Situations et Perspectives:
Langues orales, langues signées

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Semantics

Formal Semantics: what are the rules by which meaning is computed?
(i) study natural languages with same rigor as if it were a formal language (Richard Montague);
(ii) but be open to the possibility that its formal properties are very different from those of formal systems we know.

Comparative Semantics: what is the extent of language variation in the domain of meaning?
(i) initial studies of meaning were based on English and other western languages;
(ii) contemporary studies are intrinsically comparative.
Goal: we will suggest that sign language can bring important new insights into the foundations of semantics.
Linguistics and Sign Language

- Sign languages have been used to inform theories of morphology, syntax and even phonology. (e.g. Sandler and Lillo-Martin 2006 for a recent survey)

- Within the study of meaning, the main question that has been asked concerns the status of iconicity, which plays an important role in sign languages. (e.g. Cuxac 1993 Liddell 2003)

- Can sign language provide new evidence about the formal rules by which meaning is computed?
  1. What is the logic of natural language?
  2. What are the ontological commitments of natural language: objects? times? worlds?
  3. How does language manipulate perspectives?
The Importance of Pronouns

- Pronouns express **logical dependencies**
  
  Every politician$_1$ knows someone who will betray him$_1$.
  Chaque politicien$_1$ connaît quelqu’un qui le$_1$ trahira.
  $\forall x_1 [\text{politician}(x_1) \Rightarrow \exists x_2 (\text{person}(x_2) \land \text{trust}(x_1, x_2) \land \text{will-betray}(x_2, x_1))$.
  ✨ What is the **logic** of natural language?

- Pronouns are a marker of **ontological commitment**
  
  Quine: ‘To be is to be the value of a variable...’
  ✨ Does language have means of **reference to times/worlds**?

- Pronouns are an indicator of **perspectival orientation**
  
  I is an indicator of first person perspective. But in reported speech there is a conflict between the speaker’s perspective and the subject’s perspective (e.g. *Sam says that I am wrong*).
  ✨ How is the first person perspective conveyed in **reports**?
Sign Languages
Sign Languages:
Hungarian and International Sign Language

Ádám Kósa, 1st Deaf member of the European Parliament. Hungarian Sign Language with simultaneous interpretation in International SL
Deaf Liberation:
Gallaudet University and its first Deaf President

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Sign vs. Spoken Language

■ Linguistics
Comparison between sign language and spoken languages is ongoing, and has unearthed significant similarities (e.g. Sandler and Lillo-Martin 2006).

■ Neuroimaging and Lesion studies
“Overwhelmingly, lesion and neuroimaging studies indicate that the neural systems supporting signed and spoken language are very similar:
both involve a predominantly left-lateralised perisylvian network. Recent studies have also highlighted processing differences between languages in these different modalities.” (MacSweeney et al. 2008)
(i) Regions activated by BSL sentence comprehension in deaf native signers. (ii) Regions activated by audio-visual English sentence comprehension in hearing non-signers. Both language inputs were contrasted with a low-level baseline: perception of the still model and a low-level target detection task (visual for deaf; auditory for hearing). Source: MacSweeney et al. 2008, 2002.
Creating Sign Language: Nicaraguan Sign Language (Senghas et al. 2004)

- First generation of children created a language that 'pooled the makeshift gestures they used with their families at home'.

- Second generation of children, who acquired the language when they were four, acquired a different version of the language.

- An example: roll down
  => in this particular case, a more ‘iconic’ construction is partially replaced with a more ‘grammatical’ one (but iconicity is an important component of mature sign languages).
Rolling down

Spanish Speaker
Spanish speaker describing an event in which a cat, having swallowed a bowling ball, proceeds rapidly down a steep street in a wobbling, rolling manner. Here, manner (wiggling) and path (trajectory to the speaker’s right) are expressed in a single movement.

NSL Signer, learned after 1993
and before the age of 6. Manner and path expressed sequentially. Here, manner (circling) and path (trajectory to signer’s right) are expressed in two separate signs, assembled into a sequence.
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Pronouns
Formal Properties of Pronouns: Spoken Language

- **Ambiguities without ellipsis**
  Sarkozy\(_1\) told Obama\(_2\) that he\(_1?/2?\) would be elected.

- **Ambiguities with ellipsis**
  Peter\(_1\) loves his\(_1\) wife. John\(_2\) does too __.
  Meaning 1: ... loves Peter’s wife.
  Meaning 2: ... loves John’s wife.

- **‘Condition B’**
  a. *John\(_1\) likes him\(_1\)
  b. John\(_1\) likes himself

- **Other Properties**
  Weak Crossover, Strong Crossover...
The Signer’s Space

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Sign Language Pronouns as Indices
(Lillo-Martin and Klima 1990)

- **English**
  a. Sarkozy<sub>1</sub> told Obama<sub>2</sub> that he<sub>1? / 2?</sub>’d win the election.
  b. A deputy<sub>1</sub> told a senator<sub>2</sub> that he<sub>1? / 2?</sub>’d win the election.

- **LSF** (Informant F, 4, 235)

  \[ \text{SARKOZY}_a \text{ OBAMA}_b \text{ a b a-TELL-b IX-b WIN ELECT}^N \]

  \[ \text{SARKOZY}_a \text{ OBAMA}_b \text{ a b a-TELL-b IX-a WIN ELECT}^N \]
[Sign Language Pronouns as Indices]
(Lillo-Martin and Klima 1990)

- **English**
  a. Sarkozy₁ told Obama₂ that he₁?₁/₂?₁’d win the election.
  b. A deputy₁ told a senator₂ that he₁?₁/₂?₁’d win the election.

- **LSF** (Informant F, 4, 233)

  DEPUTYₐ SENATORᵦ b a-TELL-b IX-b WIN ELECTᴺ

  DEPUTYₐ SENATORᵦ b a-TELL-b IX-a WIN ELECTᴺ
[Sign Language Pronouns as Indices]
(Lillo-Martin and Klima 1990)

- **English**
  I have two tickets. If I give them to John₁ and Bill₂, they₁+₂ will be happy.

- **ASL** (Informant 1, 2, 180)

  IX-1 HAVE TWO TICKET.

  IF 1-GIVE JOHNₐ BILL, THE-TWO-a,b HAPPY.
Present Elicitation Method

- Work with native signers of ASL and LS
- All examples are videotaped.
- Playback method

Stage 1: One signer signs sentences of interest.

Stage 2: One or several signers assess these sentences for acceptability (usually by comparing several sentences).

- Often, ratings on a 7-point scale.
<table>
<thead>
<tr>
<th></th>
<th><strong>English</strong></th>
<th><strong>Sign Languages</strong></th>
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<tbody>
<tr>
<td><strong>Ambiguity w/o ellipsis</strong></td>
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<td>*John$_1$ admires him$_1$ John$_1$ admires himself$_1$</td>
<td>ASL: Yes (but...)</td>
</tr>
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<td></td>
<td></td>
<td>LSF: Yes (but...)</td>
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<tr>
<td><strong>Weak/Strong Crossover</strong></td>
<td>??Who$_1$ do his$_1$ students like?</td>
<td>ASL: Yes (but...)</td>
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<td></td>
<td></td>
<td>LSF: ?</td>
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Suppose we find an apparent difference between a Sign Language and English. What can we conclude from this?

- **Possibility 1:** Real difference that could be replicated among spoken languages, and is not due to modality.
- **Possibility 2:** Real difference that is due to the difference in modality.
- **Possibility 3:** Superficial difference: the difference in modality only makes visible in one case structures that are abstract in the other.
A Difference: Locative Agreement

- When several geographical locations are associated to a single individual, the *locations’ loci* can serve to refer to the individual.

- Locative Agreement in ASL

  \[ \text{JOHN}_b \text{a}[\text{WORK IX-a}_a \text{ FRENCH CITY}] \text{ SAME}_c[\text{WORK IX-c} \text{ AMERICAN CITY}]. \]

  \[ \text{IX-a IX-1 HELP IX-a, IX-c IX-1 NOT HELP IX-c} \]

Logic:

How are pronouns connected to their antecedents?

Scope in Logic and in Language (= ‘portée’)

- In logic, a variable cannot depend on a quantifier unless it is within its syntactic ‘scope’.
  a. \( \exists x \ (P(x) \& Q(x)) \) \( Q(x) \) is in the scope of \( \exists x \)
  b. \( \exists x \ P(x) \ldots Q(x) \) \( Q(x) \) is NOT in the scope of \( \exists x \)

- In language, a similar notion has been devised under a different name (‘c-command’).
  a. [No politician]_1 works with people who criticize him_1.
  b. #[No politician]_1 works. People criticize him_1.

\[ \Rightarrow \] him is in the scope of no politician in a. but not in b.
A Problem
(Geach 1962)

a. \(\#[\text{No Frenchman}]_1\) won the Tour de France. He\(_1\) was praised.

b. [A Frenchman]\(_1\) won the Tour de France. He\(_1\) was praised.

Problem
Pronouns can depend on indefinites without being in their syntactic scope.
**Scope ("Portée") in Predicate Logic**

*Qx* is in the scope of *∃x* on the left but not on the right.

**Diagram:**

- **a.** *∃x (Px & Qx)*
  - Scope of *∃x*
  - *Px & Qx*

- **b.** *((∃x Px) & Qx)*
  - Scope of *∃x*
  - *Px & Qx*
Scope (= c-command) in Natural Language

*he* is in the scope of *no man* on the left but not on the right.
[A Problem]

- **A difference:** A pronoun can depend on an indefinite **without** being in its scope.
Dynamic Semantics vs. Classical Semantics

- **Theory I.** Dynamic logic + pronouns as variables
  
  **Intuition:** Indefinites introduce ‘discourse referents’
  
  (Kamp 1981, Heim 1982)
  
  => a new kind of logic, ‘dynamic logic’, is needed (variables can depend on existential quantifiers without being in their scope).

- **Theory II.** Classical logic + pronouns as descriptions
  
  (Evans 1977)
  
  **Intuition:** Pronouns are concealed definite descriptions – e.g. he = the Frenchman (who won the Tour de France)
  
  => no new logic is needed.
Arguments

- **Dynamic Semantics is often considered ‘intuitive’**
  ... and it does not have to posit ‘concealed’ linguistic material.

- **But there might be independent arguments for the ‘pronouns as descriptions’ view**

  a. Either this house has **no bathroom** or **it** is well hidden.
     (after B. Partee)
     \[\text{it} \sim \text{the bathroom}\]

  b. I doubt that this house has **no bathroom** – but **it** must be well hidden.
     \[\text{it} \sim \text{the bathroom}\]
Sign Language Data

- **LSF**
  IX-b GERMAN_b GERMAN_a a,b-MEET.
  IX-b IX-a KNOW LONG-TIME.
  ‘A German met a German. He had long known him.’ (Inf E, 13, 14-15)

- **Dynamic Semantics: appropriate analysis**
  a. The antecedents each introduces a position.
  b. Pronouns retrieve this position by way of pointing.
  c. Thus there is a formal and visible connection between an indefinite and a pronoun in another sentence.

- **Pronouns as descriptions: difficulty even in English**
  A German and a German met. The German knew the German...? The German who met a German knew the German who a German met?
[Sign Language Data]

- **ASL**
  WHEN \_a\_ONE a-MEET-b \_b\_ONE...
  a. **IX-a** TELL **IX-b** HAPPY a-MEET-b (Inf 1, 2, 285; 111)
  b. **IX-b** TELL **IX-a** HAPPY a-MEET-b (Inf 1, 2, 285; 111)

- **Dynamic Semantics: appropriate analysis**
  a. The antecedent introduces a position in signing space.
  b. Pronouns retrieves this position by way of pointing.
  c. Thus **there is a formal and visible connection between an indefinite and a pronoun outside its scope.**

- **Pronouns as descriptions: difficulty even in English**
  When someone meets someone, **the person** tells **the person**...?
  **the person** that **meets a person** tells **the person** that **a person** meets...
  ...?
Sign Language Data

**English**

a. Either this house has no bathroom or [it] is well hidden.
b. I doubt that this house has no bathroom – but [it] must be well hidden.

**ASL**

a. EITHER NO a ONE WILL GO MARS, EITHER-OR
   IX-a WILL FAMOUS
   ‘No one will go to Mars, or he [= the person who goes to Mars] will be famous.’ (Inf 1, i P1040984; i P1040985)

b. IX-1 DOUBT NO a ONE WILL GO M.A.R.S.
   IX-a WILL FAMOUS.
   ‘I don’t think no one will go to Mars. He [= the person who goes to Mars] will be famous.’ (Inf 1, i, P1040980; i, P1040981)
Conclusion on Logic

- ASL (and LSF) make(s) visible a formal connection between an antecedent and a pronoun which is not within its scope.

- This provides evidence for the analysis offered by Dynamic Semantics.

- We also obtain unexpected new data: in ASL, under restricted conditions, all sorts of antecedents (including ‘no one’) can introduce ‘discourse referents’.
Ontology:

Does language have grammatical means of reference to times and possible worlds?

Temporal and Modal Talk

- **Beyond the Here and Now**
  “Man is apparently almost unique in being able to talk about things that are remote in space or time (or both) from where the talking goes on.” (Hockett 1960)

- **Temporal Talk**
  Sam will visit Paris
  $\approx$ at some future time, Sam visits Paris

- **Modal Talk**
  Sam must be in Paris
  $\approx$ in every world compatible with what we know, Sam is in Paris
Explicit vs. Implicit Reference to Times/Worlds

- **Theory I. Temporal and Modal Logic**
  **Intuition:** The grammatical resources we have to talk about situations (times and possible words) are less rich than those we have to talk about individuals.
  $\Rightarrow$ we explicitly refer to individuals (with pronouns), but not to times and possible worlds.

- **Theory II. Temporal and Modal Anaphora**
  **Intuition:** There are time- and world-denoting pronominal expressions (B. Partee, M. Stone)
Deictic Uses of Tense and Mood

- **Nominal Anaphora**
  [In a seminar:]
  He talks too fast.
  => the person made salient by the situation talks too fast.

- **Temporal Anaphora** (after B. Partee)
  [Watching a picture:]
  I wasn’t young
  => at the time made salient by the situation I wasn’t young.

- **Modal Anaphora** (after M. Stone)
  [There is a party at my place, and one of the guests comes near the stereo to turn up the volume.]
  No! My neighbors would kill me.
  => in the worlds made salient, my neighbors kill me.
Anaphoric Uses of Tense and Mood

- **Nominal Anaphora**
  A Frenchman won the Tour de France. He was praised
  => The Frenchman who won the Tour de France was praised

- **Temporal Anaphora** (after B. Partee)
  Mary woke up sometime during the night. She was nervous.
  => Mary was nervous at the time at which she woke up.

- **Modal Anaphora** (after M. Stone)
  I could be a millionaire. But I **would** pay taxes.
  => I would pay taxes in the worlds in which I am a millionaire.
Temporal and Modal Talk in ASL

**Temporal**

*Context*: Every year there are flu outbreaks.

```
IX-1 SOMETIMES INFECTED \[a\]. \textbf{IX-a IX-1 PROBLEM.}
```

Rating (7 = best): 6.7

‘Sometimes I get infected. Then I have a problem.’

‘When does the speaker have a problem? When infected.’

**[Modal]**

```
FLU OUTBREAK. IX-1 POSSIBLE INFECTED \[a\]. \textbf{IX-a IX-1 PROBLEM.}
```

Rating (7 = best): 6.3

‘There was a flu outbreak. I might be infected. Then I have a problem.’

‘In what case does the speaker have a problem? If infected.’
Temporal and Modal Talk in ASL

- It is possible to **point towards positions** assigned to individuals as well as situations (times and worlds).

- The **same dual / trial / plural pronouns** can be used to refer to individuals and situations (times and worlds).

- **A new fact**
  Temporal and modal pointing gives rise to the **same patterns of agreement** as locative pointing.
Temporal Agreement

Temporal Agreement in ASL

Context: John is retired.

\[\text{JOHN IX-b} \text{ a[PAST COLLEGE STUDENT CL]} \text{ c[PAST COLLEGE PROFESSOR CL]}.\]

| IX-a IX-1 HELP IX-a, IX-c IX-1 NOT HELP IX-c |

‘At some point John was a college student and at some point he was a university professor. Then [=when he was a student] I helped him. Then [= when he was a professor] I didn’t help him.’
Temporal

Context: Every year, the speaker plays in the lottery.

SOMETIMES IX-1 VERY LUCKY_1. SOMETIMES LITTLE-BIT LUCKY_2. NO-MATTER THE-TWO-a, b IX-1 HAPPY.

Rating (7 = best): 6.5

‘Sometimes I am very lucky. Sometimes I am a little lucky. In both cases, I am happy.’
[Temporal and Modal Talk in ASL]

- **Modal**

*Context:* The speaker is playing in a lottery, and he believes he has won.

NOW IX-1 POSSIBLE VERY RICH\textsubscript{a}. POSSIBLE LITTLE-BIT RICH\textsubscript{b}. NO-MATTER THE-TWO\textsubscript{a}, \textsubscript{b} IX-1 LUCKY.

Rating (7 = best): 6.5

‘Now I might be rich, and I might a little rich. In both cases I am lucky.’
Modal Agreement in ASL

**Context:** I don’t know who John is.

JOHN IX-ba [POSSIBLE COLLEGE STUDENT CL] e [POSSIBLE COLLEGE PROFESSOR CL].
re__ re__
IX-a IX-1 HELP IX-a, IX-c IX-1 NOT HELP IX-c

‘It’s possible that John is a college student and it’s possible that he is a university professor. Then [= if he is a student] I will help him. Then [= if he is a professor] I won’t help him.’
Conclusion on Ontology

- ASL makes visible a temporal and modal reference.

- This provides evidence for the view that language has situation-denoting pronominals.

- We also obtain unexpected new data: in ASL, temporal and modal reference seems to be particularly similar to locative reference.
Perspectives:

How is the first person perspective conveyed in indirect discourse?
The Standard Analysis: Fixed Context  
(Kaplan 1977)

- ‘I’ vs. ‘the speaker’
  a. The speaker always sounds stupid.
  b. ≠ I always sound stupid.
  I can only refer to the speaker of the actual context; the speaker can refer to the speaker of other situations.

- Reported speech
  a. Sam says: ‘I am an idiot’.
  b. ≠ Sam says that I am an idiot.

- Quotations block grammatical dependencies
  a. *Who did Sam say ‘I like _’?
  b. *Qui est-ce que Sam a dit ‘j’aime_’?
The first person perspective can be crucial...

- **Situation:** There is a signing competition. Ann is watching her own hands without realizing it.

  She will win!
...but it is apparently lost in indirect discourse.

Ann thinks: 'I will win'  \( (True) \)

\[ \Rightarrow \]

Ann\(_i\) thinks that she\(_i\) will win.

Ann thinks: 'She will win'  \( (True) \)

(where 'he' refers to Ann)

Apparently, there is information loss in indirect discourse: information about the first vs. third person perspective is not preserved.
Context Shift

- **Theory I. No Context Shift** (Kaplan 1977)
  
  **Intuition:** The only context that plays a grammatical role is the context of the actual speech act.

  Only option:  
  c Sam says that  I_c am an idiot

- **Theory II. Context Shift** (Schlenker 2003)
  
  **Intuition:** Indirect discourse sometimes makes it possible to ‘shift the context’ and thus adopt another thinking agent’s perspective.

  => some of these cases do not involve quotation.

  Two options: 
  c Sam says that  I-c am an idiot
  c Sam says that  c’ I-c’ am an idiot
Regaining the first person perspective

a. True: Ann hopes that she will win.

b. False: Ann hopes to win

a. is ambiguous, but b. only reports 1st person thought

She should win!
Shifting the Context Without Quotation

- **First person in Amharic** (Schlenker 2003)
  
  \[ \text{jon} \quad \text{jēgna nə-ñana} \quad \text{yīl-all} \]
  \[ \text{John hero} \quad \text{be Pf-ISO 3M say-AUX 3M} \]
  ‘John says that he is a hero’

- **Present tense in Russian** (Schlenker 2003)
  
  \[ \text{petjä } \text{skazal, } \text{čto } \text{on } \text{plačet} \quad \text{[Russian]} \]
  \[ \text{Pejta } \text{said } \text{that } \text{he } \text{is-crying} \]
  ‘Petja said that he was crying [at the time of his utterance]’

- **First Person in Zazaki** (Anand 2006)
  
  \[ \text{čèneke } [\text{ke } \text{Hesen } \text{va } \text{mī } \text{t } \text{pac } \text{kēr } \text{da}] \text{ rindeka girl that Hesen said } \text{I } \text{t } \text{kiss } \text{did } \text{pretty. be-PRES} \]
  ‘The girl that Hesen said {Hesen, I} kissed is pretty.’ (Ar
‘Role Shift’ in ASL (= ‘transfert’)

- **No Role Shift** (Informant 1, 2, 49)

  \[ a \text{PETER TELL } b \text{ANN } a \text{-GIVE- } b \text{CAR.} \]
  ‘Peter told Ann that he would give her a car’

- **Role Shift** (Informant 1, 2, 49)

  \[ RS_a \]

  \[ a \text{PETER TELL } b \text{ANN } 1 \text{-GIVE-2 } \text{CAR.} \]
  ‘Peter told Ann that he would give her a car

- ... and it can be shown with standard tests (= grammatical dependencies) that **Role Shift isn’t standard quotation.**
[Role Shift ≠ Standard Quotation]

■ Role Shift in Indirect Discourse (ASL)

Context: the speaker is in NYC

\[ \text{RS}_a \]

\text{IN LA WHO IX-a JOHN}_a \text{ SAY IX-1 WILL MEET __ HERE WHO}

‘In LA, who did John say he would meet there [in LA]’?

\text{IX-1 = JOHN}
\text{HERE = LA}
Role Shift Without Indirect Discourse

- **Role Shift without Indirect Discourse (ASL)**

  LAST-WEEK 1X-1 I-MEET PETER$_a$ IN LA$_b$.

  RS___________
  1X-a 1-FIGHT-FIGHT PEOPLE.

  ‘Last week I met Peter in LA. He fought with people.’

  (Inf 1, 6, 429-430)
Conclusion on Perspectives

- ASL makes visible an operation of ‘context shift’ which was postulated for indirect reasons for some spoken languages (e.g. Zazaki).

- This provides evidence for the view that language has a grammatical operation of context shift.

- We also obtain unexpected new data: in ASL, context shift can arise outside of indirect discourse.
Comparative Formal Semantics

I. Logic: variables (pronouns) can depend on antecedents without being in their syntactic scope => *dynamic logic*.

II. Ontology: language has *situation-denoting pronominals* (time and possible worlds).

III. Perspectives: *context-shifting constructions*

Sign Language

a. ASL and LSF sometimes provide *visible evidence* for semantic operations which are harder to observe in spoken language (antecedence, reference, context shift).

b. They also provide *unexpected new data and problems*.

Comparative semantics should study *sign language*; and researchers who are native signers should play a crucial role.