The Modularity of Meaning:

Is Meaning Dynamic?

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Static vs. Dynamic Semantics

Kamp 1981; Heim 1982, 1983

- **Static View:** **Semantics:** Truth conditions

  1970's **Pragmatics:** Reasoning about beliefs

- **Dynamic View:** **Semantics:** Context Change Potentials

  1980's = instructions to change belief states

- **Motivations for the dynamic view**

  a. Presupposition projection (= computation)

  b. 'Donkey' Anaphora

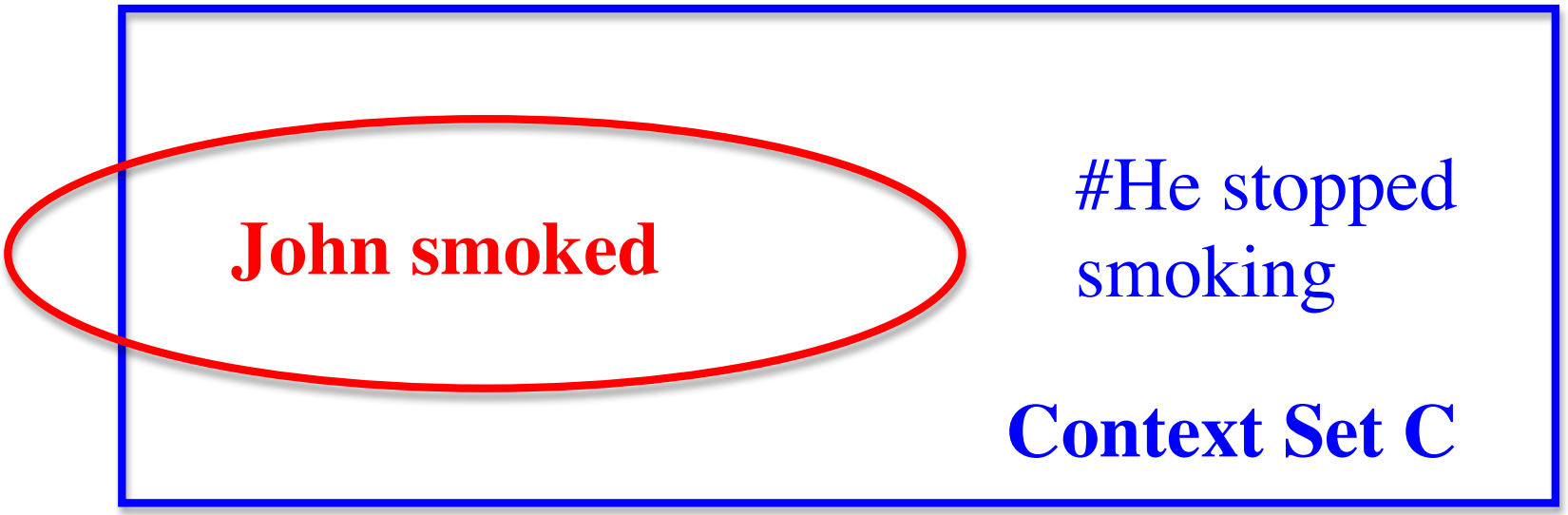
- a. **Result:** a **non-modular semantics-cum-pragmatics.**

  b. **Goal:** try to regain a semantics/post-semantics distinction.

1980's: the Dynamic Turn

- **Example:** C[F **and** G] = C[F][G]
  C = belief state = set of contexts ('context set')
  C[F] = update of C with F = **set of F-contexts within C**
  C[F][G] = successive update of C with F, and *then* with G.

- a. **Presuppositions:** John smoked and he **stopped smoking**
  b. **Pronouns:** $[\text{A man}]_i$ entered and **he**$_i$ sat down.



1980's: the Dynamic Turn

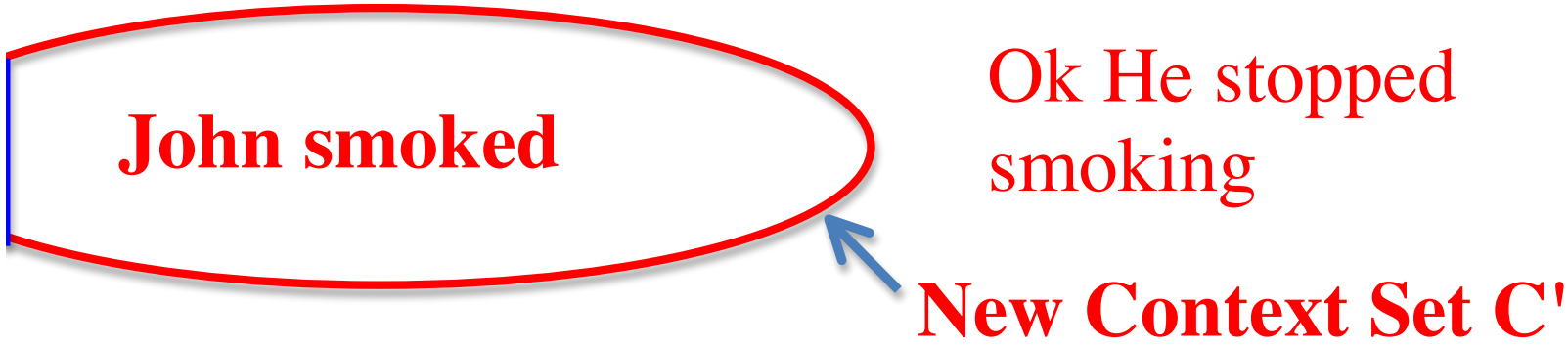
- **Example:** C[F **and** G] = C[F][G]

  1. C[F] is defined iff C satisfies the presupposition of F. If so, C[F] ={w ∈ C: w satisfies F}=set of F-contexts within C

  2. C[F and G] = C[F][G]

- a. **Presuppositions:** John smoked and he **stopped smoking**

  b. **Pronouns:** [A man]$_i$ entered and **he**$_i$ sat down.



[Motivation I: Presupposition]

- **Presupposition** e.g. John stopped smoking

  a. **Intuitive motivation**

  (i) a presupposition must be satisfied in the context set...

  (ii) ... which may result from the earlier discourse.

  b. **Technical implementation**

  (i) context sets as belief states are sets of possible worlds...

  (ii) ... and connectives manipulate sets of possible worlds.

- C[F **and** G] = C[F][G] e.g. John smoked and he stopped

  C[John_smoked **and** John_stopped_smoking]

  = (C[John_smoked])[John_stopped_smoking]

  = {w ∈ C: John smoked in w}[John_stopped_smoking]

  ☞ The presupposition isn't satisfied in the original context set C, but it is in the intermediate context set C[F]

Motivation I: Presupposition

- **Sue is abroad, and her brother is wasting his time, too.**

- a. her brother blah too presupposes:
  someone other than her brother [here: Sue] blah.

  b. The presupposition is satisfied if for every w ∈ C:
  Sue is abroad in w => she is wasting her time in w

Motivation I: Presupposition

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  b. The presupposition is satisfied if for every w ∈ C:
  Sue is abroad in w => she is wasting her time in w

[Motivation II: Donkey Anaphora]

- **Pronouns** e.g. He sat down

  a. **Intuitive motivation**

  (i) a pronoun must refer to a salient entity in the context set...

  (ii) ... which may result from earlier discourse.

  b. **Technical implementation**

  (i) context sets as belief states are sets of <world, assignment function> pairs...

  (ii) ... and operators manipulate these sets.

- C[F **and** G] = C[F][G] e.g. A man entered and he sat down

  C[[a_mani entered] **and** [hei sat down]]

  = (C[a_mani entered])[hei sat down]

  = {c[i → d]: c ∈ C and c(i) entered in world(c)}[hei sat_dn]

  = {c[i → d]: c ∈ C and c(i) entered and sat dn in world(c)}

  ☞ i isn't in C but it is in the intermediate context set C[F]

Motivation II: Donkey Anaphora

- **Example:** C[F **and** G] = C[F][G]
  C = belief state = set of contexts ('context set')
  C[F] = update of C with F = **set of F-contexts within C**
  C[F][G] = successive update of C with F, and *then* with G.

- a. **Presuppositions:** John smoked and he **stopped smoking**
  b. **Pronouns:** $[\text{A man}]_i$ entered and **he**$_i$ sat down.

= {c[i → d]: c ∈ C and c(i) entered
and sat down in world(c)}

(My) Impression in 2000

- **Presupposition Projection provided a strong argument for the dynamic approach:** no non-dynamic game in town.

- **Donkey Anaphora provided a very weak one:**
  the data could be analyzed in an E-type framework, **without** non-standard binding: **no real coindexing** because
  he goes proxy for *the man*, or *the man who entered*

- **Suggestion: it's the other way around.**
  a. A better, more modular, more predictive and non-dynamic theory of presupposition can be offered.
  b. By contrast, one aspect of the dynamic analysis of anaphora is vindicated by new data, from sign language.

Results of Dynamic Semantics

- a. ***Result 1:*** **(p and ‘q’) presupposes: p ⇒ q**
  Sue is abroad, and her brother is wasting his time, too.

  b. ***Result 2:*** **(if p, ‘q’) presupposes: p ⇒ q**
  If Sue goes abroad, her brother will waste his time, too.

  c. ***Result 3:*** **(p or ‘q’) presupposes: (not p) ⇒q**
  Sue won't go abroad, or her brother will waste his time, too.

- a. The original approach (Stalnaker 1974) was pragmatic: **belief update** did the work for *and*. But it didn't generalize...

  b. ... and in dynamic semantics the '**context change potentials**' of various operators had to be stipulated.

The Explanatory Problem

- **A problem of overgeneration**

  C[F and G] = (C[F])[G]

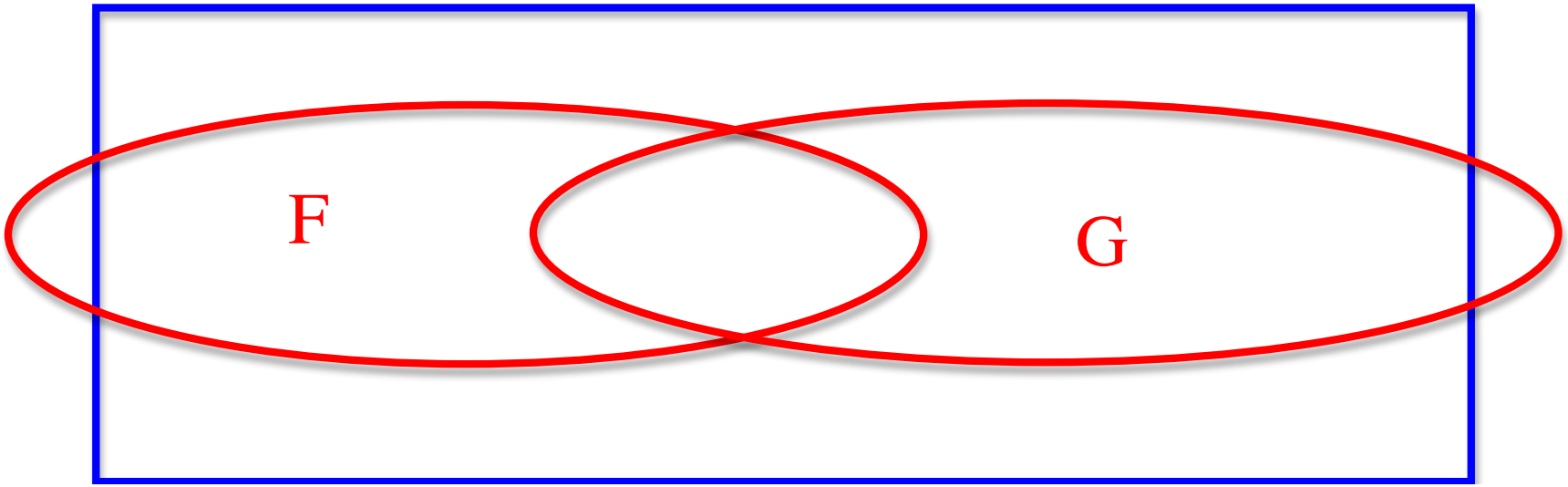
  C[F and* G] = (C[G])[F]

  C[F and** G] = C[F] ∩ C[G]

- **We haven't *derived* presupposition projection behavior**

  When F and G are presupposition-free,

  C[F and G] = C[F and* G] = C[F and** G]



A Derived Property: Transparency

- ***Result 1:*** **(p and qq') presupposes: p ⇒ q**
  ... and when **p ⇒ q**, then: **(p and qq') ⇔ (p and q')**

- Sue is abroad, and her brother is wasting his time, too
  presupposes Sue is abroad ⇒ she is wasting her time

- **Derived Property:** if Sue is abroad ⇒ she's wasting her time
  then the presupposition *Sue is wasting her time* is 'erasable':

- **Transparency:** C guarantees that for all **blah**
  Sue is abroad and [she is wasting her time and **blah**]
  ⇔ Sue is abroad and **blah**

- **Transparency ⇔ if Sue is abroad, she's wasting her time**

Transparency-based Theories

- a. ***Result 1:*** **(p and qq') requires: C |= if p, q**
  Sue is abroad, and her brother is wasting his time, too.

  ... and if C |= if p, q, C |= (p and qq') ⇔ (p and q')

  b. ***Result 2:*** **(if p, qq') requires: C |= if p, q**
  If Sue goes abroad, her brother will waste his time, too.

  ... and if C |= if p, q, C |= (if p, qq') ⇔ (if p, q')

  b. ***Result 3:*** **(p or qq') requires: C |= if not p, q**
  Sue won't go abroad, or her brother will waste his time, too.

  ... and if C |= if not p, q, C |= (p or qq') ⇔ (p or q)
  [because (p or qq') ⇔ (p or ((not p) and qq')]

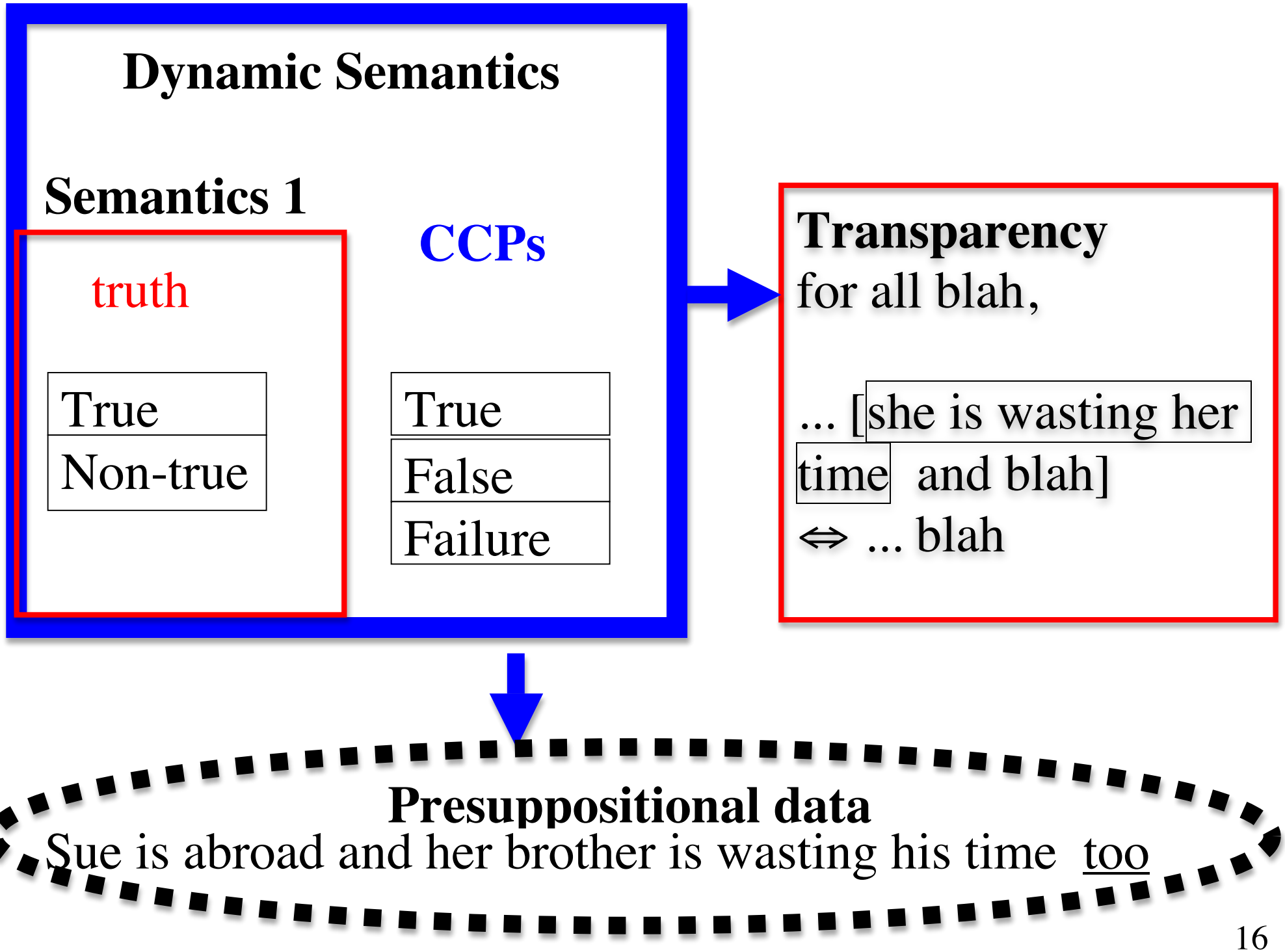
Transparency-based Theories

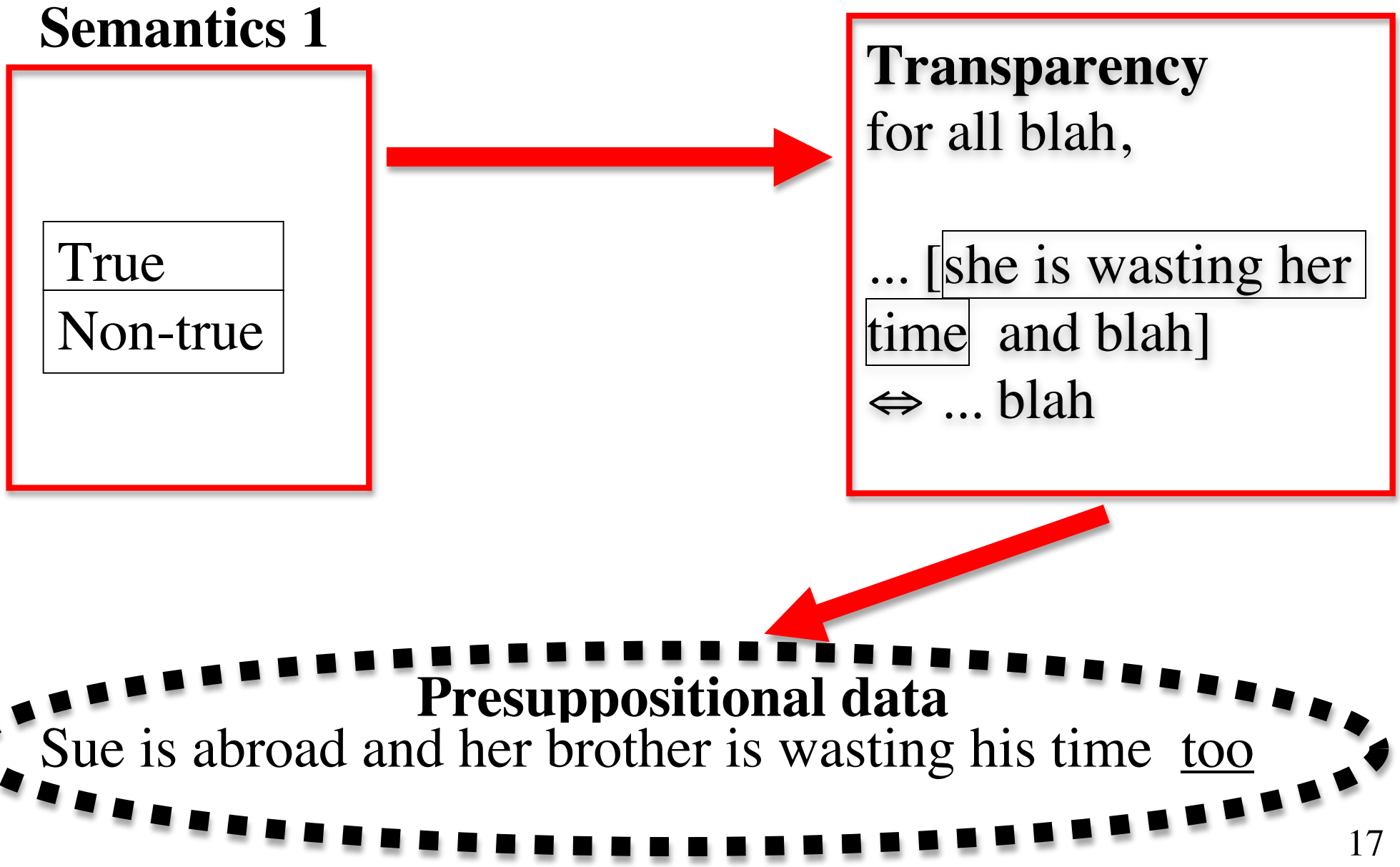
- **Derived Property: Transparency**
  A sentence with the presupposition 'erased' has the same meaning relative to C as the original sentence.

- **Transparency-Based Analyses** (Schlenker 2008, 2009, 2010)
  a. Turn the Derived Property into the **centerpiece of a theory of presupposition projection.**
  b. The derived property can be stated without dynamic sem.
  => **non-dynamic**, **modular and predictive algorithm**

- **Incrementalism**

  We need a difference between **(p and qq')** vs. **(qq' and p)**
  => require that presuppositions be transparent **no matter how the sentence ends**.


Dynamic Semantics
Semantics 1
truth
True
Non-true
CCPs
True
False
Failure
Transparency
for all blah,
... [she is wasting her time and blah]
⇔ ... blah
Presuppositional data
Sue is abroad and her brother is wasting his time too


Semantics 1
True
Non-true
Transparency
for all blah,
... [she is wasting her time and blah]
⇔ ... blah
Presuppositional data
Sue is abroad and her brother is wasting his time too

[Informal Example]

- **Generalization:**

  (p and qq') is presuppositionally acceptable

  iff C |= if p, q

- **Transparency:** C should guarantee that *q* is 'erasable', i.e.

  for all **blah** , C |= (p and **blah**) ⇔ (p and (q and **blah**))

- **C |= if p, q ⇒ Transparency**

  Clearly, when *q* follows from *p*, *q* is redundant here.

- **Transparency ⇒ C |= if p, q**

  Take **blah** to be a tautology T; we have:

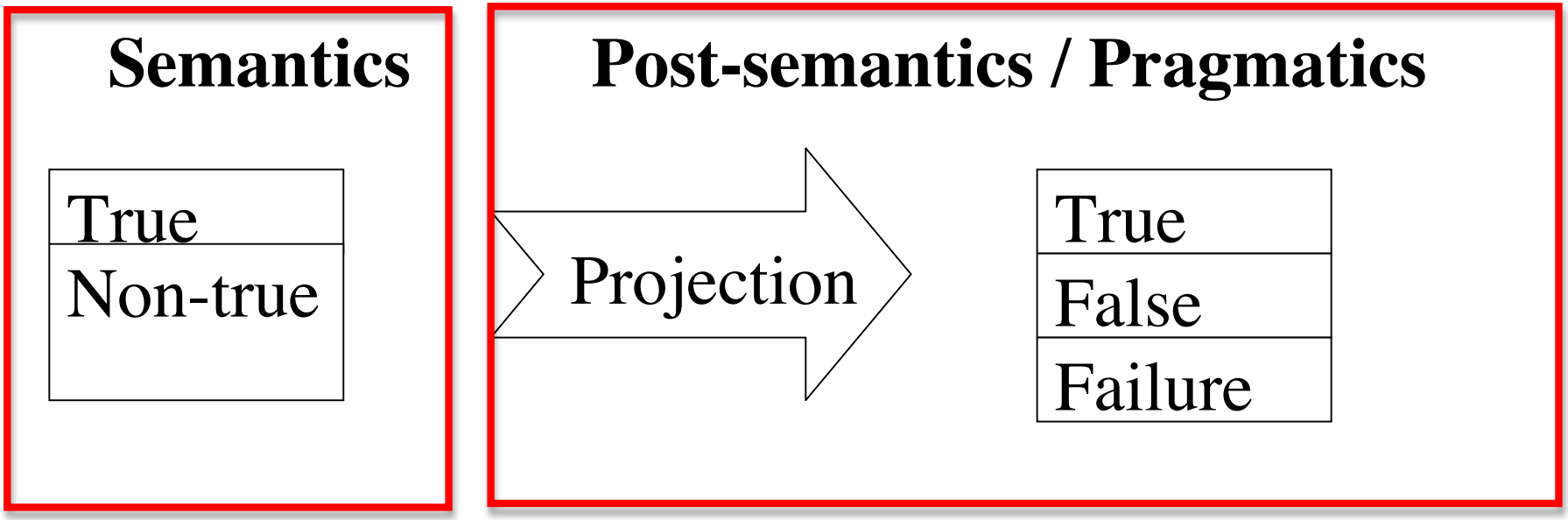
  C |= p ⇔ (p and q)

  hence C |= p ⇒ q

Predictive Theories

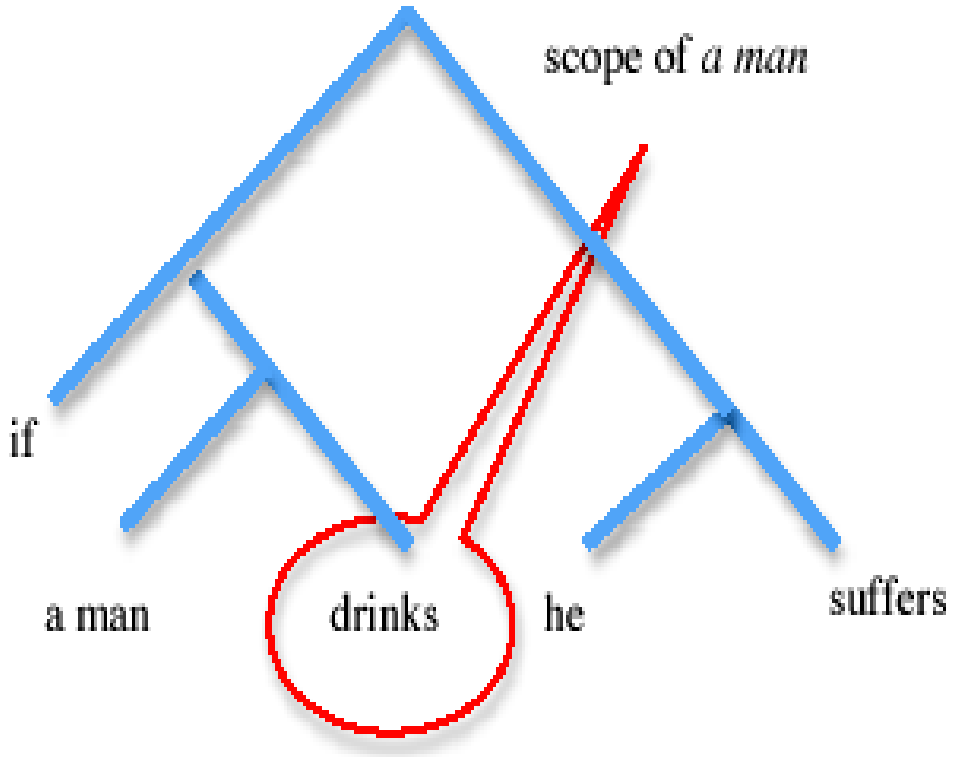
- **Explanatory Depth**
  Find an algorithm which **predicts** how presuppositions are projected by various operators once their **syntax** and their **bivalent truth-conditional behavior** has been specified.

- **Modularity** (see Fox, Chemla; George, Rothschild; Beaver, v Sandt)



Donkey Anaphora

- **Problem:** A pronoun can depend on an indefinite **without** being in its c-command domain.



Donkey Anaphora

- **Theory I. Dynamic semantics + pronouns as variables**
  Intuition: Indefinites introduce 'discourse referents'
  => a new kind of logic, 'dynamic logic', is needed: variables can depend on non-c-commanding quantifiers.

- **Theory II. Standard semantics + pronouns as descriptions**
  Intuition: Pronouns are concealed definite descriptions –
  e.g. *he* ≈ *the man (who drinks)*
  => no real coindexing, hence no need for a new logic
  => **definite descriptions are presupposition triggers, hence a reduction to presupposition theory.**

Initial 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.
  it ≈ the bathroom (after B. Partee)

  b. I doubt that this house has no bathroom – but it must be well hidden.
  it ≈ the bathroom

- **Indices are not pronounced, hence arguments have been indirect... and complex.**

Sign Language Pronouns as Indices

(Lillo-Martin and Klima 1990)

- **English**

  I know Bush$_i$ and I know Obama$_k$. He$_{i/k}$ is smarter than him$_{i/k}$

- **ASL** (Inf 1, 4, 179)

  IX-1 KNOW PAST PRESIDENT **IX-a**
  IX-1 KNOW NOW PRESIDENT **IX-b**.

  IX-b SMART BUT **IX-a** NOT SMART.

  'I know [the previous President]$_a$ and I know [the current President]$_b$. He$_b$ is smart but he$_a$ isn't.'

[Shared Formal Properties]

	English	Sign Languages
Ambiguity w/o ellipsis	Sarkozy$_1$ told Obama$_2$ that he$_{1/2}$ would win.	ASL: overt indices
		LSF: overt indices
Ambiguity in ellipsis	Peter$_1$ loves his$_1$ wife. John$_2$ does too.	ASL: Yes
		LSF: Yes
Condition B	*John$_1$ admires him$_1$ John$_1$ admires himself$_1$	ASL: Yes (but…)
		LSF: Yes (but…)
Weak/Strong Crossover	??Who$_1$ do his$_1$ students like?	ASL: Yes (but...)
		LSF: ?

Argument from Sign Language

- Sign language pronouns and spoken language pronouns have enough properties in common that they can be taken as **two instantiations of the same abstract system**.

- But sign language pronouns **make explicit (by way of pointing) what is their antecedent is.**

- In crucial examples, sign language shows that
  - the antecedent **introduces a locus** (e.g. **IX-a**)
  - the pronoun **retrieves this locus** (usually **IX-a**)
  - this formal connection is **semantically interpreted**

  without c-command between the pronoun and its antecedent.

- **This yields evidence for coindexing without c-command.**

Sign Language Data

- **ASL** (Schlenker, to appear; Inf 1 i P1040966)
  WHEN $_{a}$**ONE** AND $_{b}$**ONE** LIVE TOGETHER,
  'When someone and someone live together,

  a. **IX-a** LOVE **IX-b**
  the former loves the latter.'

  b. **IX-b** LOVE **IX-a**
  the latter loves the former.'

  a'. #**IX-a** LOVE **IX-a**

  b'. #**IX-b** LOVE **IX-b**

- **Dynamic Semantics:** everything is as expected, i.e.
  indexing without c-command, semantically interpreted

- **Pronouns as descriptions: which description?**
  When someone and someone live together,
  the person loves the person?
  the person that lives with a person loves, etc.?

[Sign Language Data]

- **LSF**

  IX-b GERMAN$_{b}$ GERMAN$_{a}$ a,b-MEET.
  IX-b KNOW **IX-a** LONG-TIME
  'A German met a German. He had long known him.' (Inf H, 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 ?

Surprising New Data: Negative Antecedents

- **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. (Inf 1, i, P1040980; i, P1040981)
  'I don't think no one will go to Mars. He [= the person who goes to Mars] will be famous.'

[More Examples: Negative Antecedents]

- **ASL**

a. IX-1 THINK $_a$[SOMEONE DEMOCRAT PERSON] WILL MATCH SUPPORT HEALTH CARE BILL WITH $_b$[SOMEONE REPUBLICAN PERSON]. IX-1 THINK IX-a WILL a-GIVE-b A-LOT MONEY.
'I think that a Democrat will co-sponsor the healthcare bill with a Republican. I think he [= the Democrat] will give him [= the Republican] a lot of money.' (Inf 1, 2, 228a; i P1040976)

b. # IX-1 THINK NO $_a$[DEMOCRAT PERSON] WILL MATCH SUPPORT HEALTH CARE BILL WITH $_b$[REPUBLICAN CL]. IX-1 THINK IX-a WILL a-GIVE-b A-LOT MONEY. (Inf 1, 2, 228b; i, P1040976)

c. IX-1 DOUBT $_a$[NO DEMOCRAT PERSON $_a$IX-open-hand] WILL MATCH SUPPORT HEALTH CARE BILL WITH $_b$[REPUBLICAN CL]. IX-1 THINK IX-a WILL a-GIVE-b A-LOT MONEY. (Inf 1, 2, 229 (see also 228c); i, P1040976)
'I don't think no Democrat will cosponsor the healthcare bill with a Republican. I think he [= the Democrat] will give him [= the Republican] a lot of money.'

Follow-up: Who will give money? Answer: 'the person who cosponsors' (2, 229) / 'the Democrat who cosponsors the bill' (i, P1040976)

[More Examples: Negative Antecedents]

- **LSF**

  Note: UMP is the (right-wing) governing party in France; PS is the opposition socialist party

  $_{c}$[PERSON UMP] IX-c ACCEPT WRITE LAW a-WITH $_{a}$[PERSON PS] – NONE; IX-b TRUE NOT. BUT IX-c MONEY c-GIVE-a.
  'It is not true that no UMP member will accept to write a bill with a member of PS. But he [= the member of UMP] will give him [= the member of PS] money.' (Inf F, 3, 107)

Conclusion

- **Explanatory Problem:** Dynamic semantics is *very* expressive. But for this reason it lacks explanatory depth.
- **Result 1: Presupposition without Dynamic Semantics**
  It is possible to derive similar or better results from a theory which (i) is modular, and (ii) is more predictive.
- **Result 2: Donkey Anaphora with Dynamic Semantics**
  • E-type analyses make it possible reduce (in part) donkey anaphora to a (non-dynamic) theory of presupposition.
  • But indexing without c-command is clearly available in SL.
- **Finally:** **Result 2** provides an argument for **indexing without c-command**, not for **all** of dynamic semantics. **Can we interpret such indexings without dynamic semantics?**

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