

(same in Wikipedia)
Coordination and power differences

Isolating the effect of power differences

Status change: non-admins are promoted to admins through elections
Track a fixed group of users as they undergo status change
Coordination and status change

Track a fixed group of users as they undergo status change

Coordination towards users increases after these gain higher status
Hypothesis: Higher power $\rightarrow$ you coordinate less towards others
Coordination and status change

Track a fixed group of users as they undergo status change

Coordination by users decreases after these gain higher status
Coordination and status change

Track a fixed group of users as they undergo status change

... even though initially “admins-to-be” were coordinating more than the average user.

Coordination by users decreases after these gain higher status