THE MEANINGS OF SENTENCES
• Philosophical contemplation
  • Worlds, situations, and the meanings of sentences

• Negative polarity items and downward entailment

• The meanings of infinitives and how that relates to structure
Referential

- Sentence meanings are abstract “objects.”

- Two kinds of abstract objects
  - *Russellian proposition* $<x, y>$: an ordered pair consisting of $x$ and the property $y$
    - NOTE: It’s easy to think of sentences with the copula or attitudinal verbs (think, feel, believe, expect) in this way. Less so with lots of other verbs.
  - *Possible worlds*: include modality (necessity, possibility, contingency).

Elizabeth II is wise.
$<$Elizabeth II, wisdom$>$
- Sets are abstract objects

“If there is one object that is the meaning of an uttered sentence, this seems to provide a better foundation for successful communication than the situation that the internalist alternative would envisage…” [p.44]
Sentence 1: “Harold believes that there is life on Venus, and Fiona does too.”

Sentence 2: “There is something they both believe – to wit, that there is life on Venus.”

- Based on Sentence 1, we can deduce the truth of Sentence 2.
- There is an object that Harold and Fiona have a belief relationship to.
- That abstract object is the proposition that there is life on Venus.
FROM AN INTERNALIST PERSPECTIVE...

- Sentence meanings are internal mental structures.

- “There is something they both believe” is ambiguous in the same way that “There is something they both own” is ambiguous.

- If they both own houses, this doesn’t necessarily mean they own the same house.
Possible Worlds (David Lewis)

- Meanings of sentences are sets of possible worlds.
  - If you know the meaning of a sentence, then you know the conditions that must hold in order for the sentence to be true.

- Some sentences are necessarily true—i.e., true in every possible world
  - *Two plus three equals five* and *Three plus four equals seven* are both true in every possible world. The meaning of each sentence is the set of all possible worlds.
    - In essence, these two sentences have the same meanings.
  - *Two plus three equals six* and *Three plus four equals eight* aren’t true in any possible world.
    - These two sentences have the same meaning

- Not intuitive…

- Enter situations…
A minimal situation in which some condition holds contains:
- Just enough entities, properties, and relations to make that condition hold.

A minimal situation in which *Two plus three equals five* is distinct from a minimal situation in which *Three plus four equals seven*.
- These two sentences do not have the same meaning because they don’t have the same set of situations.

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Barwise and Perry: Sentence meanings are sets of possible situations.
Two sentences that are true in the same set of possible worlds can be true in different sets of situations.

Necessary falsehoods: No possible situation in which some proposition is true.

- No situation in which *Two plus three equals six* is true.
- BUT, the set of situations in which *Two plus three equals six* or *Three plus four equals eight* are distinct.

SO…situations can be impossible.
The permissibility of certain words/phrases depends on the presence of other words/phrases.

Suggests that we’re evaluating sets of possible worlds (which are sets of situations).
(1) a. Richard had **not** met *any* classicists.
   b. *Richard had met *any* classicists.
(2) a. Richard had met many classicists
   b. Richard had not met many classicists.

(3) a. Henry **did not** discuss the bacchanal *at all*.
   b. *Henry discussed the bacchanal *at all*.
(4) a. Henry **did not ever** discuss the bacchanal.
   b. *Henry ever discussed the bacchanal.
(5) a. Henry **has not** discussed the bacchanal *yet*.
   b. *Henry has discussed the bacchanal *yet*.
(6) a. Henry **did not** *lift a finger* to prevent Cloke being incriminated.
   b. *Henry *lifted a finger* to prevent Cloke being incriminated.

**NEGATIVE POLARITY ITEMS**

- *Any, at all, yet, lift a finger are negative polarity items (NPIs).*
- *Not is an NPI licensor.*
NPI licensors are downward entailing.

If one sentence entails the other, there is no possible world in which the first sentence is true and the second sentence is false.

a. **No** gods worry. No gods worry about income tax.

b. **At most** three gods worry. At most three gods worry about income tax.

c. Some gods worry. Some gods worry about income tax.

d. All gods worry. All gods worry about income tax.

- a/b are downward entailing.
- c/d aren’t downward entailing
- No gods show any mercy to mortals.
- At most three gods show any mercy to mortals.
- *Some gods show any mercy to mortals.
- *All gods show any mercy to mortals.

*Ladusaw’s Theory*
NPIs teach us that sentence meanings are sets of possible worlds and that some part of our brain is performing set theoretic calculations in order to evaluate sentence meanings.

[p.56]
INFinitives: A Union of Theta Theory, Syntax, and Semantics
Review of c-selection and s-selection
- *Deny, say, and wonder* all C(ategory)-select for an embedded clause.

- But have different S(emantic)-selection requirements.

  - *Deny* takes a propositional complement.
  - *Wonder* takes a question complement.
  - *Say* takes either a proposition or a question.

- a. Martha denied that John has left.
  a.’ *Martha denied whether John has left.

- b. Martha said that John has left.
  b.’ Martha said whether John has left.

- c. *Martha wonders that John has left.
  c.’ Martha wonders whether John has left.

  (Johnson 2011, Ch2, EX 143-144)

- *Some verbs c-select either a clause or an NP and both the clause and the NP have the same semantic properties.*

  a. John asked me what the time is/the time.
     Question

  b. I’ll assume (that) he’s intelligent/his intelligence.
     Proposition

  c. Bill couldn’t believe how hot it is/the heat.
     Exclamative

- *Other verbs s-select for the same thematic types as above, but c-select only clauses.*

  d. John wondered what the time was/*the time.
     Question

  e. I’ll pretend that he’s intelligent/*his intelligence.
     Proposition

  f. Bill complained how hot it was/*the heat.
     Exclamative

  (Johnson 2011, Ch2, EX 139)
**Raising:** the subject of the main clause is semantically related to the verb in the embedded clause, but not to the verb in the main clause.
- Verb in the main clause does not have a theta role for a subject.

**Control:** The subject/object of the main clause is semantically related to the verbs in both the main clause and the embedded clause.
- Both the main and embedded clause verbs have theta roles for subjects.

**Exceptional Case Marking** (ECM): the DP that “looks” like the object of the main clause is actually semantically related to the verb of the embedded clause.
- Both the main and embedded clause verbs have theta roles for subjects.
- There is debate about whether these are actually “raising to object.”

1. Barnett seemed to understand the formula. **Raising**
2. Barnett tried to understand the formula. **Subject Control**
3. Barnett persuaded the doctor to examine Tilman. **Object Control**
4. Barnett believed the doctor/her to have examined Tilman. **Exceptional Case Marking**
5. Barnett promised the doctor to examine Tilman. **Subject Control** (a special case)

[Davies and Dubinsky 2004, CH 1, EX 1-5]
CONTROL INFINITIVES AND EMBEDDED WH CLAUSES - GOOD

1. Sally told Jim how to eat chocolate.
2. Sally asked when to leave.
3. Sally decided when to leave.
4. Sally wondered what to eat.
5. Sally told Jim whether to eat chocolate.
6. Sally asked whether to leave.
7. Sally decided whether to leave.
8. Sally wondered whether to eat chocolate.

RAISING AND ECM INFINITIVES AND EMBEDDED WH CLAUSES - BAD

1. *John appears when to eat chocolate.
2. *John seems when to have left.
3. *John is likely how to dance.
4. *Jill believes when Sean to leave work.

[Johnson 2011, CH 3 EX 143-144]

Infinitival complements are not of the same category

[Johnson 2011, CH 3, EX 143-144]
TENSE, MEANING, AND THE CATEGORIES OF INFINITIVE CLAUSES
“It is true that to-infinitives lack the morphological feature [+Past], but this does not necessarily imply that they lack a tense operator…the tense of a to-infinitive is that of a possible future.” [Stowell 1982:562]

- Tensed complements, infinitives, and gerunds have different interpretations.
- In (1), the finite complements have their own tense specification.
  - (1a): The remembering is in the present and the visiting is in the unrealized future.
  - (1b): The wondering is in the present and the going is in the past.
  - (1c) is tricky. There is an infinitival complement inside the embedded finite clause.
    - We talked about [what we ought [PRO to do]].
    - The talking is in the past and the “ought to do” is in the unrealized future.
- In (2), the tense of the non-finite control clause is unrealized w.r.t. to the tense of the matrix clause.
  - In (2a)/(2b), the tense in the matrix clause is present. In (2c), the matrix tense is past.
- Both the embedded finite clause in (1) and the embedded control clause in (2) contain a WH.
  - The finite clause and the control clause are CPs.
- The gerunds in (3) are bad because they don’t have a CP projection to house the moved WH word. But why???

(1) a. I don’t remember who we should visit.
   b. I wonder where he went.
   c. We talked about what we ought to do.

(2) a. I don’t remember who to visit.
   b. I wonder where to go.
   c. We talked about what to do.

(3) a. *I don’t remember who (our) visiting.
   b. *I wonder where (his) going.
   c. *We talked about what doing.

The analysis in a nutshell: “…the Comp position is where tense operators must appear, at some level of grammatical representation.” (p.563)
- No *for* complementizer
  - I hoped for you to meet my parents.
  - *I hoped for your meeting my parents.
    - This is expected if gerunds do not have a CP projection.

- No WH movement
  - Relative clauses pattern like (3) on the previous slide.
  - WH movement is possible with finite (5a) and control relative clauses (5b), but not with gerunds (5c). **

- No tense specification of their own

  **Control – independent unrealized tense**
  - (8a): Jenny has not brought the wine at the point in time when she remembers to do so.
  - (9a): Jim does not succeed in locking the door when he tries to do so.

  **Gerunds – tense dependent on the matrix clause**
  - (8b): The bringing happened prior to the remembering, but both happened in the past.
  - (9b): The tense is ambiguous between present and unrealized w.r.t. the matrix.

Even though a gerund can have an unrealized tense, gerunds do not have an inherent "internally determined tense and therefore...its understood tense is determined externally by the semantics of the control verb." (p.563)
In the old days...
- S’ was analogous to CP
- S was analogous to TP
- [e] is an empty category – here, the complementizer

“There is no Comp position in a complement clause whenever the governing verb assigns Case to its subject.” (p. 565)

(11) is object control: case is assigned to the object by the matrix verb (or, in more contemporary terms, by the matrix ν)
- No case is assigned to PRO. CP (S’) blocks the relationship.

(12)/(13) are ECM: case assigned to the semantic subject of the embedded clause by the matrix verb
- No CP (S’) to block the relationship.

Back to tense: In ECM, the tense of the non-finite clause is dependent on the meaning of the matrix verb.
- Present in (12); Future in (13a); Past in (13b)
- In (11), each control infinitive has its own unrealized tense.
Hindi-Urdu is a split Ergative language. When the verb is in the perfective aspect (meaning that the action was necessarily completed), the subject is Ergative. Otherwise, it’s Nominative (or Dative).

Nominative and Accusative are not morphologically marked. Ergative is marked with the suffix –ne.

Participals and auxiliaries agree with the highest argument of the verb that is not overtly case-marked.

There’s agreement with the subject in (1) and agreement with the object in (2).

1. Rahul kitaab parh-taa thaa
   Rahul.masc. book.fem read-hab.masc.sg be.past.masc.sg
   ‘Rahul used to read (a/the) book.’

2. Rahul-ne kitaab parh-ii thii
   ‘Rahul had read the book.’
   
   Pfv = perfective aspect

[Bhatt 2005, EX 2]

In long distance agreement (LDA), the verb agrees with an argument that is not its own. A matrix verb agrees with an embedded object.

LDA can only occur in Hindi-Urdu if the matrix clause has an Ergative subject. If the matrix clause has a Nominative subject, the matrix verb has to agree with it (because the Nominative is the highest unmarked argument).

1. Verb in the main clause agrees with the subject in the main clause.

   Shahrukh [tehnii kaat-naa/*nii] chaah-taa thaa
   Shahrukh.masc branch.fem cut-inf.masc/*fem want-impfv.masc.sg be.past.masc.sg
   ‘Shahrukh wants to cut the branch.’

2. Main clause verb cannot agree with embedded object.

   *Shahrukh [tehnii kaat-naa] chaah-tii thii
   Shahrukh.masc branch.fem cut-inf.masc want-impfv.fem.sg be.past.fem.sg
   ‘Shahrukh wants to cut the branch.’ [Bhatt 2005, EX 7]

There’s not actually long-distance agreement here...
...but there is here.

- When there is an embedded infinitival clause and the subject in the main clause is ergative, the main clause verb *may* agree with the embedded object.
- When the main clause verb agrees, so does the infinitive. = 1
- When the main clause verb is in the default, so is the infinitive. = 2

1. Main clause verb and infinitive agree with embedded object
Shahrukh-ne [tehni kaat-nii/*naa] chaah-ii thii.
Shahrukh-erg branch.fem cut-inf.fem/*masc want-pfv.fem be.past.fem.sg
‘Shahrukh had wanted to cut the branch.’

2. Main clause verb and the infinitive are in the default
Shahrukh-ne [tehni kaat-naa/*nii] chaah-aa thaa.
Shahrukh-erg branch.fem cut-inf.masc/*fem want-pfv.masc.sg be.past.masc.sg
‘Shahrukh wanted to cut a/the branch.’

[Bhatt 2005, EX 6]
The proposal: In (1) on the previous slide, the infinitival complement is smaller than a full CP, so it's “permeable.”

The T in the matrix clause can cross into the embedded clause to establish a relationship with the embedded object, the consequence being that all verbs agree with the embedded object.

Shahrukh-ne [XP tehnii kaat-nii/*naa] chaah-ii thii.
Shahrukh-erg branch.fem cut-inf.fem/*masc want-pfv.fem be.past.fem.sg

‘Shahrukh had wanted to cut the branch.’

In (2), the embedded clause is a CP and this full clausal projection is not permeable. The matrix T cannot establish a relationship with the embedded object, and the consequence is that all verbs appear in the default form.

Shahrukh-ne [CP tehnii kaat-naa/*nii ] chaah-aa thaa.
Shahrukh-erg branch.fem cut-inf.masc/*fem want-pfv.masc.sg be.past.masc.sg

‘Shahrukh wanted to cut a/the branch.’

The verbs agree with no DP.

There is also a slight meaning difference. In the LDA construction, there is emphasis on the embedded object.

Big Picture: Having evidence for the idea that infinitives come in different “shapes” has lead to a broader application of that idea.
SUMMARY

• The interpretations of NPIs suggest that we are computing set-theoretic possible world scenarios.

• The typology of infinitives interacts with theta theory.

• The distribution of embedded WH words and complementizers, long-distance agreement phenomena, and the tense interpretations of different infinitives lead us to believe that some infinitives are full CPs and others are smaller.


