

What should be at the center?

Outstanding Challenges



1. Mimicking intelligence

Turing test, Chinese room argument

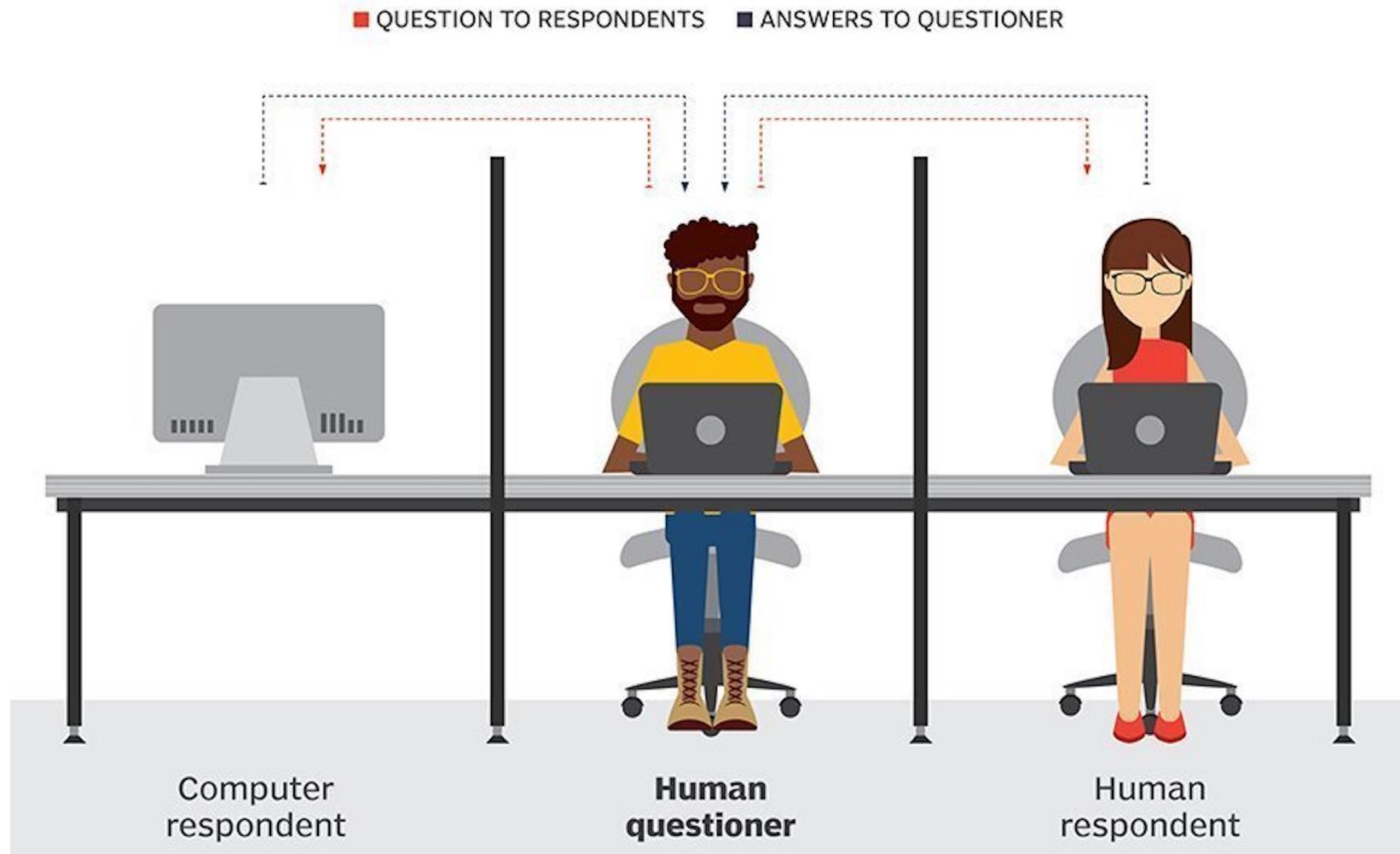
2. Conceptual challenges

Types vs. tokens, Ray-cat solution

3. Methodological challenges

Multi-layered signals

Turing test



A blind interview test of human-like intelligence

Chinese room argument



Executing a program does not equate understanding

1. Mimicking intelligence

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Types vs. tokens, Ray-cat solution

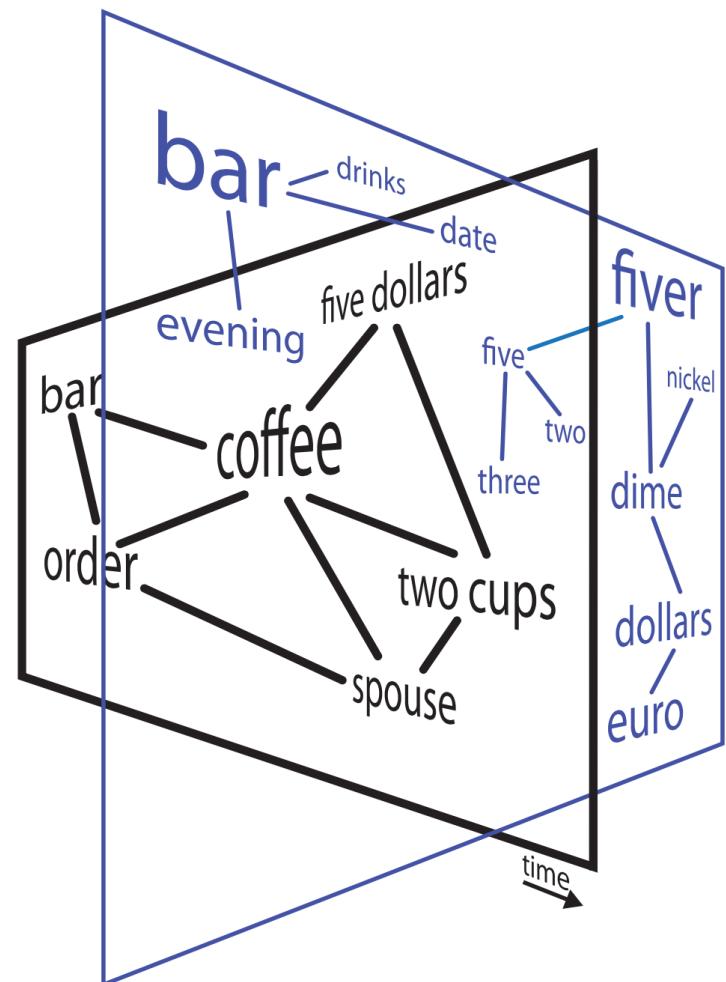
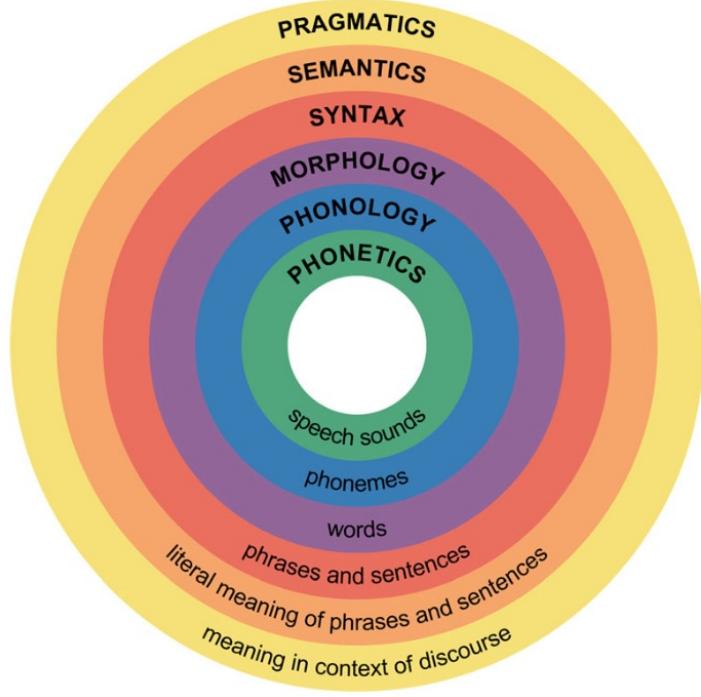
3. Methodological challenges

Multi-layered signals



Conceptual challenges

DARTMOUTH



Pragmatics and the aims of language evolution

Thomas C. Scott-Phillips^{1,2}

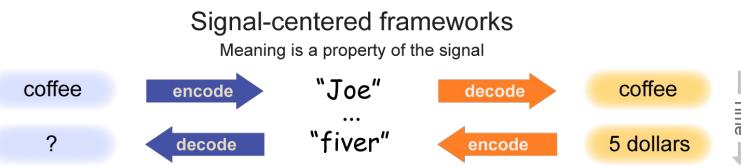
From linguistic types to contingently shared tokens



Types

Human communication as information transfer

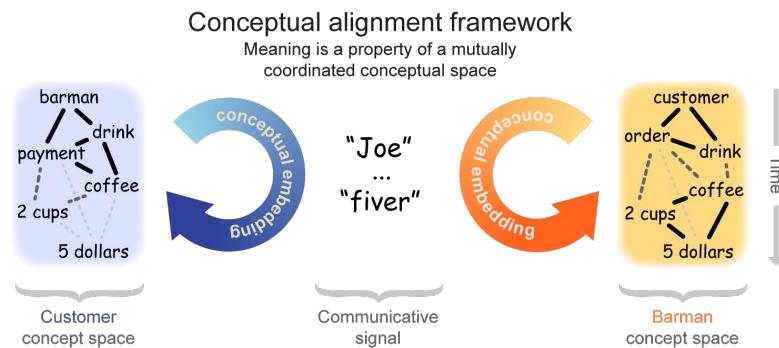
- Signals have *stereotyped* and *publicly invariant* consequences
- People (eventually) learn the same set of signals and referential mappings



Tokens

Human communication as intrinsically ambiguous

- Signals are referentially contingent on the *current circumstances*
- People (jointly) develop a situated source of interpretational constraints

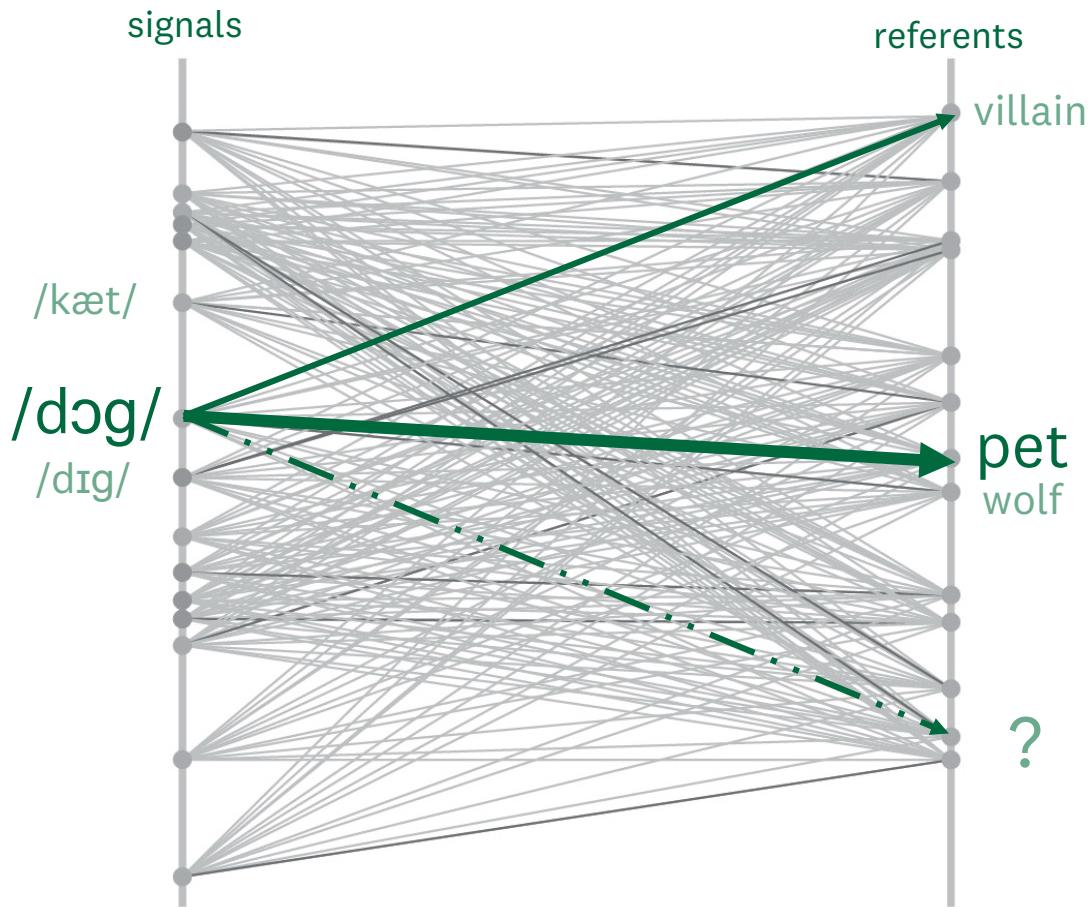


From linguistic types to contingently shared tokens



Signal-referent mappings

- Shannon (1948)
fixed mappings, shared between individuals
- Grice (1957)
deviations possible if you *mark them as such*
- Peirce (1931)
mappings are subject to *interpretation*



Ray-cat solution



Designing an intrinsically unambiguous message is hard, if not impossible

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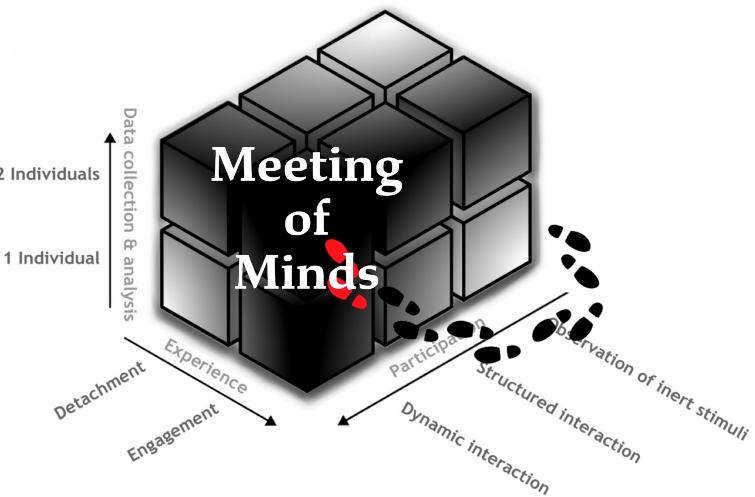
Multi-layered signals

Methodological challenges

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The “dark matter” of social neuroscience



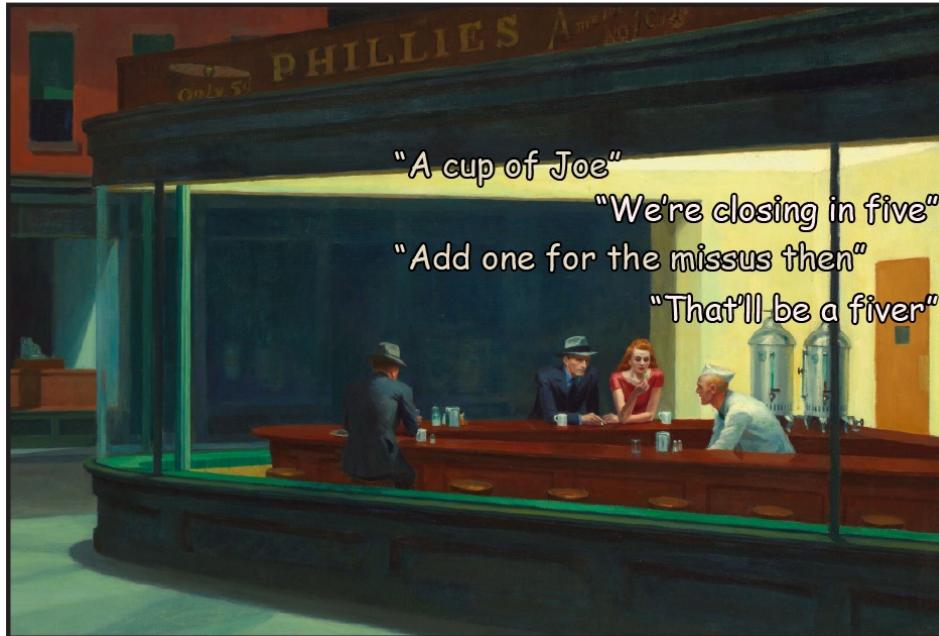
Adapted from Schilbach & Timmermans, 2013

From passive viewing to creating understanding within social interaction

- Words are defined only by their use, not their definition or meaning (Wittgenstein, 1953)
- A secret code that is written nowhere, known by none, and understood by all (Sapir, 1927)
- People use *multi-layered signals* as a tool to simultaneously probe, align, and shape their conceptual structures of the interaction ('joint epistemic engineering'):
 - Shannon-signal: targets common stereotyped associations
 - Grice-signal: marks its own communicative value
 - Peirce-signal: hints at its current contextual frame



Engineering a bar conversation

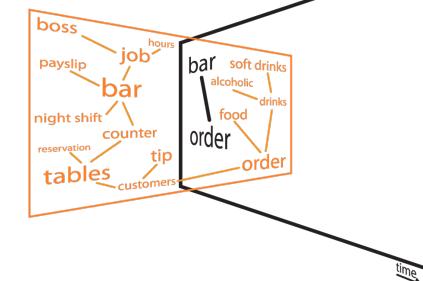
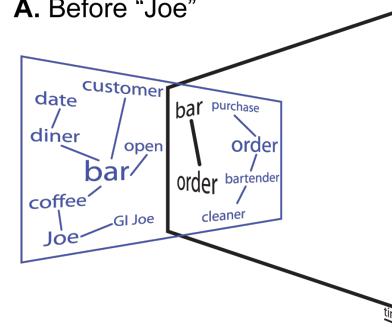


Even before voicing “A cup of Joe”, the customer would need to build a conceptual scaffold that approximates the scaffold presumably used by the bartender (black structures)

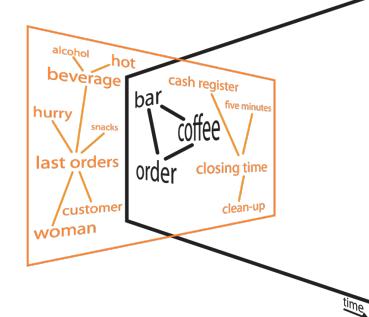
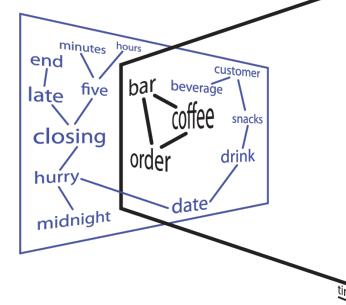
Besides placing an order (*a Shannon-signal*), the customer’s opening statement doubles as a tacit request to probe the conceptual scaffold shared with his interlocutor (*a Peirce-signal*), and to be recognized as such (*a Grice-signal*)

Besides conveying recognition of communicative intent (*a Grice-signal*) and additional details about the bar (*a Shannon-signal*), the bartender’s disclosure of the approaching closing time also operates as a tacit invitation to negotiate the customer’s current request or make another (*a Peirce-signal*)

A. Before “Joe”

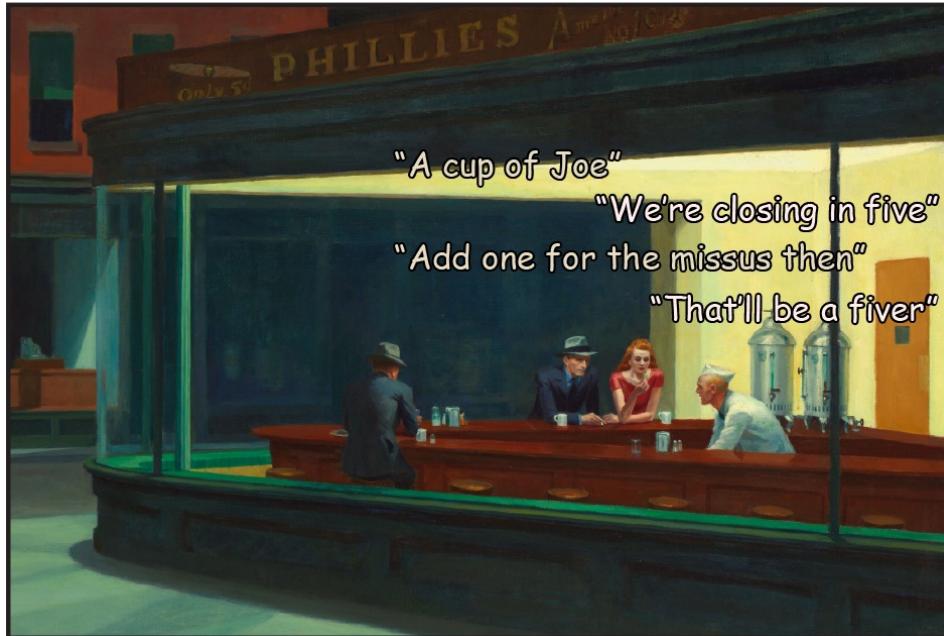


B. After “closing in five”





Engineering a bar conversation

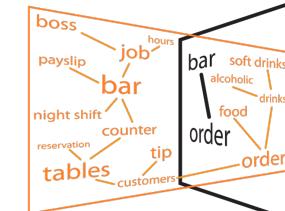
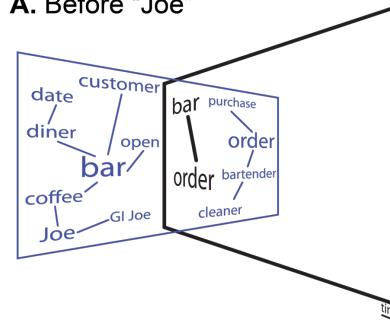


By considering background knowledge (blue/orange structures) in light of the current conceptual frame, interlocutors can reference a wealth of presumably shared or readily shareable semantic content for integration into their conceptual frame

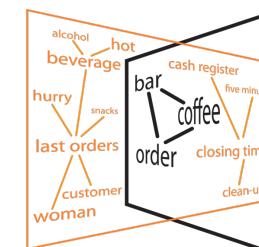
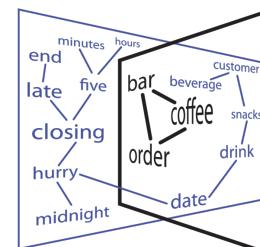
For instance, the bartender's "That'll be a fiver" references background knowledge (concept of payment) he expects his interlocutor to also consider in the context of their current conceptual frame. That reference would have been out of place in other moments of the exchange, e.g., before the customer's order

By exploiting their jointly assembled conceptual space, the interlocutors can even generate plausible hypotheses about novel signals, as when a customer hears "fiver" for the first time

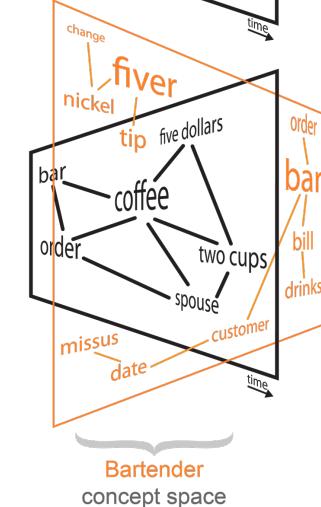
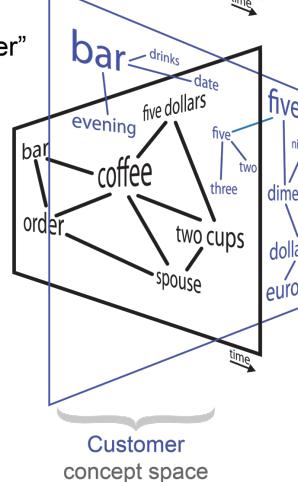
A. Before "Joe"



B. After "closing in five"



C. After "fiver"

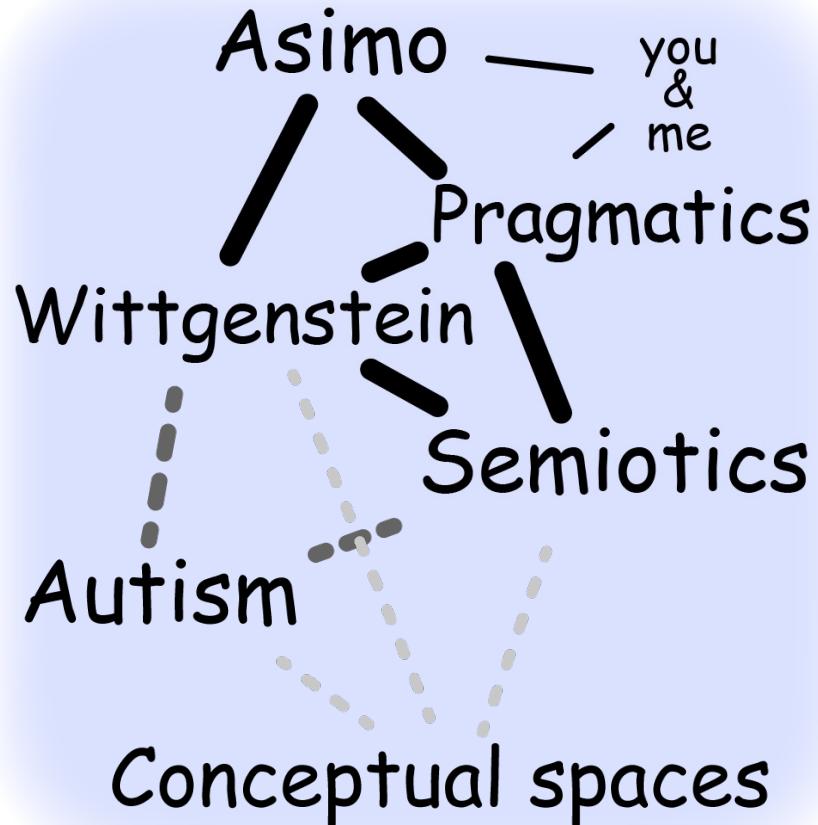


CONFUSING QUESTION of the DAY

*In light of Beyonce and Jay-Z's recent trip to Cuba,
do you support President Obama's new plan to
allocate 5% of federal tax dollars to fortify John
Kerry against South Koreans should Ahmadinejad
move forward with his nuclear program?*

People may forego repair of even critical misunderstandings

- A common language and its statistics do not explain how people communicate
- Signals are referentially contingent on the current communicative circumstances
- Communicators use multi-layered signals to jointly construct a shared conceptual space



Thank you for your alignment



Bonus: Job interview in the MRI scanner

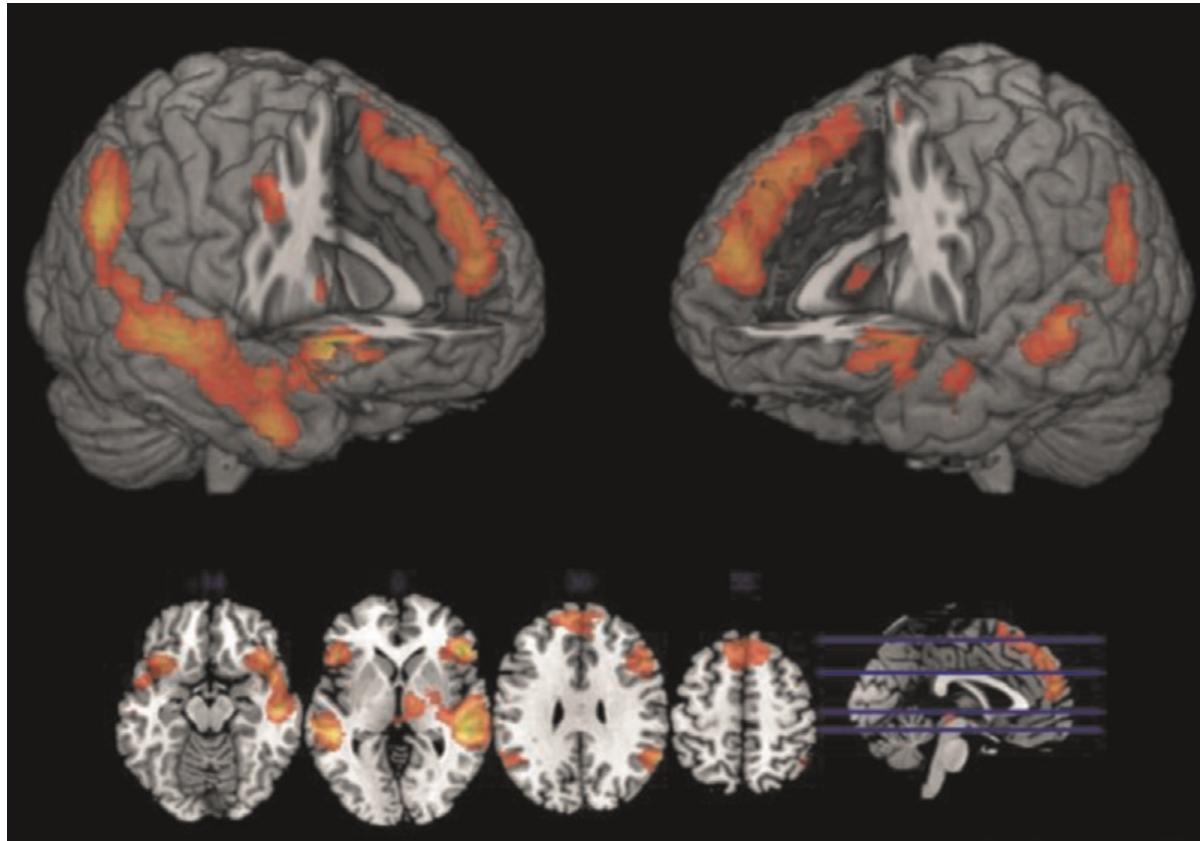
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Q: "Are you fluent in any foreign languages?"

R: "I am planning to take a language course this summer" (indirect reply)

Q: "What are your plans after graduation?"

R: "I am planning to take a language course this summer" (direct reply)



A job interview in the MRI scanner: How does indirectness affect addressees and overhearers?

Jana Bašnáková ^{a,b,*}, Jos van Berkum ^d, Kirsten Weber ^{a,e}, Peter Hagoort ^{a,c}

Face-saving indirect replies (Peirce-signals) recruit frontotemporal regions