

Language and Human Nature

Steven Pinker

Dept. of Psychology

Harvard University

Darwin's Intellectual Legacy to the 21st Century

- Darwin:

- “In the distant future I see open fields for far more important researches. Psychology will be based on a new foundation....”
- “Man has an instinctive tendency to speak, as we see in the babble of our young children, whereas no child has an instinctive tendency to bake, brew, or write.”

Using Evolution to make Sense of Human Language

- First, basic question: Why did language evolve in *Homo sapiens* at all?
- Second, more complex, question: Why do people use language in the strange ways they do?

The Evolution of Language

- Basic idea (Pinker & Bloom, 1990):
- Language is an adaptation to the *cognitive niche*

“The Cognitive Niche” (John Tooby & Irv Devore)

- Organisms evolve at each other's expense.
- Co-evolutionary arms races
- Played out in evolutionary time

- “The cognitive niche”:
 - Humans overtake other organisms’ fixed defenses via
 - cause-effect reasoning
 - tools, traps, poisons, plant preparations, drugs, ...
 - cooperative action
 - Reciprocity, coordinated action (e.g., driving game)
 - Played out in *real* time, faster than other organisms can evolve defenses

Explains some Zoologically Unusual Features of *Homo sapiens*

(Unique or hyperdeveloped):

- 1. Technological know-how:
 - complex tool-making
 - plant & meat processing
 - medicinal drugs

- 2. Cooperation among non-kin
 - psychological adaptations for reciprocal altruism:
 - Recognition of individuals
 - Memory for past actions
 - Emotions of reciprocity (sympathy, gratitude, anger, guilt, trust)

- 3. Grammatical language:
 - Conveys who did what to whom; what is where
 - Allows people to:
 - Share expertise
 - Negotiate social contracts
 - Grammar is a combinatorial system
 - Number of sentences $\approx \# \text{ words}^{\text{length-of-sentence}}$
 - Language allows the sharing of a *vast* number of thoughts

Co-evolution of Language, Know-How, & Sociality

- Language: transmits structured information
- Crucial property of information:
 - Can be duplicated without loss
 - “Non-rival good”
- Language multiplies the benefit of know-how:
 - Lowers cost of acquisition (others’ trial-and-error, etc.)
 - Once acquired, useful to self not just to self but as a trade good
 - high benefit to others at low cost to self

Co-evolution of Language, Know-How, & Sociality cont.

- Language requires social cooperation
 - “To be on speaking terms”
- Language facilitates social cooperation:
 - Trade not just physical goods but favors
 - Trade not just now but at widely separated times
- Hypothesis: language, know-how, sociality were selection pressures for one another

- “Tower of Babel” thought experiment: what would human technological & social life be like *without* language?
- Language & a modern economy: telephones, publishing, internet, computers, radio ...
- Language is also indispensable in pre-state societies

A more challenging phenomenon:

- Why is language so often *not* used in an efficient way to communicate information and intentions?

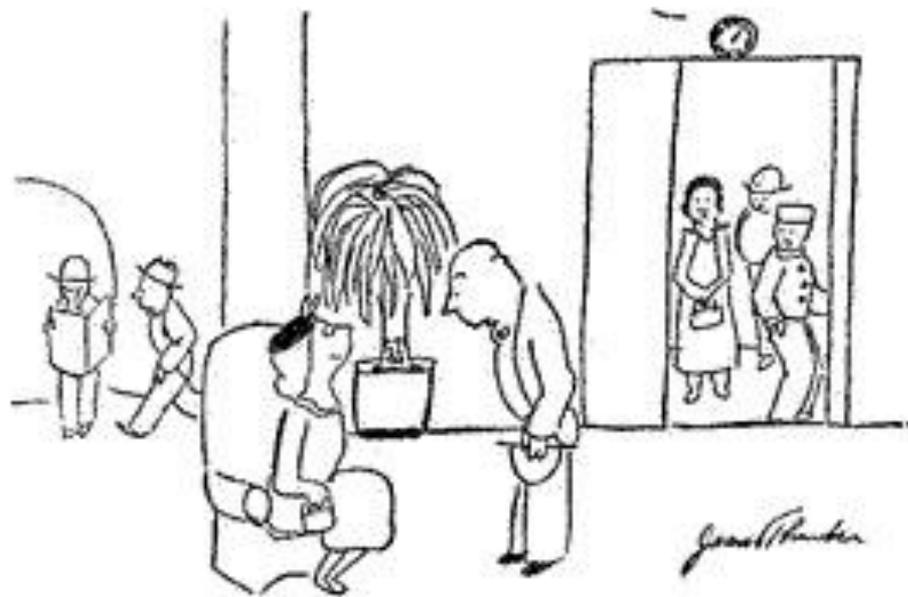
A Puzzle About Language



- “I was thinking that maybe the best thing would be to take care of it here in Brainerd.”

Some other indirect speech acts:

- “If you could pass the guacamole, that would be awesome.”
- “We’re counting on you to show leadership in our Campaign For the Future.”
- “Would you like to come up and see my etchings?”



"You wait here and I'll bring the etchings down."

Some other indirect speech acts:

- “If you could pass the guacamole, that would be awesome.”
- “We’re counting on you to show leadership in our Campaign For the Future.”
- “Would you like to come up and see my etchings?”
- “Nice store you got there. Would be a real shame if something happened to it.”

Indirect Speech Acts: A Puzzle

- Why are bribes, requests, seductions, solicitations, and threats so often *veiled*, when both parties know what they mean?

Limitations of Traditional (evolution-free) Analyses

- Grice: “Cooperative Principle”
 - speaker and hearer cooperate to advance the conversation
- Clark, *Using Language*:
 - “Language use is really a form of *joint action*. A joint action is one that is carried out by an ensemble of people acting in coordination with each other. As simple examples, think of two people waltzing, paddling a canoe, playing a piano duet, or making love.”

- Problems with cooperation theories:
 - Cooperative agents should use maximally efficient speech, not indirectness & euphemism
- Fundamental insight of evolutionary psychology (Trivers):
 - All social relationships involve mixtures of cooperation *and* conflict

- Cooperation/conflict ratio affects style of communication:
 - Pure cooperation:
 - conspiratorial whisper
 - Pure conflict:
 - shouting match
 - Elements of cooperation *and* conflict:
 - complex, coded communiqués

Practical Applications of Indirect Speech

- Practical importance:
 - Diplomacy
 - Extortion
 - Bribery
 - Sexual harassment
- All arenas of conflict!

A Solution in Three Parts:

1. The logic of plausible deniability
2. The logic of relationship negotiation
3. The logic of “mutual knowledge”

Part I: Plausible Deniability

- 1. “The Identification Problem” in game theory (T. Schelling)
- How do you figure out the rational course of action when the outcome depends on another intelligent agent, but you don't know the agent's values?
- Example: Bribing a police officer

Dishonest Officer

Honest Officer

Bribe:

Go free

Arrest for bribery

Don't Bribe:

Traffic ticket

Traffic ticket

	Dishonest Officer	Honest Officer
Bribe:	Go free	Arrest for bribery
Don't Bribe:	Traffic ticket	Traffic ticket

Dishonest Officer

Honest Officer

Veiled
Bribe:

Go free

Traffic ticket

Bribe:

Go free

Arrest for Bribery

Don't
Bribe:

Traffic ticket

Traffic ticket

Corrupt Officer

Honest Officer

Ambiguous
Bribe:

Go free

Traffic ticket

Bribe:

Go free

Arrest for Bribery

Don't
Bribe:

Traffic ticket

Traffic ticket

- Different payoffs with different hearers

+

- Different thresholds for those hearers

→

- Logic of “plausible deniability”

(Note role of conflict: Indirect speech used not to *help* honest officer attain his goal but to *confound* that goal)

Part II: Relationship Negotiation

- Why do people use indirect speech in *non-*legal situations, where there are no financial or legal payoffs & penalties?
- e.g., bribery in everyday life

TABLE TALK

Pocketful of Dough

You want to go to the hottest restaurant in town. You have no reservation.

Bruce Feiler has a plan for you

i AM NERVOUS, truly nervous. As the taxi bounces southward through the trendier neighborhoods of Manhattan—Flatiron, the Village, SoHo—I keep imagining the possible retorts of some incensed maitre d':

"What kind of establishment do you think this is?"

"How dare you insult me!"

"You think you can get in with *that*?"



each night. I would try to get a reservation by telephone that afternoon and go only if I were turned down. And I would carry a twenty and a fifty in my left pocket, and a hundred in my right pocket. I did have an incentive: I could eat at any place I could successfully finagle my way into.

Balthazar, on this night, does not look promising. A few people are lolling around

1. Extreme anxiety:

“I am nervous. Truly nervous. As the taxi bounces through the trendier neighborhoods of Manhattan, I keep imagining the possible retorts of some incensed maitre d’:

‘What kind of establishment do you think this is?’

‘How dare you insult me?’

‘Do you think you can get in with *that?*’”

2. Used of indirect speech:

– “I hope you can fit us in”

– “Can you speed up my wait?”

– “I was wondering if you might have a cancellation.”

3. Outcome ...

A Theory:

- Language has to do two things:
 - 1. convey content (e.g., bribe, command, proposition)
 - 2. negotiate & maintain relationship type

- Solution: Use language at two levels:
 - Literal form:
 - Speaker signals *safest* relationship to listener
 - Implicature (“reading between the lines”):
 - Speaker counts on listener to read between the lines to entertain a proposition that may be *incompatible* with that relationship

- A simple case: Politeness
- “If you could pass the guacamole, that would be awesome.”
 - Literal content makes no sense (irrelevant; overstatement)
 - Implicature: “The speaker is saying that an outcome of an action by me is good. Therefore he must be requesting it.”
 - Overall effect:
 - intended content = imperative
 - *but* without presumption of dominance

What Other Kinds of Relationships do People Negotiate?

- Dominance is one of *three* major types of human relationships (Alan Fiske)
- Each prescribes a distinct way of distributing resources
- Each has a distinct evolutionary basis
- Each applies most naturally to certain people (but can be extended to others)

Three Kinds of Relationships

1. Dominance

- “Don’t mess with me”
- Dominance hierarchies

2. Communality

- “What’s mine is thine, what’s thine is mine”
- Kin selection, mutualism (kin, spouse, close friends)

3. Reciprocity

- “You scratch my back; I’ll scratch yours”
- Reciprocal altruism

Major Hypothesis:

- Humans dynamically *switch* among the three major models of social interaction among organisms (dominance, nepotism/mutualism, reciprocity)
- But the three models are always *psychologically distinct*, and our social emotions – and use of language – reflects which one is agreed to be in force

- Behavior that is acceptable in one relationship type is anomalous in another:
 - help yourself to food (communality vs. dominance)
 - pay for meal (reciprocity vs. communality)

- When relationships are ambiguous, divergent understanding can be *costly* (“awkwardness”)
 - dominance or friendship? (workplace)
 - communality or reciprocity? (friends selling a car)
 - dominance or sex? (sexual harassment)
 - friendship or sex? (dating)

- *Social* identification problem
- Social costs of awkwardness (from mismatched relationship type) can duplicate payoff matrix of *legal* identification problem
- Example: bribing a maitre d' (authority vs. reciprocity)

Corrupt Maitre d'

Scrupulous Maitre d'

Bribe:

Quick table
(reciprocity/reciprocity)

Awkwardness
(reciprocity/dominance)

Don't
Bribe:

Long wait
(dominance/dominance)

Long wait
(dominance/dominance)

Corrupt Maitre d'

Scrupulous Maitre d'

Ambiguous
Bribe:

Quick table
(reciprocity/reciprocity)

Long wait
(dominance/dominance)

Bribe:

Quick table
(reciprocity/reciprocity)

Awkwardness
(reciprocity/dominance)

Don't
Bribe:

Long wait
(dominance/dominance)

Long wait
(dominance/dominance)

III. One Remaining Problem

- Why do people resort to indirect speech even when uncertainty is low or absent?
 - No Identification Problem because all listeners have the same values
 - Innuendo is so obvious that both parties *know* its intent exactly
- Any “deniability” is not really plausible
- Why should a transparent innuendo *still* feel less awkward than an overture that is “on the record”?

A NEW COMEDY BY ROB REINER

BILLY CRISTAL REG EVAN

Can
two friends
sleep
together
and
still love
each other
in the
morning?

When Harry Met Sally...

UNITED ARTISTS ENTERTAINMENT PRESENTS A UNIVERSAL PICTURES PRODUCTION A ROB REINER FILM BILLY CRISTAL REG EVAN
"WHEN HARRY MET SALLY..." CAROL PASTER ROBERT WAGNER "I MIGHT BE A KING" JIM BELUSHI
"THE UNDISCOVERED COUNTRY" JAMES BROWN "THE UNDISCOVERED COUNTRY" JAMES BROWN
CASTING BY JUDY GIBSON COSTUME DESIGNER JUDY GIBSON EXECUTIVE PRODUCERS JUDY GIBSON
PRODUCED BY JUDY GIBSON WRITTEN BY JUDY GIBSON DIRECTED BY ROB REINER

- Sally: You're coming on to me!
- Harry: What do you want me to do about it? I take it back, OK? I take it back.
- Sally: You can't take it back.
- Harry: Why not?
- Sally: Because it's already out there.
- Harry: Oh jeez. What are we supposed to do? Call the cops? It's already out there!

- What is the status of an overture that is:

- “out there”

- “on the record”

- “once said, can’t be unsaid”

that makes it worse than a veiled overture that is implicated indirectly?

Mutual Knowledge

- **Individual Knowledge versus Mutual Knowledge**
- Individual knowledge:
 - A knows x
 - B knows x
- Mutual knowledge:
 - A knows x
 - B knows x
 - A knows that B knows x
 - B knows that A knows x
 - A knows that B knows that A knows x
 -

- Mutual knowledge is qualitatively different from individual knowledge
 - Logical differences
 - Political rallies
 - The Super Bowl Ad effect
 - The Emperor's New Clothes
 - Note: Mutual knowledge licenses a change in relationship
 - Some adaptations for generating mutual knowledge:
 - eye contact
 - laughter
 - blushing
 - direct language

- A hypothesis on the role of mutual knowledge in language:
 - Direct speech is another generator of mutual knowledge
 - Innuendoes provide individual knowledge *without* mutual knowledge
 - Innuendoes allow information to be exchanged without changing the relationship model

- “Would you like to come up and see my etchings?”
 - Sally knows that she has turned down an overture.
 - Harry knows that she has turned down an overture.
 - BUT: Does Sally *know* that Harry knows?
 - Sally: “Maybe Harry thinks I’m naïve.”
 - AND: Does *Harry* know that Sally knows that he knows?
 - Harry: “Maybe Sally thinks I’m dense.”
 - No mutual knowledge
 - *Can* maintain the fiction of friendship

- “Would you like to come up and have sex?”
 - Harry knows that Sally knows that Harry knows that Sally knows ..
 - *Cannot* maintain the fiction of a friendship
 - “Can’t take it back. It’s out there.”

An Empirical Test (James Lee)

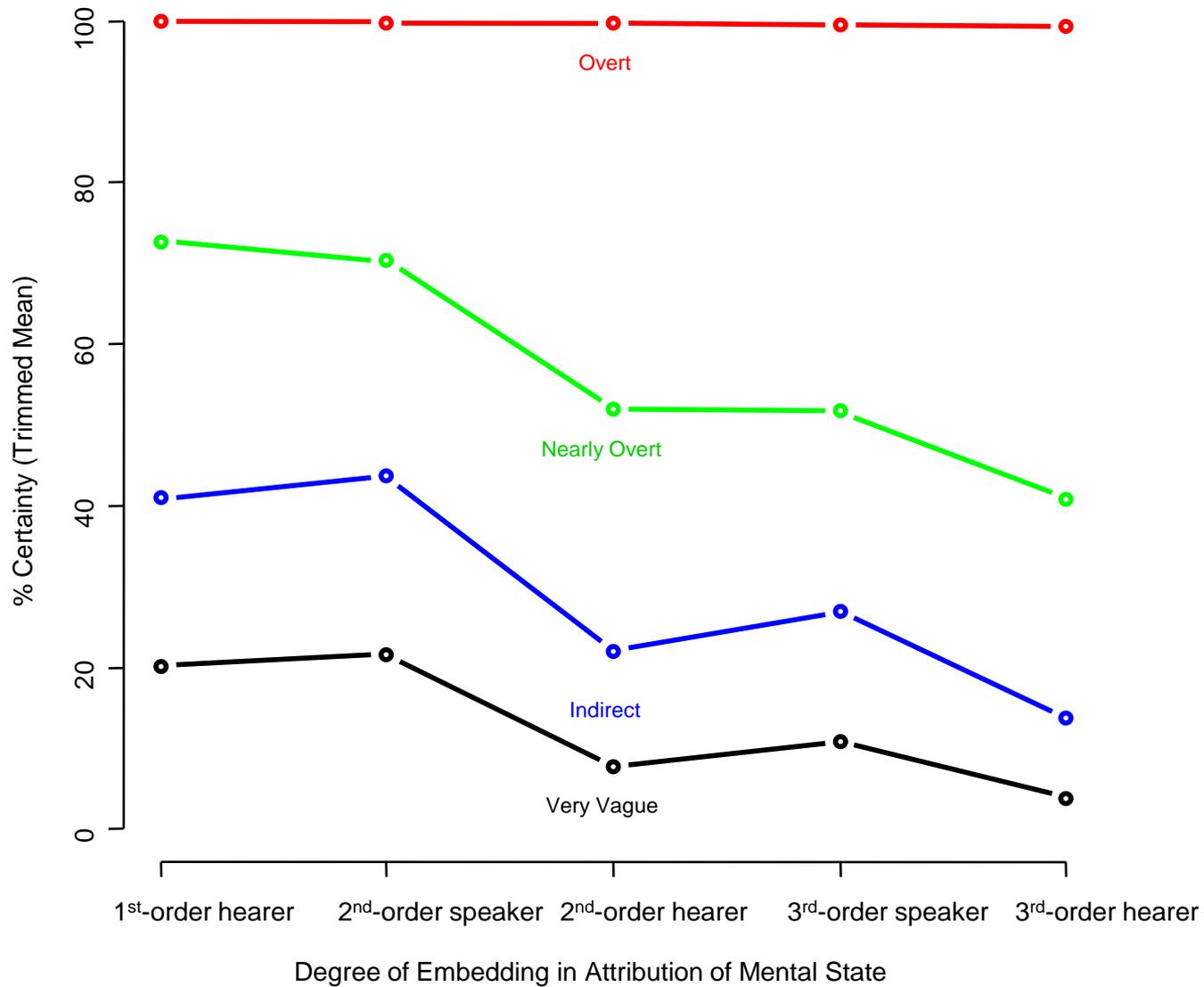
- [Michael and Lisa are coworkers & good friends. After dinner, Michael drives Lisa home. When passing his apartment, he says:]
 - "Wow. I feel like we've been talking about so much, but it's only ten-thirty."
 - "My friend just emailed me those pictures from our trip to Europe that I was telling you about. Do you want to come over and have a look?"
 - "You know, I have a really terrific view from my balcony. You can see the whole city, the lights, the ocean ... would you like to come over and have a look?"
 - "I find you really attractive, and I enjoyed being with you tonight a lot. Would you like to come over and have sex?"

Testing Mutual Knowledge

- [1st-order hearer]: Put yourself in Lisa's position. What is she thinking at this point?
 - “I'm *absolutely certain* that Michael was not asking me to have sex.”
 - “I'm *virtually certain*...”
 - “I *think* that he *probably* wasn't asking me...”
 - “*Did he* just ask me to have sex? Or was he just asking me to stay out longer?”
 - “I *think* he *probably* was asking me ...”
 - “I'm *virtually certain* he was asking me...”
 - “I'm *absolutely certain* he was...”

- [2nd-order speaker]: Lisa has politely said she wants to go home. Put yourself in Michael's position. What is he thinking?
 - “I'm absolutely certain that Lisa didn't understand that I was asking her for sex .”
 - ...
 - “I'm absolutely certain that she understood ...”
- [2nd-order hearer:] Lisa knows that Michael was asking her to have sex. Put yourself in her position. What is she thinking?
 - “Michael thinks that I didn't understand he was asking me to have sex. I'm absolutely certain of that.” ...
 - ...
 - “Michael knows that I understood that he was asking me to have sex. I'm absolutely certain of that.”

All Scenarios
Degree of Certainty of Mutual Knowledge:
"Hearer knows that speaker knows that hearer knows..."



Summary

- Language is an adaptation to the “cognitive niche”: facilitates exchange of information, negotiating of cooperation
- But: Indirect speech (polite requests, veiled threats & bribes, sexual overtures) are a puzzle for the theory that language is an adaptation for efficient communication

- Observation 1: Indirect speech can solve the Identification Problem in legal contexts (“plausible deniability”).
- Hypothesis: There are costs to mismatched relationship types, making everyday life similar to legal contexts.

- Hypothesis 2: Indirect speech is used even when deniability is not so plausible, because overt propositions generate *mutual knowledge*, whereas direct speech generates only *individual knowledge*, and mutual knowledge is necessary for changing a relationship model
- More generally: “Nothing in biology makes sense except in the light of evolution.”

- [3rd-order speaker:] Suppose that Michael *does* realize that Lisa knowingly turned down his invitation to have sex. Put yourself in Michael's position. What is he thinking?
 - “Lisa thinks that I didn't understand that she turned me down for sex. I'm absolutely certain of that .”
 - ...
 - “Lisa knows that I understood that she turned me down for sex. I'm absolutely certain of that.”
- [3rd-order hearer:] Suppose that Lisa *is* certain that Michael knows she turned down his invitation to have sex. Put yourself in Lisa's position. What is she thinking?
 - “Michael understands that I turned him down for sex. But he doesn't realize that I know he understands that.”
 - ...
 - “Michael understands that I turned him down for sex. And he realizes that I know he understands that.”