Structured Contexts 1: Basics

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Formal Pragmatics, Lecture 1, Jan 10th

Pragmatics

- The received view:
- (Classically conceived), semantics is:
  - $\rightarrow$ The study of truth-conditions (of *sentences*).
  - $\rightarrow$ The study of sentences 'in isolation' (modulo indices *etc*).
  - $\rightarrow$ The study of the meaning a sentence *must* have.

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  - → The study of the meaning a sentence *must* have.
- Pragmatics is non-semantic meaning:
  - → The study of meaning in context (of *utterances*).
  - → The study of meaning in interaction (dialogue).
  - → The study of the cancellable parts of meaning.

Why Formal Semantics? Formal Pragmatics?

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- Formal Semantics is the application of logico-formal methods to the study of meaning.

Implicatures

(1) Julian's performance was satisfactory.

– How can it be that this sentence means something negative in one context, but something positive in another?

(2) a. A: I think Julian and Thomas both did a great job.
b. B: Julian's performance was satisfactiory. $\rightsquigarrow$ *not great*

(3) a. A: Given the standards we usually apply, did Julian perform satisfactorily?
b. B: Julian's performance was satisfactiory. $\not\rightsquigarrow$ *not great*

Implicit Meanings

(4) a. Mark: Karen and I are having a fight, after she went out with Keith and not me.
b. Karen: Well, Mark, you never asked me out.

- Mark implicates says that (i) *Karen went out with Keith* is the reason for (ii) *Karen and Mark are having a fight*.
- Karen implicates agreement with (i), (ii), *and* the implicature.
- Thus, implicatures can be agreed upon, and one can implicate agreement.

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- Thus, implicatures can be agreed upon, and one can implicate agreement.
- Implicatures can also be rejected.

(5) a. A: *The Matrix* is a decent movie.
b. B: Decent? It's brilliant!
b.′ B: It's not decent, it's brilliant!

The static view on context

- This was the standard view for a long time, and it still is somewhat dominant.
  - → E.g. Chris Potts in “Formal Pragmatics”, *Routledge Pragmatics Encyclopedia* (2009).
- In some shape or form, there is a context that fills in blanks, and enriches meaning.
- From syntax, find a logical form (possibly) containing indices.
  - → Possible indices: time, location, speaker, addressee, referents ...

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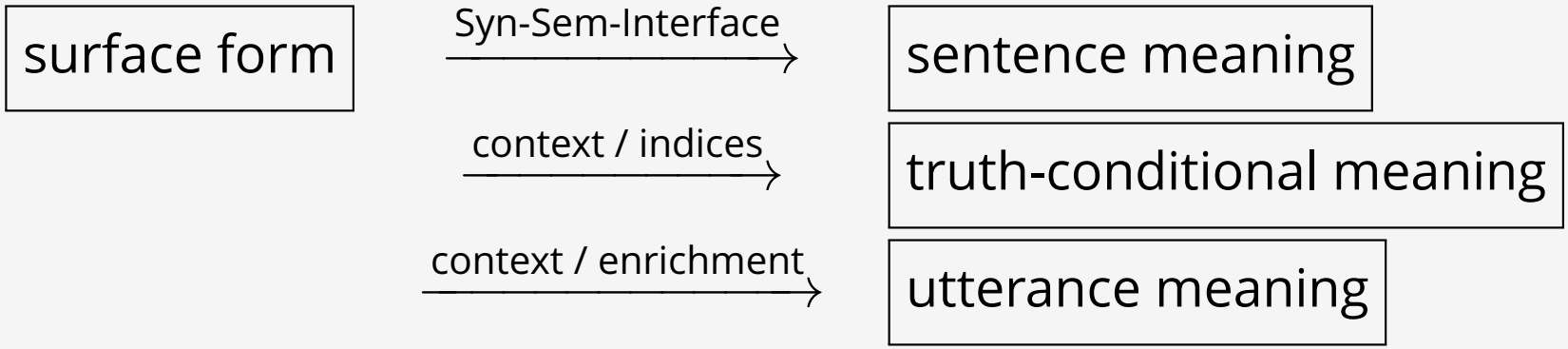
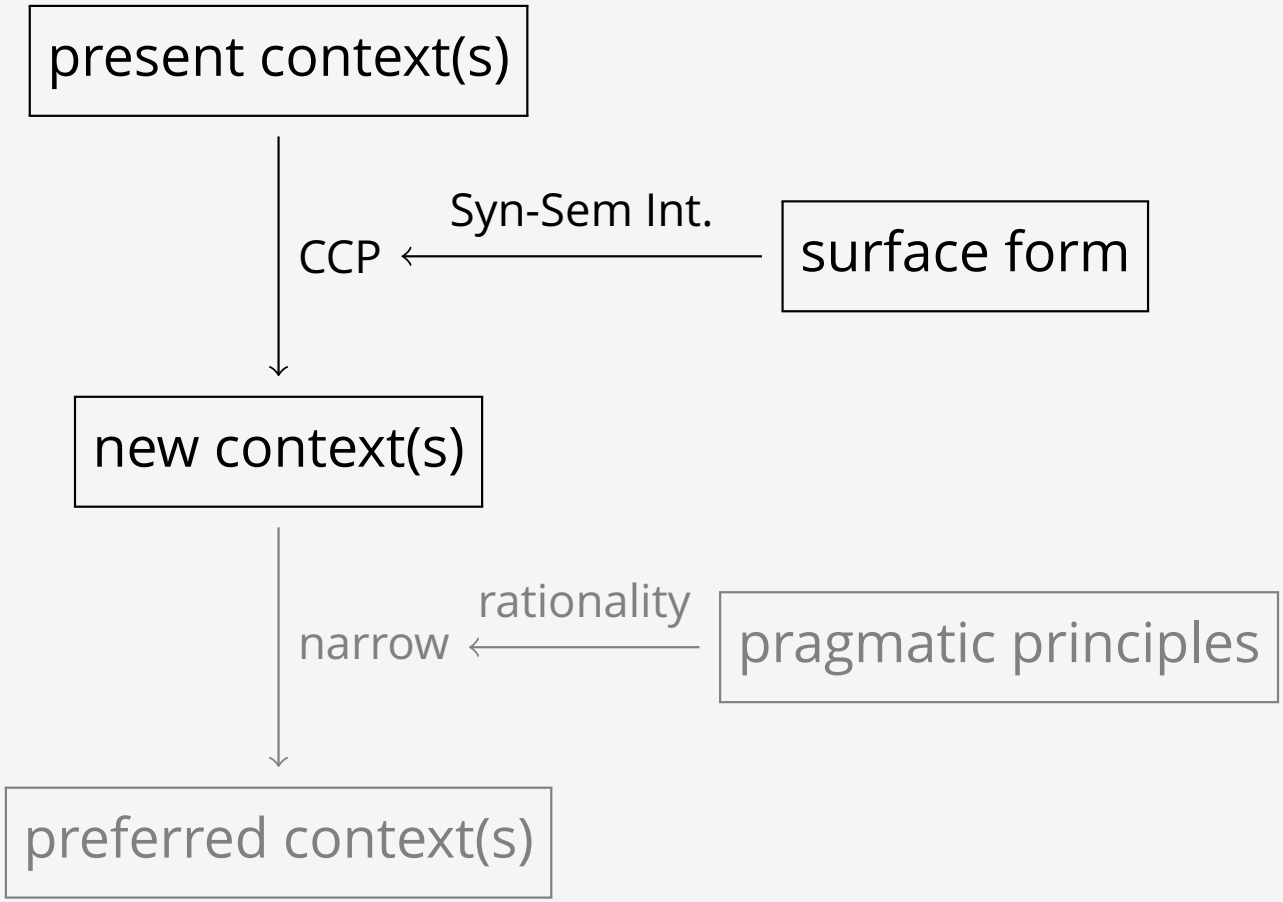


The dynamic view on context

- From syntax, obtain a context change potential (CCP), a relation between contexts.



Speech Acts

- That utterances should change contexts is nothing new.

(6) I hereby name this ship the Queen Victoria.
⇝ *new fact in context:* `name(x,'Queen Victoria')`

Austin, J.L. (1962). *How To Do Things With Words. Harvard UP.*

- Let's say that all utterances do something to the context.

Structured Contexts

- Today will be about structured contexts.
- The idea is that we keep a kind of scoreboard of what happened in the conversation.
- We refer to the scoreboard both for interpretation, and update it.
- One popular approach has it that:
  - → Indicatives operate on a common ground.
  - → Interrogatives operate on questions under discussion (≈ topic)
  - → Imperatives operate on obligations ('to do list').

Speaker A		**Shared**		**Speaker B**
private information	cg	qud	tdl	private information

Non-Ideal Conditions

- The structure of context and the operations on it are still hot research topics.
- Two issues only recently came to attention:
  - → The problem of rejection.
  - → The problem of misunderstanding.
- Many models are models for ‘ideal conditions’, but recent research acknowledges that conditions are almost never ideal.
- A good model should also predict failures in non-ideal conditions.

Consequences

- One of my favorite examples (due to van Rooij)

(7) a. A: There's a dog outside.
b. B: No, it's a cat.

- Rejections like this are unexpected / dispreferred / 'conversational crises'.

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- Moreover, if one takes rejection seriously, one cannot assume that speech acts update the context immediately.

  → They do so only in the absence of rejection.
  → So they are proposals to update the context.

Common Ground

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- The common ground may contain, among others:
  - → Time / location / speaker indices,
  - → salient referents,
  - → record of prior conversation,
  - → record of agreed upon facts,
  - → records of idioms or mutually known language conventions,
  - → goal / purpose /social conventions related to the present dialogue, ...

Linguistic Evidence

- There is very good evidence for mutual knowledge being relevant in dialogue.

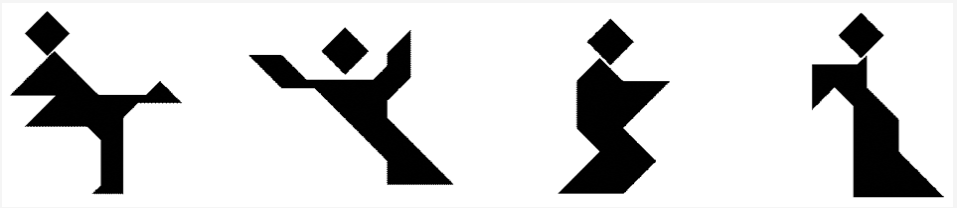
(8) A: John is coming.
B: Who is John?

(9) A: Are you joining us?
B: For what? And who is us?

(10) A: I warned you.
B: No you didn't.

(11) a. A: Wir gehen *doch* heute in's Konzert. *(German)*
b. A: Wir gehen *ja* heute in's Konzert. *(German)*

Psycholinguistic Evidence



Referring Expressions

1. the next one looks like a person who's ice skating, except they're sticking two arms out in front.
2. the next one's the person ice skating that has two arms?
3. the fourth one is the person ice skating, with two arms
4. the next one's the ice skater.
5. the fourth one's the ice skater.
6. the ice skater.

Wilkes-Gibbs, D., & Clark, H. H. (1992). Coordinating beliefs in conversation. Journal of memory and language.

Zarrieß, S. *et al.* (2016). PentoRef: A corpus of spoken references in task-oriented dialogues. 10th Language Resources and Evaluation Conference.

First Formal Problem: What is Common Ground?

- Iterated belief?
- Let K_a and K_b be the modal operators “A knows” and “B knows.”
- “φ is common ground between A and B.”
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  …
- You *can* do this with suitable induction schemes.

Asher, N., & Lascarides, A. (2008). Commitments, beliefs and intentions in dialogue. SemDial 2008.

Shared Basis

The Shared Basis Model (Clark 1996)

A proposition *p* is common ground for members of community C iff there is a *shared basis b* for *p*, that is:

1. every member of C believes (individually) that *b*,
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– The question really is: How is common ground updated?

(12) A: p.
B: $\texttt{accept}(p)$.
Basis: $p \wedge \texttt{accept}(p)$.
CG: p.

Shared Bases: Problems

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$\rightsquigarrow$ `accept(p)` only needs to be confirmed by `acknowledge`.

- This is not uncontroversial: Why should the chain be finite?
- What does confirm `acknowledge`?

Two Generals Problem

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- So how can I be sure that you believe p without reading your mind?

“This is a perplexing situation. It suggests that we face an interesting problem: how to catch the attention of a civilization, or some people in that civilization, still 8.2 light-years away. Also: how to confirm that you have caught that attention in something like the minimum exchange time if your interlocutor hears but for whatever reason does not respond.”

Kim Stanley Robinson, *Aurora*.

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- Specify a regression of to-be-established bases and ground them in a primitive state of mutual attention (e.g. eye contact)

Clark, H.H. (1996). *Using Language*. Cambridge UP.

A Rough Proposal

- These are my own (unpublished) ideas, so they may not exactly pan out.

- Assume successful grounding in the presence of information that can be construed as positive evidence.
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- Grounding an utterance u ($\approx$ Clark's regression) means:
  - $\rightarrow$ It is CG that u happened (Attention).
  - $\rightarrow$ It is CG what u's form means (Understanding).
  - $\rightarrow$ The meaning of u is CG (Uptake).

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- Cautious Update
  - → Update with the weakest expectation that is fulfilled.

Minimal Structured Context

– Let both speakers keep track of a common ground and, individually, of a set of potential future common grounds (expectations).

Speaker A	**Shared**	**Speaker B**
fut-cg$_A$	cg	fut-cg$_B$

'Optimistic' Grounding

- A makes utterance u with intent to ground p.
- Put u in cg. (Basic Attention)
- A updates her expectations:
  - $\rightarrow$ A expects to be understood or to be understood and believed.
  - $\rightarrow$ $\text{cg-fut}_A = \left\{ \text{cg}, \text{cg} \cup \{[\![u]\!] = p\}, \text{cg} \cup \{[\![u]\!] = p, p\} \right\}$
  - $\rightarrow$ $\text{cg} \cup \{p\}$ is not in the cg-fut because of Downward Evidence.
- B makes a response u'. Put u' in CG and update cg-fut_B.
- A parses u' to $[\![u']\!]$ in the best context: $\max_{\subseteq} \text{cg-fut}_A$.
- CG is updated as follows (Cautious Expectation Fulfillment):

$$\text{cg}^{new} = \min_{\subseteq}(\{c \in \text{cg-fut}_A \mid c \models \text{cg} \cup \{[\![u']\!]\}\}).$$

Prediction of Failures

- Here is a nice thing about this idea.
  - $\rightarrow$ Actually, I say, a requirement for any good theory of common ground.
- Absent-minded confirmations induce the belief in the addressee that common ground has been established.
  - $\rightarrow$ Even though it has not.
- This model predicts that misunderstandings of this kind arise (but it is not alone there).

Expectation Fulfillment (Example)

(13)
a. Melvin: What happened to my shirt I was supposed to be getting
b. Lisa: You said you didn't want it
c. Melvin: yeah
d. Lisa: I'm not paying twenty quid for a shirt so you can wear to work

- Melvin talks about a shirt.
- Lisa indicates a property of the shirt she thinks he means.
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(14) e. Melvin: what shirt, like this, warm
f. Lisa: I thought you meant the, the mustard shirt
(BNC file KD3, sentences 3166–3174)

The Disagreement Problem

- Under the ‘ideal circumstances’ presumption, many have modelled an assertion as immediately expanding the common ground.
- This misses the fact that an assertion only becomes common ground if it is undisputed.
- Thus, it is more appropriate to say that an assertion proposes to update common ground. And this proposal itself is up for discussion.

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- This misses the fact that an assertion only becomes common ground if it is undisputed.
- Thus, it is more appropriate to say that an assertion proposes to update common ground. And this proposal itself is up for discussion.
- The following has become (rightfully, I say) popular:
- To make an assertion is to undertake a commitment.
- Common ground is derivative of shared commitment.

  $\rightarrow$ Same problems occur here, of course.

Moore Paradoxes

(15) #a. It's raining and I don't believe that.
b. It's raining and you don't believe that.

- You can't say the first, but you can say the second.
- Note that both propositions cannot be common ground.
- A straightforward explanation: you cannot commit to (15a), but you can commit to (15b).
- But (15b) only proposes to make *it's raining* common ground.

some paper of Philippe Schlenker, I think

Common Ground

Commitment / Projection / Proposals

Commitment / Projection / Proposals

Yes, No, Okay

- I'll now develop a semantics (a pragmatics?) for the particles *yes*, *no* and *okay*.
- *Yes* and *No* can respond to both assertions and polar questions.
- *Okay* can only respond to assertions.

(16) a. A: Sue passed the exam.
b. B: Yes (she did) / No (she didn't) / Okay

(17) a. A: Did Sue pass the exam?
b. B: Yes (she did) / No (she didn't) / #Okay

Yes and No are a bit odd

(18) A: But it's uh yeah it's uh original idea.
B: Yes it is. $\rightsquigarrow$ acceptance.

(19) A: a banana is not it's not really handy .
B: Yes it is. $\rightsquigarrow$ rejection.

(20) A: It's not very well advertised.
B: No, it's not. $\rightsquigarrow$ acceptance.

(21) a. A: Sue failed the exam.
B: Yes she did. / No she didn't.
b. A: Sue did not pass the exam.
B: No she didn't. / Yes she did.

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(21) a. A: Sue failed the exam.
B: Yes she did. / No she didn't.
b. A: Sue did not pass the exam.
B: No she didn't. / Yes she did.

- Say that a proposition has negative polarity if it starts with a $\neg$ and positive polarity otherwise.

  $\rightarrow$ *Yes* targets positive propositions, *No* negative ones.

Schlöder, JJ & Fernández, R (2014). The Role of Polarity in Inferring Acceptance and Rejection in Dialogue, SIGDIAL 15.

A Context Structure

- This context structure is adapted from Farkas & Bruce (2010)

Farkas, D & Bruce, K (2010). *On reacting to assertions and polar questions*.

Speaker A	**Shared**		**Speaker B**
Commitments$_A$	Proposals	Projections	Commitments$_B$
$= C_A$		cg$= C_A \cap C_B$	$= C_B$

- Proposals is a stack containing tuples $\langle T, P \rangle$ where T is a speech act type and P is a content.

- Projections record the different ways in which the current proposal can update the common ground.

Update Rules

- We can now specify certain update rules.

  $\rightarrow$ (different from Farkas & Bruce)

Polar Question

If speaker A makes a polar question with content p, update the context (let Q be the type *question*):

- $C_A^{new} = C_A^{old}$
- $proposals^{new} = proposals^{old} \oplus \{\langle Q, p \rangle\}$
- $projections^{new} = \{\{p\}, \{\neg p\}\}$

Update Rules

Assertion

If speaker A makes an assertion with content p, update the context (let D be the type *declarative*):

- $C_A^{new} = C_A^{old} \cup \{p\}$
- If $\{p\} \in projections^{old}$ and $p \in C_B$:
  - $\rightarrow$ $proposals^{new}$ is $proposals^{old}$ minus its top element.
  - $\rightarrow$ $projections^{new}$ is the projection of the top element of $proposals^{new}$.
- Else:
  - $\rightarrow$ $proposals^{new} = proposals^{old} \oplus \{\langle D, p\rangle\}$
  - $\rightarrow$ $projections^{new} = \{\{p\}\}$

Yes and No

- For a proposition φ:
  - $\rightarrow$ let $+\varphi$ be like φ except that any initial $\neg$ has been removed.
  - $\rightarrow$ let $-\varphi$ be $\neg\varphi$ if φ has no initial $\neg$ and φ otherwise.

Yes

- Let $\Gamma = \{+\varphi \mid \{\varphi\} \in \textit{projection}\}$
- If there is a unique $\varphi \in \Gamma$, update with the assertion of φ.
- Else, break.

No

- Let $\Gamma = \{-\varphi \mid \{\varphi\} \in \textit{projection}\}$
- If there is a unique $\varphi \in \Gamma$, update with the assertion of φ.
- Else, break.

Okay

Okay

- If there is a unique φ such that $\{\varphi\} \in$ *projection*, update with the assertion of φ.
- Else, break.

General Rejection

- *Anything* can be rejected.

(22) a. That's not true! [assertion]
b. I won't answer that! [question]
c. I won't do that! [command]
d. You don't have the authority! [declarative]

- Rejections are themselves proposals that can be discussed and rejected!

(23) a. Anon 2: Just take it into school.
b. Richard: No. No way!
c. Anon 2: Why not? (BNC, KSV, 3786–3789)

- This model does not keep enough records to express this.

Friday

- Friday, we'll delve deeper into the role of the "proposal" field in the context structure.
- Please take a look at Craige Roberts's "Information structure in discourse: Towards an integrated formal theory of pragmatics" (2012) in *Semantics & Pragmatics* (not the 1996 version).