(In)Formal pragmatics – Introduction

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Formalizing linguistic interactions

Language

- A fundamental component of most human activities.
- Conveying information, sending *messages*.
- Natural language has lots of aspects that needs understanding and formalization.

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- *Semantics* theorizes how a sentence is assigned *litteral* meaning.
- What's *meaning*? Most often, truth conditions, or inference patterns.
- Sometimes not determined by the sentence itself, sometimes too restricted a notion and needs to be *supplemented* by pragmatics.

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- What exactly is the meaning/effect of an imperative such as "Help me", how do we capture this?
- How do we capture the effects of disagreeing?

Some definitions of pragmatics

Morris [1938]

Semantics deals with the relation of signs to [...] objects which they may or do denote. Pragmatics concerns the relation of signs to their interpreters.

Stalnaker [1970]

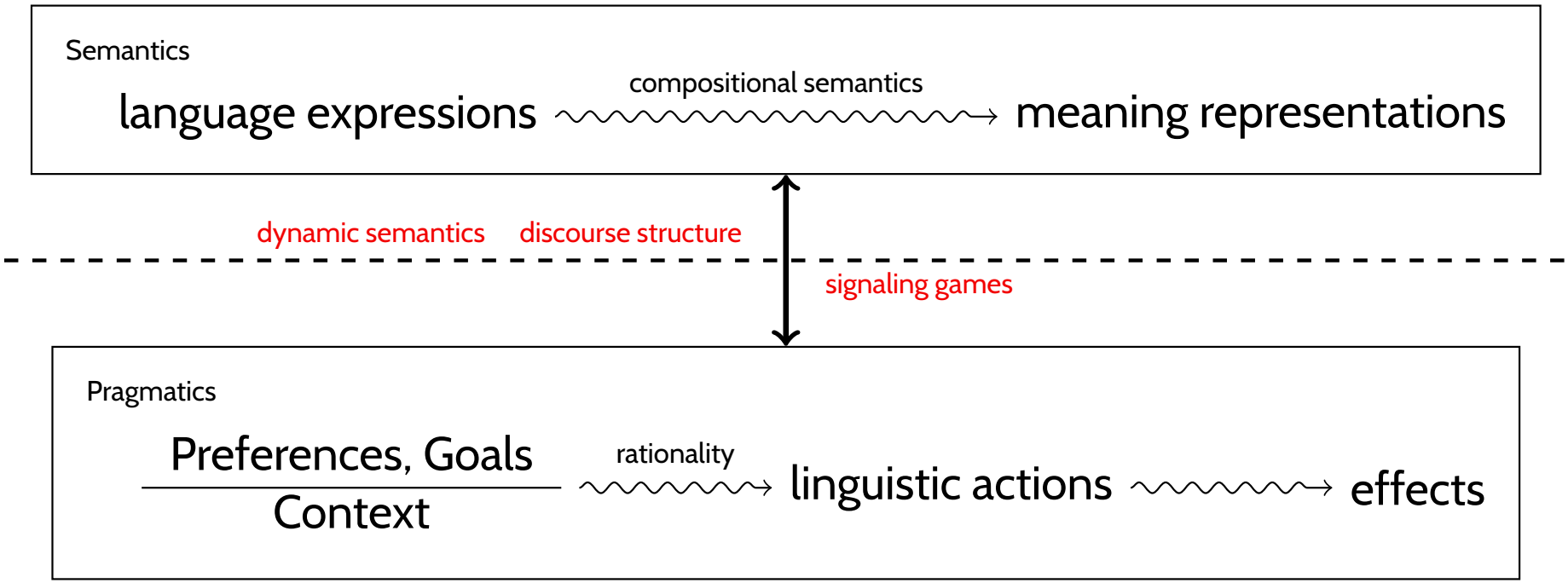
Syntax studies sentences, semantics studies propositions. Pragmatics is the study of linguistic acts and the contexts in which they are performed.

Asher, pc.

Semantics deals with the set of *possible* readings of a sentence. Pragmatics deals with the set of *preferred* readings of an utterance.

What needs formalizing?

Semantics/Pragmatics interface



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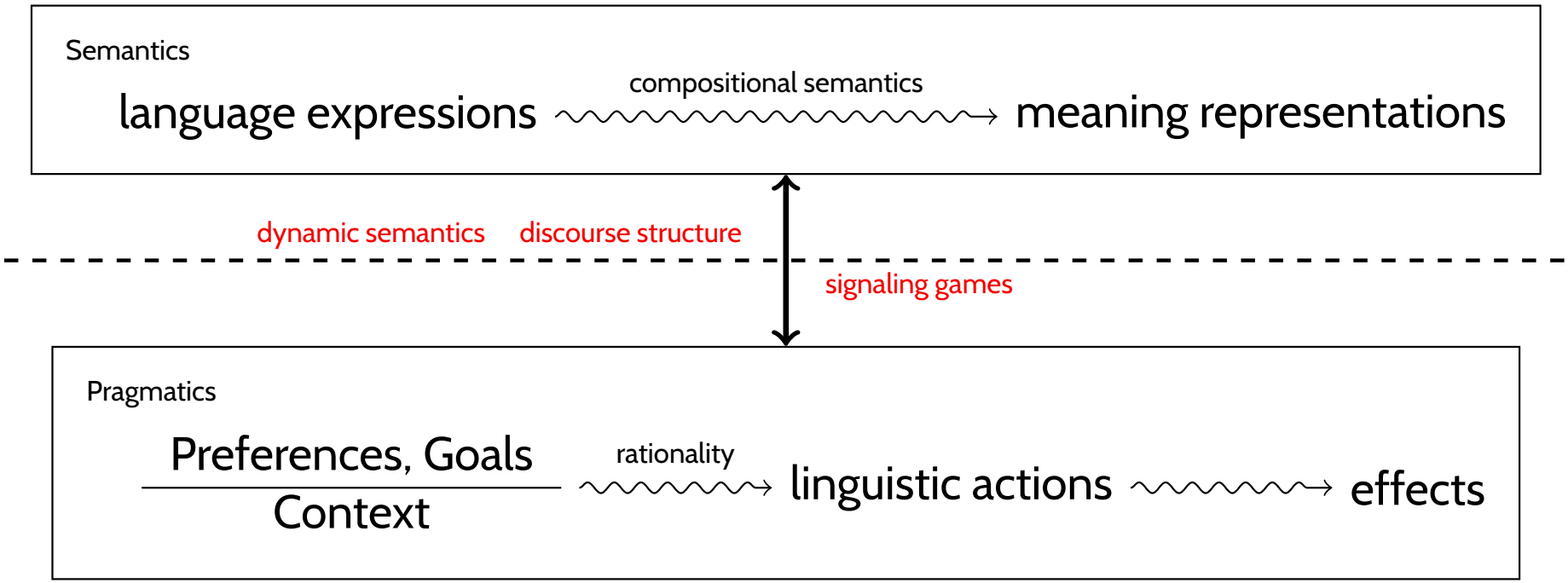

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- Logical structure, entailment

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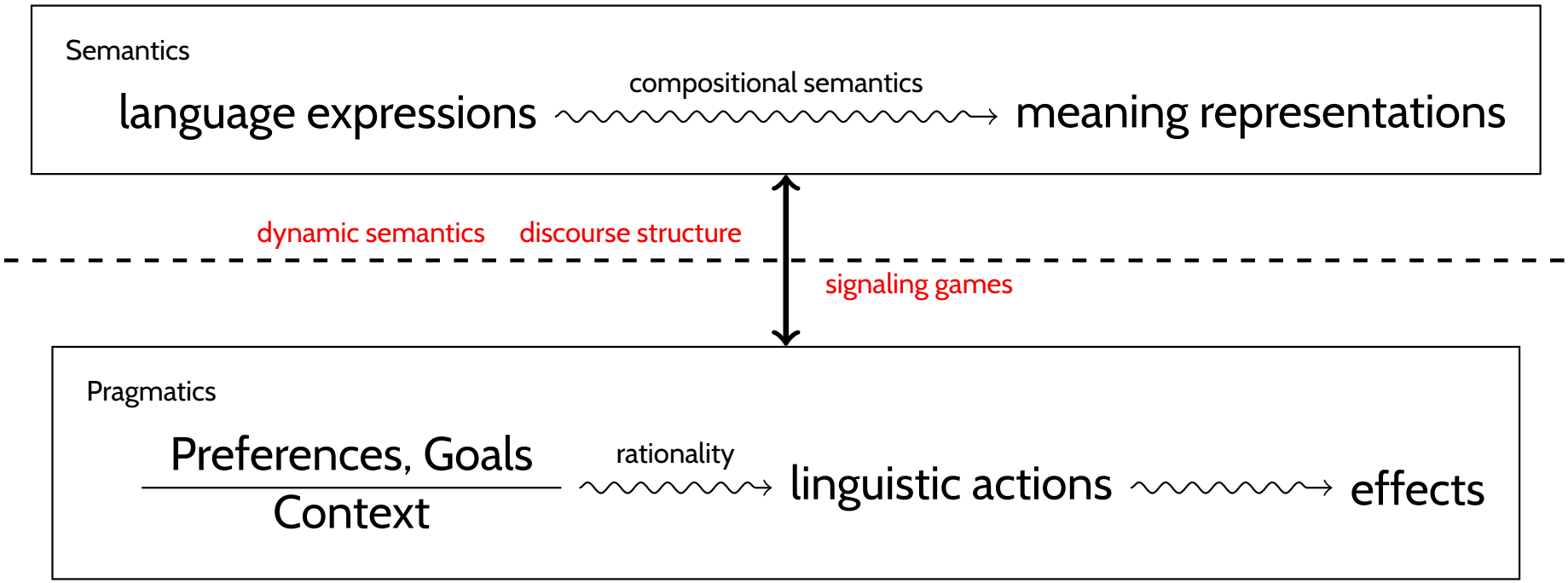

Aspects of the structure of linguistic objects

- Logical structure, entailment
- Rationality

Pragmatic phenomena

Indexicals

- 'I', 'you', 'now'.
- Demonstratives.

examples

- **I** think, therefore **I** am.
- He told me that he is **now** a philosopher.
- (Pointing at some food) It would never eat **this**!

Core component of formal accounts

- Meaning relativized to possible worlds **and** contexts (*double indexing*).
- Intensional logic (possible worlds).

Reference in discourse

Correference

- My neighbour thinks there is a witch around the corner. (#) she has a pointy hat.
- There is a witch. She has a pointy hat.
- It is not the case that there is no witch. (#) She has a pointy hat.
- There could be a witch. She would have a pointy hat.
- I went to the zoo yesterday. The monkeys are awesome.

Reference in discourse – contd

Propositional attitudes [Kaplan]

Context: Peter thinks the man in grey and Ortcutt are two different persons.

- Peter thinks the man in grey is Ortcutt.
- (?)Peter thinks Ortcutt is Ortcutt
- Peter thinks the man in grey is a spy.
- Peter thinks the shortest spy is a spy.
- There is someone of which Peter thinks that he is a spy.

More discourse

Temporal interpretation

- My girlfriend came home. I was cooking
- My girlfriend came home. I said ‘hi!’.

Presuppositions

- John takes his sword $\rightsquigarrow$ John has a sword.
- If John fences, John has a sword.
- John doesn’t take his sword $\rightsquigarrow$ John has a sword.

The first step: dynamic semantics

Meaning as context transformations:

Static semantics: propositions are true or false, given the actual state of the world.

Dynamic semantics: propositions transform an input context into an output contexts.

Dynamic semantics gives us the basic content of clauses to be supplemented by pragmatics and contextual inferences.

Implicatures

- A: Did all the student pass the test? B: Some of them passed the test.
  - $\rightsquigarrow$ not all of the student passed.
  - $\rightsquigarrow$ speaker dosn't know whether all the student passed.
- Cheese or dessert for 5 euros $\rightsquigarrow$ only one of the two for 5 euros.

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a) A: Will you come to the party tonight?

b) B: I have to work.

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defasibility

a) A: Will you come to the party tonight?

b) B: I have to work.

c) B: In fact, I should be done by tonight, so yes.

Gricean pragmatics

- Conversation is a *rational* activity
- Implicatures are a byproduct of rationality.
- Grice's modified Ockham's razor: "Do not multiply senses beyond necessity".
- Inference is guided using *maxims* that governs rational conversationalists:

Cooperativity Principle [Grice]

Make your contribution such as it is required, at the stage at which it occurs, by the accepted purpose or direction of the talk exchange in which you are engaged.

Some Gricean maxims:

Quality Do not say what you believe is false.

Quantity Make your contribution as informative as is required[…].

An example of Gricean reasoning

Indirect Answer

A: Have you eaten all of my cookies?

B: I didn't even know you had cookies.

Inference Pattern

- A expresses an intention to know whether *p*
- By sincerity *A* intends to know whether *p*
- By the cooperativity principle, *B* intends *A* to know whether *p*.
- There are more informative *alternatives* to *B*'s answer ('yes', 'no').
- It must be than ressorting to these answer must have violated other maxims, resp. competence and quantity.
- *B*'s answer is to be interpreted as a more informative *no*.

Making things formal

Formal Gricean theories

- Not formal → hard to evaluate their predictive power.
- Nor are sets of "alternatives"
- There is no precise and unambiguous way to reason with them.

Formal Gricean approaches

- Formalizing the maxims (or parts or modified versions of them) in a logical language.
- Use that language for inference.
- Problem: The basis for inference is that some maxim is violated, for contextual reason.
- Cannot formalize such exceptional violation in classical (monotonic) logic → **Default (nonmonotonic) logics**.
- Other successful program: game-theoretic pragmatics.

Discourse Structure : all in one

A theoretical common place to see a discourse or dialogue as a structured object:

- **Elementary units** (EDUs), each one roughly corresponding to a clause (one eventuality involved).
- **Discourse relations** such as Explanation, Result, Elaboration, and so on, linking different EDUs, model **coherence**.
- Relations bring consequences supplementing the meaning of their arguments.

Structure guides inferences:

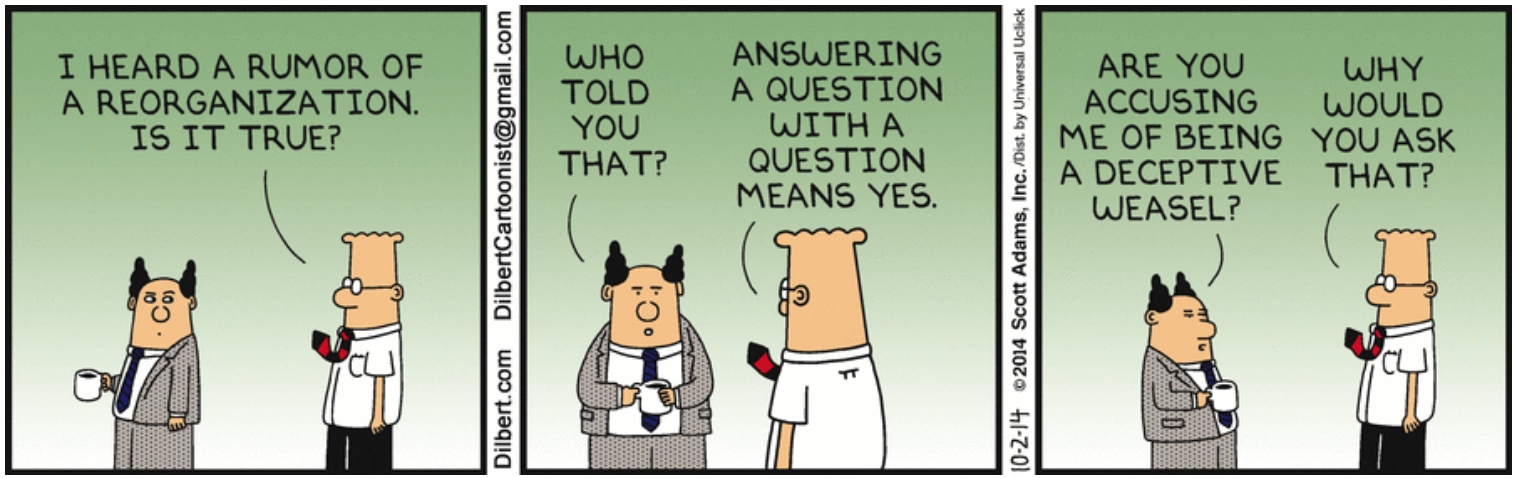
- $[\textit{Do you want to meet now?}]_a$ –$[\textit{I'm tired}]_b$
  $\rightsquigarrow$ Indirect question-answer pair, $\mathit{IQAP}(a, b)$.
- $[\textit{Do you like this girl?}]_a$ –$[\textit{I'm tired}]_b$. $\rightsquigarrow$ Unresponsiveness (and justification thereof: *Explanation*([I don't want to anwer], [*I'm tired*])).

Commitments: relating speakers to meanings.

The meaning of saying something

- There are several participants to a conversation.
- Saying something does not make it true. Neither does it *commits* others to its truth.
- Participants need not agree. Not even on the content of what was said.
- Need to relate contents to speakers $\rightsquigarrow$ commitments.
- E.g., when one asserts an indicative sentence, one commits to its meaning, vouches for its truth.
- Commitments, as opposed to beliefs are overtly accessible, public.
- Commitments interact in a complex way.

Examples



Discursive ambiguity:

C: N. isn't coming to the meeting. It's been cancelled.

A: That's not why N. isn't coming. He's sick.

C: I didn't say that N. wasn't coming because the meeting was cancelled. The meeting is cancelled because N. isn't coming.

- Formal account using *Dynamic modal logic*.

Game theoretic pragmatics

Main framework in the litterature

- A sender S has knowledge to his type $t \in T$.
- He sends a message m.
- Messages have a 'conventional' meaning $[\![m]\!] \subseteq T$
- A receiver R takes an action a upon receiving m.
- Both have outcomes given by utility functions $U_{S,R}(t, m, a)$.
- The classical solution concept used is Perfect Bayesian Equilibrium.

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- Implicatures are automatically derived on the basis of rational principles.
- As in all Gricean accounts, speakers' cooperativity has a central role (aligned utilities).

A signaling game

Some/all

a) Did every student pass the test?

b) Some passed ($\rightsquigarrow$ Not everyone passed)

Some/all game

	m_{some}	$m_{\forall}$	$a_{\exists\neg\forall}$	$a_{\forall}$
$t_{\exists\neg\forall}$	✓	-	1,1	0,0
$t_{\forall}$	✓	✓	0,0	1,1

Sketch of an analysis

Assume S sends something truthful. If R is rational and receives m_{some} he is uncertain of the state, but if he receives $m_{\forall}$, he knows that the state is $t_{\forall}$ and takes $a_{\forall}$. If S knows that R is rational, S always sends $m_{\forall}$ in state $t_{\forall}$. Finally, if R knows that S knows that he is rational, he knows by a counterfactual reasoning upon receiving m_{some} that the state is not $t_{\forall}$.

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- However, implicatures exist there and serve as the basis of deceptive moves.
- **Do such moves require irrational agents, or that one agent mistakes his interlocutor as cooperative?**