Lecture 37:
Modelling Conversations

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Some slides based on those of Christina Unger

Where are we?

- Can parse sentences, translate to FOL or interpret in a model.

- Can process sequences of sentences, while keeping referents straight and making sense of pronouns. (DRT)

- Use E-PDL to keep track of conversation: public statements restrict set of worlds.

- Reason with common knowledge. Deal with presuppositions by adding to common knowledge

Gap

- Parse software in text generates parse trees (with annotations).
  - Need AST's — Haskell terms
  - P2> parses "Atreyu gave the sword to the princess"

- Can write a tree walker to convert parse trees to ASTs.

Conversations

- Take broader look at contexts for conversations.

- Structural approach to
  - states of conversation
  - Responding to statements and questions
  - Interpreting hypotheticals
  - What conversational context license uses of "yes", "no", and "OK"

Preview

- Explain the following:
  - A: Alice is not coming to the party tonight.
  - B: No, (she isn't)./ Yes, (she isn't)./ Yeah, no.

  - A: Jahan just arrived.
  - B: Yes, I know./ #Yes, I had no idea/ OK.

Preview

- Imperatives & performative modals:
  - Mother: Go clean your room, Jahan!
  - Father: Yes, go clean your room!
  - Jahan: #Yes./No!/OK/Yes, I will.

  - Mother: You must clean your room this weekend, Jahan!
  - Jahan: Yes./No./OK.

Review work on reactions

Farkas & Bruce, *On reacting to assertions and polar questions,*
Journal of Semantics, vol 27, pp 81-118, 2009.

Context Structure Should:

- Treat assertions as proposals that may be rejected.

- Account for similarities & differences between assertions and questions (*and later, imperatives*).

- Support marked moves like retracting assertions and questions and "agreeing to disagree".

- Characterize "happy endings" of conversations.

- Support explanations of how polarity particles work.

Context Structure Components

A	Table	B
A's public commitments	*The Table*	*B's public commitments*
	$\mathbf{cg}_k$: *Common ground*	

- <u>Public Commitments</u>: For each participant

- <u>Common Ground</u>: Propositions accepted by both

- <u>Table</u>: Keeps track of matters under discussion.

- <u>Projected Sets</u>: Collection of possible future common grounds if table cleared

Features of Representation

- Separating commitment sets allows disagreements between participants

- Conversational goal: empty table by increasing common ground

- Contents of table arranged as "stack"
  - New items placed on "top", remove items from top (*LIFO*)
  - Conversation in possible end state only if table empty
  - Addition to table impacts projected sets
    - changes expected possible common grounds after table cleared

Assertions & Context

A	Table	B
	$cg = cg_o$, $PS = \{cg_o\}$	

- After assertion of p by speaker A:

A	Table	B
p	A: p	
	$cg: = cg_o$, $PS = \{cg_o \cup \{p\}\}$	

Reacting to an Assertion

B accepts p:

A	Table	B
	$cg: = cg_o \cup \{p\}$, $PS = \{cg_o \cup \{p\}\}$	

B rejects p:

A	Table	B
p	A: p B: ¬p	¬p
	$cg: = cg_o$, $PS = \varnothing$ ←— *Crisis!*	

Always remove inconsistent sets from PS

Reaction to Crisis

- Reassess commitment

- Agree to disagree
  - Individual beliefs consistent
  - ... but not union of all!

Questions

Polar *(Yes-No)* Questions

- Asking question places question on table

- Not added to any commitment list.

- Results in multiple projected sets.

Asking Questions

A asks ?p:

A	Table	B
	A: ?p	
	cg: = cg_o, PS = {$cg_o \cup$\{p\}, $cg_o \cup$\{¬p\}}	

B answers p:

A	Table	B
	A: ?p B: p	p
	cg: = cg_o, PS = {$cg_o \cup$\{p\}}	

Accepting Answer

A accepts p:

A	Table	B
cg: = $cg_o \cup \{p\}$, PS = $\{cg_o \cup \{p\}\}$		

Rejection leads to similar crisis as with assertion.

Questions

- Answer to question eliminates elements of projection sets.

- Subtle differences between positive and negative questions. Affects what is placed on table but not projected sets.

- Possible to withdraw question and recalculate projected sets. *(Parallel to "agreeing to disagree")*

Polarity Particles

Polarity Particles

- Occur at leftmost edge of responding moves:
  - Yes, ... / No, ... / OK, ...

- Responding moves
  - Reaction to previous move that places a proposition denoting sentence fragment on table
  - Takes proposition on top of table as antecedent
  - Commits its author to antecedent proposition or its complement.

- Can also be realized as bodily signals (e.g. nod)

Meaning of Polarity Particles

- Convey two kinds of meaning
  - Absolute polarity features [+], [-]
  - Relative polarity features: [*same*], [*reverse*]
- Yes: [+],[*same*]
- No: [-], [*reverse*]
- OK, sure: [*same*]
- no way: [*reverse*]

Examples:

Neutralization

- A: Jahan's just arrived.
- B: Yes, (she has). / #No, (she has).   [*same*,+]

- A: Jahan has not arrived yet
- B: Yes, (she hasn't)./ No, (she hasn't)/ Yeah no, (she hasn't).
  [*same*,-]
- A: Jahan has just arrived.
- B: #Yes, she hasn't./ No, (she hasn't).   [*reverse*,-]

- Has Jahan not arrived yet?
- Yes, she has. / No, she has.   [*reverse*,+]

Conclusions

- *Yes* needs [+] or [*same*]
- *No* needs [-] or [*reverse*]
- *Yeah, no* realizes [*same*] and [-]
- Languages like Hungarian and Romanian don't allow neutralization.
  - Particles are associated with absolute value.

Gunlogson's Source

Key Ideas

- Commitments to truth have sources (authority)
  - Can accept truth based on another source

- Annotate propositions in discourse commitment lists and common ground with source

- *Default assertion*: Add p to author's DC list, with author as source.

Yes/No Responses

- Use of yes/no in responding assertions requires author as source:
  - A: Jahan's just arrived.
  - B: Yes, (I know). / #Yes, I had no idea. / No, she hasn't.
  - *Yes/No response register's B as source along with A.*

- Other forms of acceptance don't register speaker as source:
  - A: Jahan's just arrived.
  - B: Aha. / OK, (I had no idea).
  - *OK signal's acceptance without taking responsibility as source.*

Polar Questions

- Effect of polar question asked by Q to A:
  - Add $<S[I], \{p, \neg p\}>$ to top of Table.
  - Project two future cg's: $\{cg_0 \cup \{p^A\}, cg_0 \cup \{\neg p^A\}\}$

- Welcome consequences:
  - Acceptance of answer to normal polar question cannot be answered with *yes*, but can be accepted with *OK, aha*.
  - Acceptance of answer to quiz question can be signaled by *yes*.
  - *OK* cannot be used to answer a question affirmatively.

Summary of Yes, OK, No

- Distribution of uses/meaning in responses:
  - Yes, OK: acceptance of proposal; No: rejection
  - Yes, No may express absolute polarity; OK does not
  - Yes, No require speaker as source; OK does not

Other Languages Richer Set of Polar Particles

- Romanian: *Da is "yes", Nu is "no"*
  - A: Ana a plecat? *Has Ana left?*
  - B: Nu/ Nu, n-a plecat./*Ba nu?/*Ba nu, n-a plecat. *No she didn't*

  - A: Ana a plecat. *Ana left.*
  - B: Ba nu, n-a plecat. / *Nu, n-a plecat. *No, she didn't*

Other Languages Richer Set of Polar Particles

- Romanian:
  - A: Ana nu a plecat? *Didn't Ana leave?*
  - B: Ba da/Ba e plecat/Ba da e plecat. *You are wrong, she did.*

  - A: Ana nu a plecat. *Ana didn't leave.*
  - B: Ba da/Ba a plecat./Ba da, a plecat. / *You are wrong, she did.*

  - *Ba indicates [reverse]*

French

- Si signals reverse:
  - A: Anne n'est pas partie. *Anne didn't leave*
  - B: Mais si. *You are wrong, she did.*

  - A: Anne n'est pas partie? *Didn't Anne leave*
  - B: Mais si. *Yes, she did.*
  - mais indicates [reverse][+]

- German doch similar

Interesting Contrast Between Yes and No

- No can get antecedent from context, accommodation of question necessary for yes.
  - A child is about to do something and looks at you:
    - You: Yes/OK, go ahead. / No!
  - A child is about to stick his finger in a socket
    - No! Stop! / #Yes, go ahead

Conclusion

- Similarities of assertions and polar questions.
  - Place item on Table
  - Project future common ground(s).
  - Responding moves similar in form
    - Particles may reflect absolute or relative polarity
- Differences
  - Negative response to question does not throw conversation into crisis
  - If crisis, agree to disagree or put aside the question

Imperatives

Imperatives

- Imperative illocutionary force:
  - Clean your room! (*command*)
  - Go the the party then, if that's what you want! (*permission*)
  - Take a left at the next corner. (*advice,instruction*)
  - Get well soon! (*wish*)
  - Go to hell! (*curse*)
  - Be blonde! (*absent wish*)
  - Don't have gotten in another fight! (*past wish*)

Semantic Properties

- No truth conditionality
- Future orientation
- Addressee is intended to be initiator of event exemplifying the propositional content of imperative.

Basic data

- Mother: Clean your room, Jahan!
- Jahan: OK/Sure/#Yes./No!/No, I won't/(?) Yes, I will

- Mother: You must clean your room this weekend, Jahan!
- Jahan: OK/Sure/Yes./Yes, I will./No (I don't have to/I won't).

- Mother: Clean your room this afternoon, Johnny!
- Father: Yes, clean your room! / No, don't clean your room! / OK, clean your room.

More Basic Data

- Mother: Johnny you must clean your room.
- Johnny: No, (I don't have to) but I will do it anyway.

- Mother: Clean your room!
- Johnny: #No, but I will do it anyway.

Observations

- Assertion acceptance different from imperative acceptance.
  - No solo *yes* as reply to command.

- Parallelism between performative modal *must* and command breaks down with acceptance signals
  - Evidence that a performative modal involves an assertion, but commands don't.

- Difference between solo *Yes* and *Yes, I will*.

- Difference between solo *Yes* and *No*.

More Observations

- *Yes* can occur with imperative sister
  - Signals author as another authority/source

- *Yes* and *No* can occur in utterance w/non-assertive force.

Context Structures for Imperatives

- Update context structure to include *ToDo* lists for each participant.
  - p on *ToDo* list of X iff
    - p is to be brought about by X in future
  - p is under deontic obligation to bring p about.
- Difference between p in cg and p in *ToDo*:
  - Suppose we know that tomorrow the protestors will force military to oust Mubarek.
  - It does not follow that ousting Mubarek is on the military's ToDo list now.

Discourse Commitments

- Portner: Two types of discourse commitments:
  - Commitment to truth
    - Propositions are taken as true of current world by participant(s)
  - Commitment to action
    - *ToDo$_X$* propositions are those X publicly commits to bringing about.
    - X intends/plans to be the initiator of e_p
    - X intends/plans to bring about that p is true

Context Change Potential

- CCP of imperative:
  - Add imperative sentence form and propositional content, p, to Table.
  - Include info on author (Sp) and addressee (Ad).
  - Propose addition of p to ToDo list of Ad with Sp as source, so project acceptance in Projected Sets.

More CCP

- <u>Non-redundancy condition</u>: p is not already in ToDo$_{Ad}$ or in Common Ground
- <u>Felicity condition</u>: Sp is in right power relation relative to Ad to propose addition to Ad's ToDo list.

Back to basic data

- Mother: Clean your room, Jahan!
- Jahan: OK/Sure/#Yes./No!/No, I won't/(?) Yes, I will
  - *Yes, I will* provides assertion (w/source) as well as acceptance.
- Mother: You must clean your room this weekend, Jahan!
- Jahan: OK/Sure/Yes./Yes, I will./No (I don't have to/I won't).
  - Yes is fine, but different meaning from OK.
- Mother: Clean your room this afternoon, Johnny!
- Father: Yes, clean your room! / No, don't clean your room! / OK, clean your room.
  - Yes adds father as source/authority

More Basic Data

- Mother: Johnny you must clean your room.
- Johnny: No, (I don't have to) but I will do it anyway.
  - Rejects necessity (and hence assertion), but agrees to take implied action
- Mother: Clean your room!
- Johnny: #No, but I will do it anyway.
  - No assertion to reject

Conclusions

- Context architecture represents important aspects of discourse in such a way that
  - can model CCP of assertions, interrogatives, & imperatives
  - can recognize and interpret responding moves
- Yes, no, & OK:
  - more complex than first appear
  - represent not only absolute and relative polarity, but also reflect source/authority

Questions?