Introduction to Semantics with Type Theory with Records for Natural Language: Lecture 5

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Based on Ginzburg, 2012, Chapter 7 (on the website).

A corpus study of NSUs

- Corpus study of NSUs in the BNC (Fernández & Ginzburg, 2002; Fernández, 2006). A randomly selected section of 200-speaker-turns from 54 BNC files. The examined sub-corpus contains 14,315 sentences.
- A total of 1299 NSUs were found. Of these, 1283 were labelled according to a typology described below, the remaining 16 instances did not fall in any of the categories of the taxonomy.

NSUs: some corpus data

NSU class	Example	Total
Plain Acknowledgement	*A: . . . B: mmh*	599
Short Answer	*A: Who left? B: Bo*	188
Affirmative Answer	*A: Did Bo leave? B: Yes*	105
C(larification) E(llipsis)	*A: Did Bo leave? B: Bo?*	
Reprise sluices	*A: Did Bo Leave? B: Who?*	92
Repeated Ack.	*A: Did Bo leave? B: Bo, hmm.*	86
Rejection	*A: Did Bo leave? B: No.*	49
Factual Modifier	*A: Bo left. B: Great!*	27
Repeated Aff. Ans.	*A: Did Bo leave? B: Bo, yes.*	26
Helpful Rejection	*A: Did Bo leave? B: No, Max.*	24
Check question	*A: I'm coming. Okay?*	22
Filler	*A: Did Bo . . . B: leave?*	18
Bare Mod. Phrase	*A: Max left. B: Yesterday.*	15
Propositional Modifier	*A: Did Bo leave? B: Maybe.*	11
Direct Sluice	*A: Someone left. B: Who?*	11
Conjunction + frag	*A: Bo left. B: And Max.*	10
Other		16
Total dataset		**1109**

Table 2: BNC NSU corpus study

Which classes can we already describe?

Yes

- treat 'yes' as an adverb (English: intransitive, IC[+])

(1)
$$\begin{bmatrix} \text{PHON} : \texttt{yes} \\ \text{CAT} = \textit{adv[+ic]} : \text{syncat} \\ \text{DGB-PARAMS.MAX-QUD} : \text{PolQuestion} \\ \text{CONT} = \text{max-qud}(\boxed{\ }) : \text{Prop} \end{bmatrix}$$

Right?

(2)
$$\begin{bmatrix} \text{phon} : \texttt{right} \\ \text{cat.head} = \text{interj} : \text{syncat} \\ \text{dgb-params} : \begin{bmatrix} \text{spkr} : \text{IND} \\ \text{addr} : \text{IND} \\ \text{utt-time} : \text{TIME} \\ \text{LatestMove.content} = \\ \text{Assert(spkr,addr,p)} : \text{IllocProp} \end{bmatrix} \\ \text{cont} = \text{Check(spkr,addr,utt-time,p?)} : \text{IllocProp} \end{bmatrix}$$

Really?

(3)
$$\begin{bmatrix} \text{phon} : \texttt{really} \\ \text{cat.head} = \text{interj} : \text{syncat} \\ \text{dgb-params} : \begin{bmatrix} \text{spkr} : \text{IND} \\ \text{addr} : \text{IND} \\ \text{utt-time} : \text{TIME} \\ \text{LatestMove.content} = \\ \text{Assert(addr,spkr,p)} : \text{IllocProp} \end{bmatrix} \\ \text{cont} = \text{Doubt(spkr,addr,utt-time,p?)} : \text{IllocProp} \end{bmatrix}$$

What remains to be done?

- partial parallelism: short answers, direct sluicing
- metacommunicative NSUs
- Genre dependent NSUs

Sententialism v. Dialogue oriented constructionism I

- How should NSUs be incorporated in grammatical analysis?
- This depends to a large extent on whether NSUs are to be assimilated to another grammatical phenomenon such as phonological reduction or anaphora. (See e.g. for sluicing Ross, 1969; Chung, Ladusaw, & McCloskey, 1995; Merchant, 2001, for short answers Morgan, 1973; Merchant, 2004.)
- In theories that follow this route (*unitarian* theories), ellipsis resolution is associated with a single, typically extra-grammatical mechanism.
- Alternatively, NSUs are in some significant way *sui generis*: in *constructionist* theories, NSUs are incorporated in the grammar as distinct constructions which specify a.o. the contextual characteristics which govern their use.

Sententialism v. Dialogue oriented constructionism II

- Extensive argumentation against underlying sententialism in (Ginzburg & Sag, 2000; Stainton, 2006; Sag & Nykiel, 2011; Ginzburg, 2012) based on:
  - Syntactic and semantic mismatches between NSU and reconstruction correlate.
  - Contextual explicitness.
  - Language acquisition: acquisition of NSUs is a long drawn out process of $>$ 2 years with various types of NSUs unexpectedly delayed relative to uniformity expectation of sententialism (Ginzburg & Kolliakou, 2009, Kolliakou and Ginzburg, 2012)

Focus establishing constituents

- In all the cases we have considered so far, the NSU can be described completely on the basis of the fragment's own grammatical characteristics and MaxQUD (MAX-PENDING in the case of acknowledgements.).
- One additional contextual parameter to track, an antecedent sub-utterance (of utterance which is MAX-QUD).
- Intuitively, this parameter provides a partial specification of the focal (sub)utterance, and hence it is dubbed the *focus establishing constituent* (FEC)
- Varying roles played by the FEC: in some cases it is crucial for the semantic composition, in others it plays a disambiguating role via morphosyntactic or phonological parallelism.

Focus establishing constituents

- Direct sluicing involves in essence building a question whose domain derives from the fragment whP and whose range derives from MaxQUD :

  (4) a. A: A student complained about one of our teachers.
  B: Who?

- Content of MaxQUD after A's utterance

$$([]) \begin{bmatrix} x : \text{Ind} \\ c1 : \text{student}(x) \\ y : \text{Ind} \\ c2 : \text{teacher}(y) \wedge \text{possess}(w,y) \\ c0 : \text{complain}(x,y) \end{bmatrix}$$

- quest-dom of the whP: $\begin{bmatrix} z : \text{Ind} \\ c1 : \text{person}(z) \end{bmatrix}$
- We need to abstract over the index associated with a WhP , in (5c) the index z.

Focus establishing constituents

- If no identification of z with x or y happens, the resultant content will be as in (5a), whereas what we desire is (5b):

(5) a.
$$(\mathsf{r} : \begin{bmatrix} \mathsf{z} : \mathsf{Ind} \\ \mathsf{c1} : \mathsf{person}(\mathsf{z}) \end{bmatrix}) \begin{bmatrix} \mathsf{x} : \mathsf{Ind} \\ \mathsf{c1} : \mathsf{student}(\mathsf{x}) \\ \mathsf{y} : \mathsf{Ind} \\ \mathsf{c2} : \mathsf{teacher}(\mathsf{y}) \wedge \mathsf{possess}(\mathsf{w},\mathsf{y}) \\ \mathsf{c0} : \mathsf{complain}(\mathsf{x},\mathsf{y}) \end{bmatrix}$$

b.
$$(\mathsf{r} : \begin{bmatrix} \mathsf{z} : \mathsf{Ind} \\ \mathsf{c1} : \mathsf{person}(\mathsf{z}) \end{bmatrix}) \begin{bmatrix} \mathsf{x} = \mathsf{r.z} : \mathsf{Ind} \\ \mathsf{c1} : \mathsf{student}(\mathsf{x}) \\ \mathsf{y} : \mathsf{Ind} \\ \mathsf{c2} : \mathsf{teacher}(\mathsf{y}) \wedge \mathsf{possess}(\mathsf{w},\mathsf{y}) \\ \mathsf{c0} : \mathsf{complain}(\mathsf{x},\mathsf{y}) \end{bmatrix}$$

Focus establishing constituents

- For sluicing, in parallel with this semantic dependency comes a syntactic dependency: Ross, 1969 pointed out, with reference to German, that the fragment must concord to the case requirements of the antecedent NP.
- Similar facts hold in various other languages where case is overtly expressed, as documented in detail in Merchant 2002

(6) a.
Er will jemandem schmeicheln, aber sie wissen nicht wem/#wen.
He wants someone-dat flatter, but they know not who-dat/#who-ac
He wants to flatter someone, but they don't know whom.

b.
Er will jemanden loben, aber sie wissen nicht wen/#wem.
He wants someone-acc praise, but they know not who-acc/#who-dat.
He wants to praise someone, but they don't know whom.

Focus establishing constituents

- There are a number of NSU types where a syntactic dependency exists between an antecedent and the fragment, without there being a semantic dependency above and beyond what MaxQUD encodes already:

(7) a.

A: lemi hixmeta? B: #moti/lemoti.
To-who flattered-2nd-sg? moti/to-moti
A: Who did you flatter? B: Moti.

b.

A: et mi šibaxt? B: et moti/#lemoti.
def-acc who praised-2nd-sg? def-acc moti/to-moti
A: Who did you praise? B: Moti.

- $CE_{intended-content}$ constitutes perhaps the most extreme case of parallelism, since it involves segmental phonological parallelism with the source:

Focus establishing constituents

- Given this, we can pair QUDs and FEC 's as part of contextual specification.
- Concretely this amounts to changing the type of QUD from *list(Questn)* to *list(Info-struc)*, where Info-Struc is the following type:

(9) $$\text{Info-struc} = \begin{bmatrix} \text{q} : \text{Questn} \\ \text{fec} : \text{set(LocProp)} \end{bmatrix}$$

- FECs get introduced by minor modification of Ask-QUD incrementation and CCURs.

Short Answers

- Short answer—informal meaning: Function application of max-qud to fragment's content; syn parallelism with FEC
- max-qud(frag.cont)

(10) *decl-frag-cl* (quantifier-free version) =

$$\begin{bmatrix} \text{CAT} = v : \text{syncat} \\ \text{DGB-PARAMS.MAX-QUD} : \begin{bmatrix} \text{q} : \text{UnaryWhQuestion} \\ \text{fec} : \text{LocProp} \end{bmatrix} \\ \text{cont} = \text{max-qud.q(hd-dtr.cont.x)} : \text{Prop} \end{bmatrix}$$

$$\Big|$$

$$\text{hd-dtr:} \quad \begin{bmatrix} \text{cat} = \text{max-qud.fec.cat} : \text{Syncat} \\ \text{cont} : \begin{bmatrix} \text{x} : \text{IND} \end{bmatrix} \end{bmatrix}$$

Short Answers I

- A: Who did Jo visit? B: Bo
- As a result of A's utterance:
  MaxQUD =
  q = $\lambda x Visit(j, x)$: UnaryWhQuestion,

$$\left\langle \text{fec} : \left[\begin{array}{l} \text{PHON} : \texttt{who} \\ \text{CAT.HEAD} = \text{N} : \text{POS} \\ \text{CONT} : \left[\text{x} : \text{IND} \right] \\ \text{QUEST-DOM} = \left\langle \left[\begin{array}{l} \text{y} = \text{cont.x: IND} \\ \text{restr} : \text{person(y)} \end{array} \right] \right\rangle : \text{list(RecType)} \end{array} \right] \right\rangle$$

Short Answers I

- Short answer analysis using *decl-frag-cl*:

$$\left[\begin{array}{l}\text{dgb-params.max-qud} = \left[\begin{array}{l}\text{q} = \lambda x \mathit{Visit}(j,x) \\ \text{fec} = \texttt{who} : \text{LocProp}\end{array}\right] : \text{InfoStruc} \\ \text{cont} = \lambda x \mathit{Visit}(j,x)(\mathit{hd} - \mathit{dtr}.\mathit{cont}.x) \\ \mapsto \text{Visit(j,hd-dtr.cont.x)} : \text{Prop}\end{array}\right]$$

$$\text{hd-dtr} : \left[\begin{array}{l}\textsc{phon} : \text{bo} \\ \textsc{cat.head} = \text{N} : \text{POS} \\ \textsc{dgb-params}: \left[\begin{array}{l}\text{x} : \text{IND} \\ \text{restr}^{\mathit{facts}} : \text{Named(x,bo)}\end{array}\right] \\ \textsc{cont} : \left[\text{x} = \text{c-params.x} : \text{IND}\right]\end{array}\right]$$

Short Answers II

Short Answers: LD benchmark

- Distance benchmark: accommodate long distance short answers.

(11) a. A: Hi
B: Hi
A(1): Who's coming tomorrow?
B(2): Jo.
A(3): I see.
B(4): She's back from Mauritania.
A(5): Ah.
B(6): Mike.
A(7): Moroney?
B(8): Yeah.
(9) A bunch of others too.

Short Answers: LD benchmark

Utt.	Move Update	QUD
initial	MOVES = ⟨⟩	
	QUD = ⟨⟩	
	FACTS = cg1	
1	Ask(A,B,q0)	⟨ q0,Who⟩
2	Assert(B,A,p1)	⟨ p1?,fec: null⟩, ⟨ q: q0,fec: Who⟩
3	LatestMove := Accept(A,B,p1)	⟨ q: q0,fec: Who⟩
4	LatestMove := Assert(B,A,p2)	⟨ q: p2?,fec: null⟩, ⟨ q: q0,fec: Who⟩
5	LatestMove := Accept(A,B,p2)	⟨ q: q0,fec: Who⟩
6	LatestMove := Assert(B,A,p3)	⟨ q:p3?,fec: null⟩, ⟨ q: q0,fec: Who⟩
7	LatestMove := Ask(A,B,m?)	⟨ q:m?,fec: null⟩, ⟨ q: q0,fec: Who⟩
8	LatestMove := Confirm(A,B,m)	⟨ q: q0,fec: Who⟩

Sluicing

- Fernández, Ginzburg, & Lappin, 2004 propose the existence of a four way ambiguity, an ambiguity they demonstrate to be reliably coded by human subjects:

(12) a. **Direct:** A: Can I have some toast please?
B: Which sort? [BNC, KCH, 104–105]

b. **Reprise**: Pat: You might find something in there actually.
Carole: Where? [BNC, KBH, 1817]

c. **Repetition:** June: Only wanted a couple weeks.
Ada: What?
June: Only wanted a couple weeks.

d. **Wh-anaphor**: Cathy (In): Where do Rosey and Jim live? I know (pause) I know where they live.
Barbara (Ch): Where?

Direct Sluicing

- Direct sluice—informal meaning: λ-abstraction of fragment's domain
  from max-qud's proposition in which fragment's content substituted for FEC's content. (sem and syn parallelism with FEC)

Direct Sluicing

- Direct sluice—informal meaning: λ-abstraction of fragment's domain
  from max-qud's proposition in which fragment's content substituted for FEC's content. (sem and syn parallelism with FEC)
- λ frag.dom (max-qud([])(FEC.cont $\mapsto$ frag.cont))
- See Ginzburg 2012 Chapter 7 for details

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What drives the dialogue?

- Going beyond Free Speech— basic intuition: a move can be made if it *relates to the current activity*.
- In some cases the activity is very clearly defined and tightly constrains what can be said. In other cases the activity is far less restrictive on what can be said.

What drives the dialogue?

(13)
a. Buying a train ticket: c wants a train ticket: c needs to indicate where to, when leaving, if return, when returning, which class, s needs to indicate how much needs to be paid
b. Buying in a boulangerie: c needs to indicate what baked goods are desired, b needs to indicate how much needs to be paid
c. Buying goods in a minimarket stationed in a petrol station: c needs to show what she bought, s needs to check if c bought petrol and to tell c how much needs to be paid.
d. Chatting among friends: first: how are CPs and their near ones?
e. Chatting with a young child: first: how are CPs and their near ones?
f. Buying in a boulangerie from a long standing acquaintance: combination of (c) and (e)

What drives the dialogue?

- Trying to operationalize activity relevance presupposes that we can classify conversations into various genres (building on work by Staffan Larsson in IBIS, repackaged BDI.)
- No taxonomy offered here!
- How to classify a conversation into a genre? One way is by providing a description of an IS of a CP who has successfully completed such a conversation.
- Final states of a conversation will then be records of type T for T a subtype of DGB_{fin}, renamed GenreType

(14)
$$\begin{bmatrix} \text{facts} : \text{Prop} \\ \text{qnud} = \text{list} : \text{list(question)} \\ \text{moves} : \text{list(IllocProp)} \end{bmatrix}$$

Some Genres

- CasualChat:

$$\begin{bmatrix} \text{A} : \text{Ind} \\ \text{B} : \text{Ind} \\ \text{t: Time} \\ \text{c1} : \text{Speak(A,t)} \vee \text{Speak(B,t)} \\ \text{facts} : \text{Set(Prop)} \\ \text{qnud} : \text{list(question)} \\ \text{c2: } \left\{\lambda P.P(A), \lambda P.P(B)\right\} \subset \text{qnud} \\ \text{moves} : \text{list(IllocProp)} \end{bmatrix}$$

Some Genres

- PetrolMarket:

$$\begin{bmatrix} A : Ind \\ B : Ind \\ t: \ Time \\ c1 : \ Speak(A,t) \vee Speak(B,t) \\ facts : \ Set(Prop) \\ qnud : \ list(question) \\ c2: \left\{ \begin{array}{l} \lambda x.InShopBuy(A,x), \\ ?BuyPetrol(A,z), \lambda x.Pay(A,x) \end{array} \right\} \subset qnud \\ moves : \ list(IllocProp) \end{bmatrix}$$

Some Genres

- BakeryChat:

$$\begin{bmatrix} \text{A} : \text{Ind} \\ \text{B} : \text{Ind} \\ \text{t: Time} \\ \text{c1} : \text{Speak(A,t)} \vee \text{Speak(B,t)} \\ \text{facts} : \text{Set(Prop)} \\ \text{qnud} : \text{list(question)} \\ \text{c2:} \left\{ \begin{array}{l} \lambda P.P(A), \lambda P.P(B), \ \lambda x.\text{InShopBuy(A,x)}, \\ \lambda x.\text{Pay(A,x)} \end{array} \right\} \subset \text{qnud} \\ \text{moves} : \text{list(IllocProp)} \end{bmatrix}$$

Activity relevance

- Activity relevance: one can make an initiating move m0 if one believes that that the current conversation updated with m0 is of a certain genre G0.
- Making move *m*0 given what has happened so far (represented in *dgb*) can be *anticipated* to conclude as final state *dgb*1 which is a conversation of type G0:

(15) m0 is relevant to G0 in dgb0 for A (**GenreRelevant(m,G0,dgb0)**) iff A believes that $outcome(dgb0 \bigoplus_{moves} m0, G0)$ will be fulfilled. That is, iff there exists dgb1 such that $dgb0 \bigoplus_{moves} m0 \sqsubset dgb1$ and such that $dgb1 : G0$

Activity relevance generalized

- an initiating move *m*0 might in itself carry QUD or FACTS presuppositions, in other words involve some form of accommodation.
- In order to make this tractable, one needs to ensure a very tight fit between the QUD accommodated entity $q(mo)$ and the content of m0.
- I will assume that the appropriate relation is *co-propositionality*:

Activity relevance generalized

(16) m0 is relevant to G0 in dgb0 QUD–presupposing q(m0) (**GenreRelevant**$^{q(m0)}$**(m,G0,dgb0)**) iff A believes that the outcome

outcome(dgb $\cup$

$$\left[\begin{array}{l} \text{dgb.moves} := \left\langle \text{m0,dgb.moves} \right\rangle \\ \text{dgb.qud} := \left\langle \text{q0,dgb.qud} \right\rangle \\ \text{c1: Copropositional(qud-contrib(m0.cont),q(m0))} \end{array}\right]$$

,G0)

will be fulfilled.

Private parts of Information States I

- Following BDI tradition (Bratman, 1987; Georgeff & Lansky, 1987) and Larsson, 2002.
- private beliefs is a necessary private counterpart to the public FACTS.
- AGENDA is a corresponding counterpart to Moves.
- PLAN is a type of information which does not have a public counterpart, but plays an important role.
- Here renamed GENRE, as in (17a).

(17) a. Private $=$

$$\begin{bmatrix} \text{genre} : \text{GenreType} \\ \text{beliefs} : \text{Prop} \\ \text{agenda} : \text{list(IllocProp)} \end{bmatrix}$$

Private parts of Information States II

b. TotalInformationState (TIS) =

$$\begin{bmatrix} \text{dgb} : \text{DGB} \\ \text{private} : \text{Private} \end{bmatrix}$$

Initiating move

- an initiating move ip0 can be made relative to an information state given that: (a) QUD is empty and (b) given that the current genre is G0, A believes that ip0 uttered relative to q(ip0) is relevant to G0 in dgb0:

(18) Initiating Move:

$$\left[\begin{array}{l}
\text{pre}: \left[\begin{array}{l}
\text{dgb}: \left[\text{qud} = \langle\rangle : \text{eset(Question)}\right] \wedge_{merge} \text{DGB} \\
\text{private} = \left[\begin{array}{l}
\text{genre: GenreType} \\
\text{beliefs}: \text{Prop} \\
\text{agenda}: \text{list(IllocProp)} \\
\text{ip0}: \text{IllocProp} \\
\text{q0}: \text{Question} \\
\text{c1}: \rightarrow(\text{beliefs,GenreRelevant(ip0,q0,dgb,genre)}\ )
\end{array}\right] : \text{Privat}
\end{array}\right] \\
\text{effects}: \text{TurnUnderspec} \wedge_{merge} \\
\qquad \left[\begin{array}{l}
\text{LatestMove} = \text{pre.private.ip0}: \text{IllocProp} \\
\text{qud} = \left\langle \text{pre.private.q0} \right\rangle : \text{list(question)} \\
\text{c3: Copropositional(qud-contrib(pre.private.ip0),pre.private.q0)}
\end{array}\right]
\end{array}\right]$$

Initiating Sentential Fragments

- Sentential Fragments can occur as initiating moves (i.e. without a prior linguistic antecedent or segment initially.). These seem to require a rather sterotypical interactional setting.

(19) a. Buying a train ticket:
Client: A return to Newcastle please. (=I want a return . . . , please give me a return . . . , . . .)
b. Driver to passenger in a taxi: Where to?

Initiating Move (reformulated)

Initiating Move:

$$\left[\begin{array}{l}
\text{pre}: \left[\begin{array}{l}
\text{dgb}: \left[\text{qud} = \langle\rangle\colon \text{eset(info-struc)}\right] \wedge \text{DGBType} \\
\text{private} = \left[\begin{array}{l}
\text{genre: GenreType} \\
\text{beliefs}: \text{Prop} \\
\text{agenda}: \text{list(IllocProp)} \\
\text{m0}: \text{locProp} \\
\text{q0}: \text{info-struc} \\
\text{c1}: \rightarrow(\text{beliefs}, \\
\qquad \text{GenreRelevant}^{qudpresupp}(\text{m0}^{cont}, \text{q0.q}, \text{dgb}, \text{genre}))
\end{array}\right] : \text{PRType}
\end{array}\right] \\
\text{effects}: \text{Turnholder-Underspec} \wedge_{merge} \\
\qquad \left[\begin{array}{l}
\text{LatestMove} = \text{pre.private.m0}: \text{LocProp} \\
\text{qud} = \left\langle \text{q0} \right\rangle\colon \text{list(info-struc)} \\
\text{c3: Copropositional(qud-contrib(m0.cont),q0.q)}
\end{array}\right]
\end{array}\right]$$

Initiating NSUs

- This formulation allows for initiating moves m0 relative to an incrementation of QUD by a question which is co-propositional with the content of m0.
- In particular, this allows for an analysis of (19a,b) as short answers and (19c) as a direct sluice.
- One subtle difference here is that that the notion of QUD accommodation employed here is not purely semantic, but also requires a specification of the categorial aspects of the FEC.

Initiating NSUs

- This allows us to capture linguistic restrictions on such uses such as the German and Hebrew examples in (20), where asking for a cup of coffee or loaf of bread is naturally done with an NSU bearing accusative case:

(20)

a.

A: et haxalla hazoti bevakasha.
defobj-marker the-Challah the-that please.
A: That Challah (Sabbath loaf) please

b.

A: Einen normalen Kaffee bitte.
A-masc-acc normal-masc-acc Coffee please.
A: A regular coffee please

Initiating NSUs

- This data can be accounted for by stipulating the category of the FEC for the issue that makes up the corresponding genre to be accusative.
- The empirical situation, however, is quite complex since conversations of this type can also involve NSUs with distinct case requirements. Although the definite accusative marker is obligatory for a definite object in a non-elliptical setting (as in (21a)), it could be omitted in (21b).
- (21c) a variant of (20a) with nominative case is also, apparently possible:

Initiating NSUs

(21)

a.

A: *ten li haxalla hazoti bevakasha.
Give-imp to-me the-Challah the-that please.
A: Give me please that Challah.

b.

A: haxalla hazoti bevakasha.
the-Challah the-that please.
A: That Challah please

c.

A: Ein normaler Kaffee bitte.
A-masc-nom normal-masc-nom Coffee please.
A: A regular coffee please

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Based on Ginzburg, Fernández, & Schlangen, 2007, 2012

Dysfluencies in Conversation

- Speech dysfluencies follow a fairly predictible pattern

until you're	*at the le-*	|| *I mean*	|| *at the right-hand*	*edge*
start	reparandum	moment of interruption	editing terms		alteration	continuation

Backwards looking dysfluencies

- Inspired by a similarly named distinction in the DAMSL annotation scheme (Core & Allen, 1997) , we distinguish between:
- *backward-looking* dysfluencies, as here the moment of interruption is followed by an alteration that refers back to an already uttered reparandum.

(22) a. Flights to Boston I mean to Denver. (Shriberg 1994)
b. Have you seen Mark's erm earphones? Headphones. (British National Corpus, file KP0, l. 369-370)
c. From yellow down to brown - no - that's red.
d. We go straight on, or– we enter via red, then go straight on to green. (From Levelt (1989))
e. Why it is – why is it that nobody makes a decent toilet seat? (From Fay (1980), cited by Levelt (1989))

Forwards looking dysfluencies

- *forward-looking* dysfluencies: dysfluencies where the moment of interruption is followed not by an alteration, but just by a completion of the utterance which is delayed by a filled or unfilled pause (hesitation) or a repetition of a previously uttered part of the utterance (repetitions).

(23) a. Show flights arriving in uh Boston. (Shriberg 1994)
b. And also the- the dog was old. (Besser and Alexandersson (2007))
c. A vertical line to a- to a black disk (From Levelt (1989))
d. Today was, {F uh, } definitely a shorts day around here.

Basic Explanatory strategies I

- **Dysfluencies are filtered out based on purely structural properties, before interpretation even starts.**
- **'direct revision'-approach**: any context-based interpretations that were built up for the repaired material are directly removed during the processing of the dysfluency.
- Our neo-CA Approach:
  - dysfluent material, although no longer active in content construction, still remains in context.
  - The revision effect (of repairs and elaborations) is actually caused by the meaning of the interruption, and is a discourse effect on a par with other, more typically described, discourse-level correction and elaboration moves.

Basic Explanatory strategies II

- Not difficult to find examples showing that some information in repaired material apparently enters the common ground:

(24) From Switchboard:
A: Because I, [[[any, + anyone,] + any friend,] + anyone] I give my number to is welcome to call me, / {C but } no one is just welcome to come by my house.

- Inference from 24: "*It's not just her friends that are welcome to call her when A gives them her number*".
- (25a) entails (25b) and defeasibly (25c), which in certain settings (e.g. legal), given sufficient data, can be useful.

Basic Explanatory strategies III

(25) a. [Peter was + well he was] fired. (From Heeman and Allen (1999):)
b. Andy was unsure about what he should say, after uttering 'was'.
c. Andy was unsure about how to describe what happened to Peter.

- Psycholinguistic evidence for latency of dysfluent material (Brennan & Schober, 2001; Ferreira & Bailey, 2004; Arnold, Kam, & Tanenhaus, 2007

From CRs to Dysfluency: informal sketch I

- To recap: the main idea underlying KOS' theory of CRs is that in the aftermath of an utterance *u* a variety of questions concerning *u* and definable from *u* and its grammatical type become available to the addressee of the utterance.
- These questions regulate the subject matter and ellipsis potential of CRs concerning *u* and generally have a short lifespan in context.
- Our claim is that a very similar account applies to dysfluencies. As the utterance unfolds incrementally there arise questions about what has happened so far (e.g. *what did the speaker mean with sub-utterance u1*?) or what is still to come (e.g. *what word does the speaker mean to utter after sub-utterance u2*?).

From CRs to Dysfluency: informal sketch II

By making this assumption we obtain a number of pleasing consequences. We can:

- **explain similarities to other-corrections**: the same mechanism is at work, differentiated only by the QUDs that get accommodated.
- **explain how the other can take over & do the second part of the dysfluency**: if 'what did A want to say' / 'what does A want to say next' is indeed a question under discussion, then it should in principle also be possible for the interpreter to address that.

From CRs to Dysfluency: informal sketch III

- **appropriateness changes implicate that original use unreasonable**: examples like 26 involve quantity implicatures. These can be explicated based on reasoning such as the following: *I could have said (reperandum), but on reflection I said (alteration), which differs only in filtering away the requisite entailment.*

(26) it's (the f- + a front) leg [implic: no unique front leg]

Extending KoS to self-repair: first move

- Extend PENDING to incorporate utterances that are *in progress*, and hence, incompletely specified semantically and phonologically.
- Conceptually–natural.
- Significant step—presupposes the use of types that characterize utterances word by word (or minimally constituent by constituent), as e.g. in Combinatory Categorial Grammar, Type Logical Grammar, Dynamic Syntax, PTT or by abstraction from a 'standard' grammar (as e.g. in HPSG$_{TTR}$)
- A variety of issues we ignore: monotonicity, nature of incremental denotations etc.

Backwards Looking Dysfluencies (BLDs)

- BLDs we assume are possible essentially at any point where there is 'correctable material'.
- Technically this amounts to PENDING not being empty. We assume that editing phrases are, in some cases, content-ful constituents of the repair.
- The UR we posit for BLDs is this: given that u0 is a constituent of A's utterance in MaxPending, it is possible for A to accommodate as MaxQUD the following InfoStruc: the issue is 'what did A mean by u0', whereas the FEC is *u*0; the follow up utterance needs to be be co-propositional with MaxQud.

Backwards Looking Dysfluencies (BLDs)

Backwards looking appropriateness repair:

$$\begin{bmatrix}
\text{pre} : & \begin{bmatrix} \text{spkr} : \text{Ind} \\ \text{addr} : \text{Ind} \\ \text{pending} = \langle \text{p0}, \text{rest} \rangle : \text{list(LocProp)} \\ \text{u0} : \text{LocProp} \\ \text{c1: member(u0, p0.sit.constits)} \end{bmatrix} \\
\text{effects} : & \text{TurnUnderspec} \wedge_{merge} \\
& \begin{bmatrix} \text{MaxQud} = \\ \begin{bmatrix} \text{q} = \lambda x \ \text{Mean(pre.spkr,pre.u0,x)} \\ \text{fec} = \text{u0} \end{bmatrix} : \text{InfoStruc} \\ \text{LatestMove} : \text{LocProp} \\ \text{c2: CoPropositional(LatestMove}^{content}\text{,MaxQud)} \end{bmatrix}
\end{bmatrix}$$

Backwards Looking Dysfluencies: examples

(27) a. From Shriberg (1994):
Flights to Boston I mean to Denver.

b. From BNC KP0 369-370: Have you seen Mark's erm earphones? Headphones.

- in 27a the alteration 'I mean to Denver' provides a direct answer to the issue *what did A mean with the utterance 'to Boston'*;
- in 27b we analyze 'headphones' as a bare fragment ('short answer') which gets the reading 'I mean headphones' given the QUD-maximality of the issue *what did A mean with the utterance 'earphones'*.

Backwards Looking Dysfluencies: one more example

28) a. From Levelt (1989):
From yellow down to brown - no - that's red.

- Whereas 'I mean' is naturally viewed as a syntactic constituent of the alteration, 'no' cannot be so analyzed.
- This use of 'no' involves the expression of a negative attitude towards an event.
- Allows 'no' to be used to express a negative attitude towards an unintended utterance event.
- We could analyze 28a as involving the utterance 'brown'. Following this, the BLD rule is triggered with the specification QUD.q = what did A mean by FEC? and the FEC = 'brown.' The analysis then proceeds like the earlier cases.

Outline

NSUs

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Dysfluencies

Course Summary
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Why Type Theory with Records: grammar and interaction I

- By revisiting the Printer Example

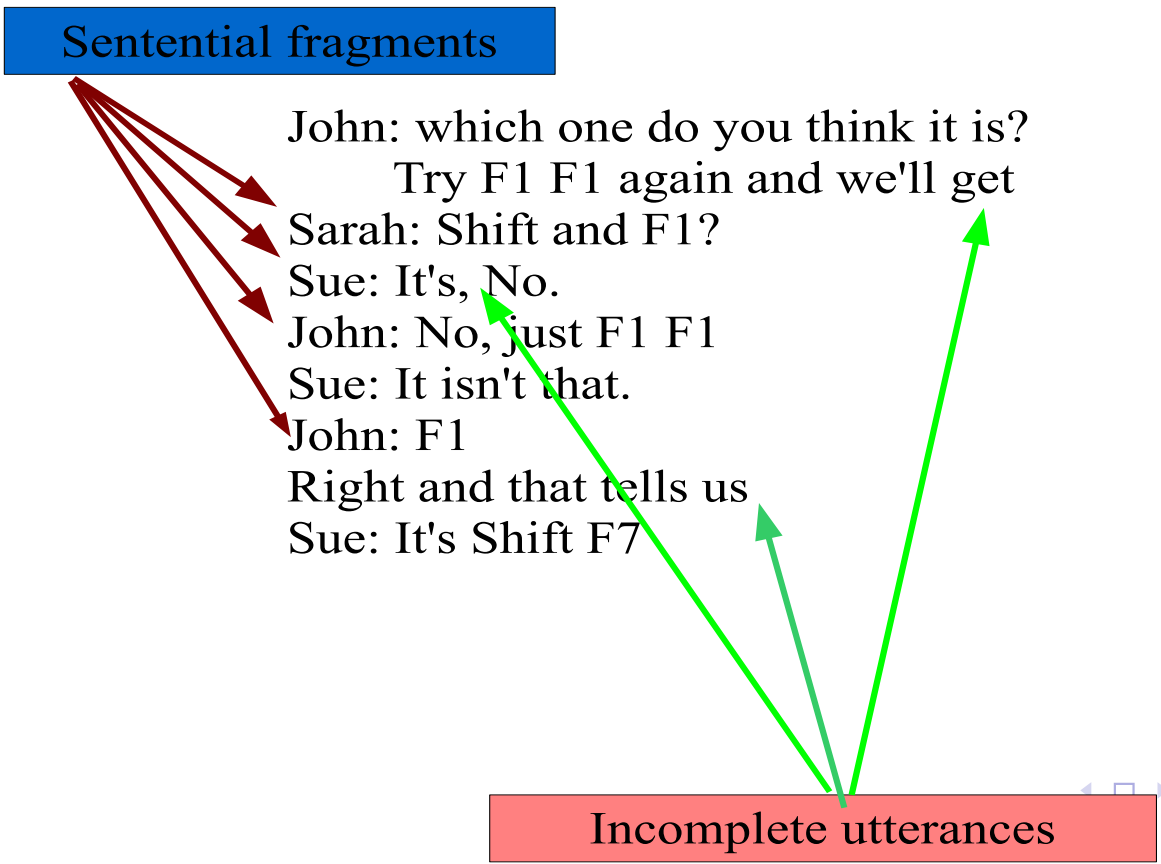
3 People trying to print a file (ca. 1990)

John: Okay which one do you think it is?
Try F1 F1 again and we'll get
Sarah: Shift and F1?
Sue: It's, no.
John: No, just F1 F1.
Sue: It isn't that.
John: F1.
Right, and that tells us
Sue: It's shift F7.

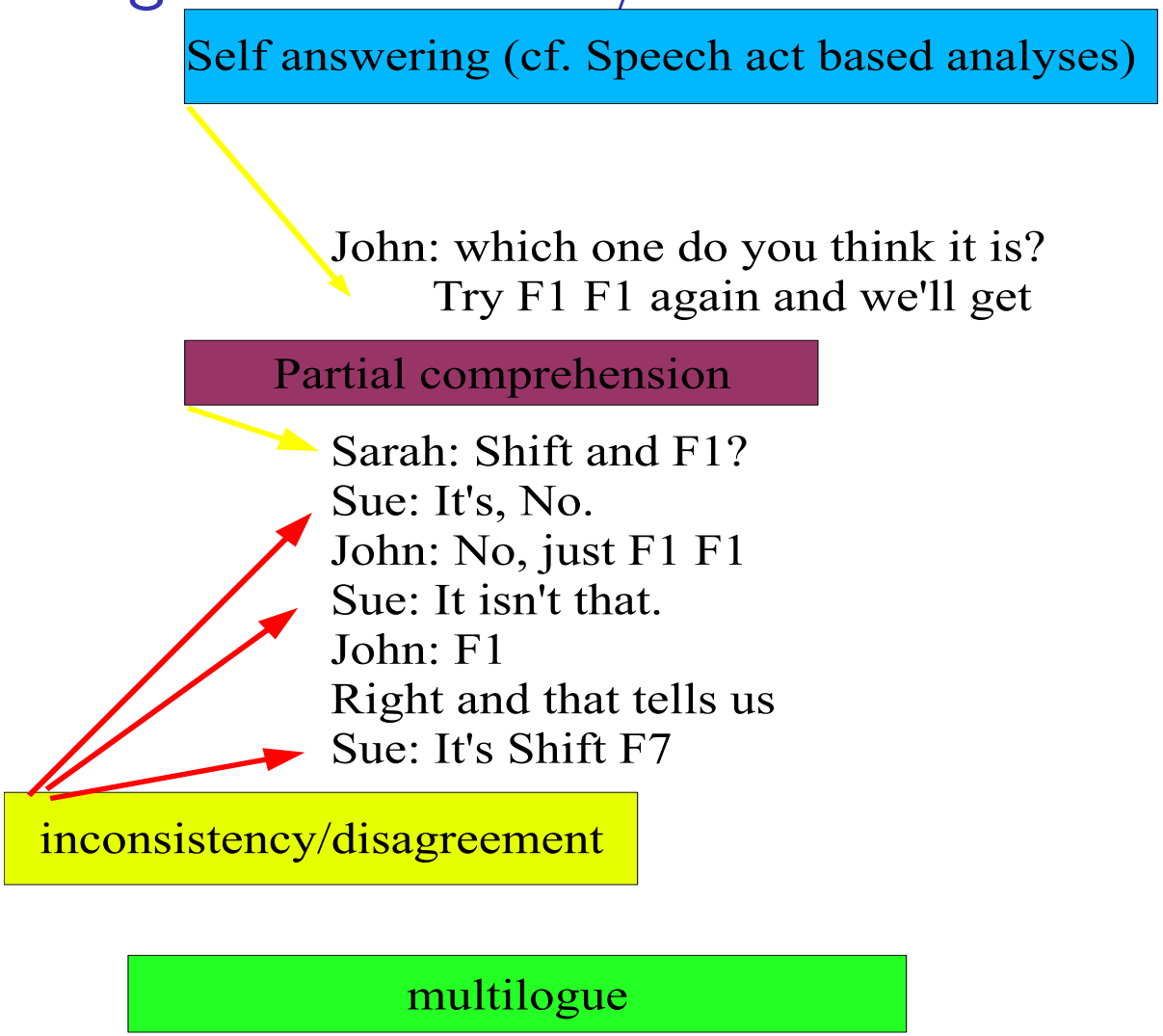
(from the British National Corpus)

Fragments in conversation: frequency

- Distinguishing characteristic of spoken language—high frequency of *fragments*



Challenges to semantic/discourse theories



Analyzing the printer example

- NSUs: using DGB-driven context.
- Dysfluencies using conversation rules of similar form to CRs and, more generally, to general conversational rules; requires incremental perspective for grammar.
- Self answering: consequence of QSPEC—factoring turn taking from general illocutionary specification.
- Misunderstanding: accommodated by (i) different DGBs per conversational participants, (ii) grounding/CR conditions characterized by locutionary propositions (utterance types/tokens)
- Multilogue involves scaling up of duologue conversational rules; main differences: communal grounding/acceptance, turn taking,.... (See Ginzburg & Fernández, 2005; Ginzburg, 2012)

Why Type Theory with Records: Semantic ontology I

- Possible worlds semantics has intrinsic problems, ones Montague was aware of when he first used it in his seminal papers in the 1970s.
- We saw how TTR provides an ontology which can be used to solve doxastic puzzles (propositions) and dialogical puzzles (negation).

Why Type Theory with Records: Syntax Semantics interface I

- We saw how TTR allows one to synthesize λ-calculus driven and unification–based synsem interfaces:
- Robust meaning/context/content relations
- GQs
- Questions
- Utterance types (for metacommunicative interaction)
- Frames (for detailed lexical semantics)

Many Thanks

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