

Expanding our Formalism, Part 2¹

1. The Semantics of ‘Common Nouns’ and Adjectives

Our ‘lexicon’ currently consists of entries for the following:

- *Proper names* [[Obama]] = Obama
- *Intransitive Verbs* [[smokes]] = [$\lambda x : x \in D_e . x \text{ smokes}$]
- *Transitive Verbs* [[likes]] = [$\lambda x : x \in D_e . [\lambda y : y \in D_e y \text{ likes } x]$]
- *Sentence Connective* (‘it is not the case that’), *Conjunction* (‘and’)...

(1) Question: Adjectives and ‘Common Nouns’?

But what about adjectives like *American* and so-called ‘common nouns’ like *politician*?
What sort of entries should they receive?

(2) Our Methodology for Answering This Question

- Find some (restricted) class of sentences where these lexical items appear.
- Develop lexical entries for those lexical items that will capture the truth-conditions of those sentences...*(and work out from there to other constructions...)*

(3) Predicative Uses of Adjectives and Common Nouns

Following the methodology in (2), the restricted class of sentences we’ll work with are those where adjectives and common nouns seem to function as a ‘main predicate’.

- Obama is American.
- Obama is a politician.

(4) The Questions We Have to Answer

- What is the extension of *American*?
- What is the extension of *politician*?
- What is the extension of *is*?
- What is the extension of *a*?

¹ These notes are based on the material in Heim & Kratzer (1998: Chapter 4).

1.1 Semantics for the Copula *Is*

Let's begin with the sentence in (3a), *Obama is American*. In order for our system to capture this sentence, we need a lexical entry for *is* and a lexical entry for *American*.

(5) The Semantics of the Copula: The Leading Idea

For the time being, let's assume that the copula *is* in English essentially has no real meaning, that it is *semantically vacuous*.

(Copulas are there for syntactic reasons [i.e., to morphologically express tense/aspect], and don't contribute anything to the semantics.)

(6) Some Motivation for 'The Leading Idea'

a. It's Tradition!

Grammarians have long considered 'copulae' to be semantically empty.

In Elementary School, we learn to call *is* a 'helping verb'. (It doesn't really mean anything, it just 'helps' adjectives and nouns to be predicates.)

The technical term 'copula' itself simply means something like 'joiner'.

b. Typological

There are many languages that lack copulae, and get along fine without them.

Lillooet (Salish; British Columbia)

emh-ál'qwem' [ti=peIalhtsítw=a]
good.looking DET=stranger=DET

The stranger is good looking.

Dholuo (Nilo-Saharan; Kenya)

Ochieng' **ofuo**.

Ochieng' **stupid**

Oching is stupid.

So how do we represent in our system the idea that *is* is 'semantically empty'?

(7) Implementation of 'The Leading Idea': Option 1

How about we just don't give *is* a lexical entry?

PROBLEM: Our system won't be able to compute the meaning of sentences that contain *is*.

(8) **Implementation of ‘The Leading Idea’: Option 2**

How about we give *is* a lexical entry, but one that effectively adds *nothing* to the meaning of the larger phrase?

...that is, we treat the meaning of the copula as an identity function!

a. $[[\text{is}]] = [\lambda f : f \in D_{\langle e, t \rangle} . f]$

The function from $\langle e, t \rangle$ functions to $\langle e, t \rangle$ functions, which takes an $\langle e, t \rangle$ function f and simply returns f .

For better or worse, we’ll opt for this approach to the ‘meaninglessness’ of the copula....

...Now, how do we treat the meaning of the adjective *American* in (3a)?

1.2 The Semantics of Adjectives

At this point, we can move to the goal below.

(9) **Goal: Derive the Following Truth-Conditional Statement**

“Obama is American” is T *iff* Obama is American.

(10) **Some Reasoning**

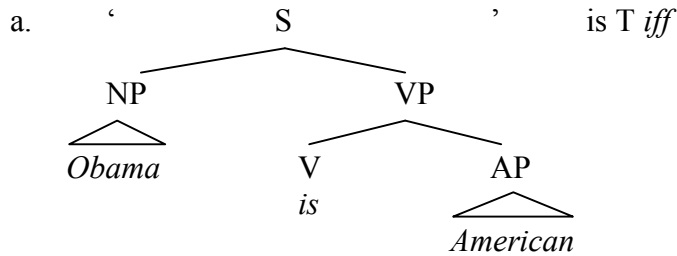
- Given our lexical entry in (8a), the extension of “is American” will simply be equal to the extension of “American”.
- Therefore – given familiar reasoning – “American” must be some $\langle e, t \rangle$ function that takes an entity (Obama) as argument and yields T iff that entity is American.

(11) **The Lexical Entry We Have Deduced**

$$[[\text{American}]] = [\lambda x : x \in D_e . x \text{ is American}]$$

Let’s now check that our system of lexical entries indeed derives the statement in (9)!

(12) **A Quick, Sample Derivation**



- b. $[[S]] = T$ iff (by FA, NNx2, TN)
- c. $[[VP]](Obama) = T$ iff (by FA, NNx3)
- d. $[[is]]([[American]])(Obama) = T$ iff (by TNx2)
- e. $[\lambda f : x \in D_{\langle e,t \rangle} . f]([\lambda x : x \in D_e . x \text{ is American }])(Obama) = T$ iff (by LC)
- f. $[\lambda x : x \in D_e . x \text{ is American }](Obama) = T$ iff
- g. Obama is American.

1.3 The Semantics of Common Nouns

So we now have a theory of how sentences like (3a) can be interpreted by our system....

Now let's turn to sentences like (3b), repeated below.

(13) Obama is a politician.

(14) **What We Need To Interpret This Sentence**

- a. Semantics for the copula. (done!)
- b. Semantics for the common noun *politician*.
- c. Semantics for the 'article' *a*.

(15) **The Semantics of the Article *a*: The Leading Idea**

As with the copula, let's (for now) assume that the indefinite article *a* is *semantically vacuous*.

...The article is there for syntactic reasons, but doesn't really (*in this sentence at least*) contribute anything to the sentence's T-conditions)...

(16) **Some Motivation for ‘The Leading Idea’: Typological**

There seem to be languages where nominal predication doesn’t require any article at all. (Even though NPs in argument position require an ‘article’)

a. Lillooet (Salish; British Columbia)
nk’yap [ti=t’ák=a]
coyote DET=go.along=DET
The one going along is a coyote.

b. Dholuo (Nilo-Saharan; Kenya)
Ochieng’ en **ajuoga**.
Ochieng COP **doctor**
Ochieng is a doctor.

(17) **Implementation of ‘The Leading Idea’**

As we did for the copula, we’ll assume that the article “a” in sentences like (13) simply has the identity function as its extension.

$[[a]] = [\lambda f : x \in D_{\langle e,t \rangle} . f]$

...OK, so now how do we treat the extension of the common noun ‘president’?

(18) **Goal: Derive the Following Truth-Conditional Statement**

“Obama is a politician” is T *iff* Obama is a politician.

(19) **Some Reasoning**

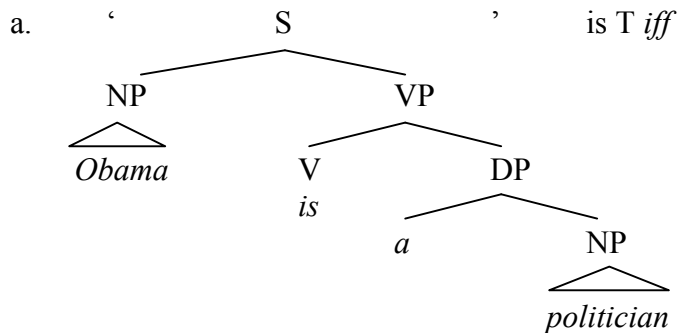
- Given our lexical entry for the copula in (8a), the extension of “is a politician” will simply be equal to the extension of “a politician”.
- Given our lexical entry for the article *a* in (17), the extension of “a politician” will simply be equal to the extension of “politician”.
- Therefore – given familiar reasoning – “politician” must be some $\langle e,t \rangle$ function that takes an entity (Obama) as argument and yields T *iff* that entity is a politician.

(20) **The Lexical Entry We Have Deduced**

$[[politician]] = [\lambda x : x \in D_e . x \text{ is a politician}]$

Let’s now check that our system of lexical entries indeed derives the statement in (18)!

(21) A Quick, Sample Derivation



- b. $[[S]] = T \text{ iff}$ (by FA, NNx2, TN)
- c. $[[VP]](\text{Obama}) = T \text{ iff}$ (by FA, NN)
- d. $[[is]] ([[a \text{ politician}]])(\text{Obama}) = T \text{ iff}$ (by FA, NNx3)
- e. $[[is]] ([[a]] ([[politician]]))(\text{Obama}) = T \text{ iff}$ (by TNx2)
- f. $[[is]] ([\lambda f : x \in D_{\langle e, t \rangle} . f]) ([\lambda x : x \in D_e . x \text{ is a politician }]) (\text{Obama}) = T \text{ iff}$
(by LC)
- g. $[[is]] ([\lambda x : x \in D_e . x \text{ is a politician }]) (\text{Obama}) = T \text{ iff}$ (by TN)
- e. $[\lambda f : x \in D_{\langle e, t \rangle} . f]([\lambda x : x \in D_e . x \text{ is a politician }])(\text{Obama}) = T \text{ iff}$ (by LC)
- h. $[\lambda x : x \in D_e . x \text{ is a politician }](\text{Obama}) = T \text{ iff}$
- i. Obama is a politician.

2. The Semantics of Adjectival Modification

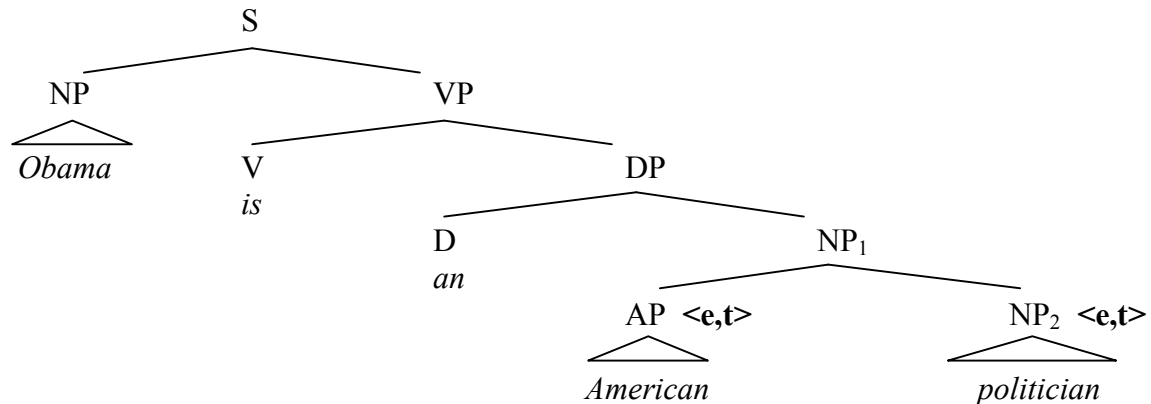
Currently, our system can interpret adjectives when they are main predicates (3a)...
But what about structures where adjectives modify nouns (22)?

(22) Adjectival Modification in English

Obama is **an American politician.**

If we assume that these sentences have the structure in (23) below, it's rather clear that our system at present cannot interpret them.

(23) **The Structure of Adjectival Modification**



(24) **The Problem**

We have no rule to ‘combine’ the $\langle e,t \rangle$ function contributed by *American* and the $\langle e,t \rangle$ function contributed by *politician* to get the meaning of the NP *American politician*.

(25) **The Solution, Part 1**

- Let’s introduce a new rule that lets us to combine $\langle e,t \rangle$ functions in the way we need.
- Rather than reason out *a priori* what this rule should be, let’s simply adopt the following rule and see what it does...

(26) **The Rule of ‘Predicate Modification’ (PM) [Heim & Kratzer (1998: 65)]**

If X is a branching node that has two daughters – Y and Z – and if both $[[Y]]$ and $[[Z]]$ are in $D_{\langle e,t \rangle}$, then:

$$[[X]] = [\lambda x : x \in D_e . [[Y]](x) = T \text{ and } [[Z]](x) = T]$$

The $\langle e,t \rangle$ function which takes an entity x , and yields T iff $[[Y]]$ applied to x is T and $[[Z]]$ applied to x is T .

Let’s now see via a quick, sample derivation what T-conditions the rule in (26) predicts for sentence (23)...

(27) **A Quick, Sample Derivation**

- a. (23) is T *iff* (by notation)
- b. $[[S]] = T$ *iff* (by FAx3, NNx4, TNx3, LCx2)
- c. $[[NP_1]](\text{Obama}) = T$ *iff* **(by PM)**
- d. $[\lambda x : x \in D_e . [[AP]](x) = T \text{ and } [[NP_2]](x) = T](\text{Obama}) = T$ *iff* (by NN, TN)
- e. $[\lambda x : [\lambda y : y \text{ is American }](x) = T \text{ and } [\lambda z : z \text{ is a politician }](x) = T](\text{Obama}) = T$ *iff* (by notation)
- f. $[\lambda y : y \text{ is American }](\text{Obama}) = T$ and $[\lambda z : z \text{ is a politician }](\text{Obama}) = T$ *iff* (by notation)
- g. Obama is American and Obama is a politician.

(28) **Derived T-Conditional Statement**

“Obama is an American politician” is T *iff* Obama is American and Obama is a politician.

(29) **Question**

Are the predicted T-conditions in (28) accurate?

(30) **Answer 1: Yes...Sort Of**

There does seem to be an interpretation of (22) where it has the T-conditions in (28), where all we mean by “American politician” is “politician who is American (by birth)”.

In certain structurally parallel examples, this kind of interpretation seems to be obligatory, and so T-conditional statements of the kind in (28) seem to be entirely right.

(31) **Other Sentences for Which the Predictions Seem Correct.**

- a. “Joe is a **married politician**” is T *iff* Joe is **married** and Joe is a **politician**.
- b. “Mittens is **an angry cat**” is T *iff* Mittens is **angry** and Mittens is a **cat**.
- c. “Seth is a **male semanticist**” is T *iff* Seth is **male** and Seth is a **semanticist**.

So, can we use the rule of PM to interpret all cases of adjectival modification?...

(32) **Answer 2: No...Sort Of**

- While there is one reading of (22) where the T-conditions in (28) hold, there is another reading where they do not.
- Under this latter reading, “American politician” means something like “politician in the American political system”.
- Under this latter reading, a person might be American (by birth), and a politician (e.g. in the UK), but *fail to be an ‘American politician’*.
(Consider the sentence “Arnold Schwarzenegger is an Austrian politician.”)

This kind of reading is clearer in certain parallel examples:

(33) **Other Sentences for Which the Predicted T-Conditions Seem to be Wrong**

- a. “Obama is a young politician” is T *iff* Obama is young and Obama is a politician.
- b. “Allen Iverson is a short basketball player” is T *iff* A.I is short and A.I. is a basketball player.
- c. “Seth is **a good liar**” is T *iff* Seth is **good** and Seth is **a liar**.

(34) **Conclusion**

There seem to be some adjectival modification structures where the rule of PM makes the wrong predictions.

So, how can we handle these cases?

(35) **Guiding Intuition**

To be a ‘good liar’ is not to be ‘good’ in some absolute sense and ‘a liar’ in some absolute sense, but to be *good at lying*.

Generalizations:

- a. a “good NP” is an entity that is “good as an NP”.
- b. a “young NP” is an entity that is “young for an NP.”
(thus, Obama can be a young politician without actually being *young*.)
- c. a “short NP” is an entity that “short for an NP”
(thus, A.I. can be a short bb player without being *short*.)

(36) **Proposal**

Let's treat some adjectives as not being inherently of type $\langle e,t \rangle$, but rather being inherently of type $\langle \langle e,t \rangle, \langle e,t \rangle \rangle$, as follows:

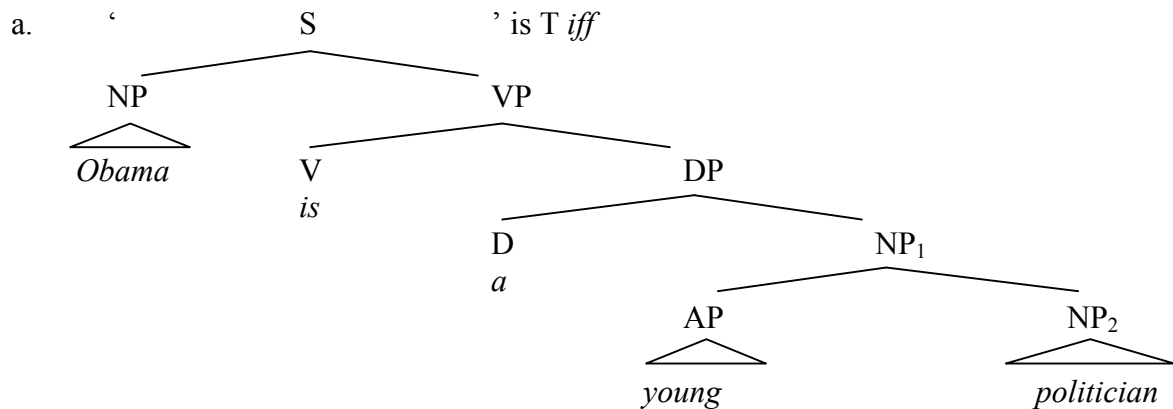
$[[\text{young}]]$ =
 $[\lambda f : x \in D_{\langle e,t \rangle} . [\lambda x : x \in D_e . x \text{ is below the average age for the entities in } \{ y : f(y) = T \}]]$

$[[\text{short}]]$ =
 $[\lambda f : x \in D_{\langle e,t \rangle} . [\lambda x : x \in D_e . x \text{ is below the average height for the entities in } \{ y : f(y) = T \}]]$

Note:

Extending this basic formal idea to cases like “good” will require machinery we’ve not yet introduced. However, the basic idea remains (essentially) the same.

(37) **A Quick, Sample Derivation**



b. $[[S]] = T \text{ iff}$ (by FA, NN, TN)

c. $[[NP_1]](\text{Obama}) = T \text{ iff}$ (by FA, NN)

d. $[[\text{young}]]([[politician]])(\text{Obama}) = T \text{ iff}$ (by TN)

e. $[\lambda f : x \in D_{\langle e,t \rangle} . [\lambda x : x \in D_e . x \text{ is below the average age for the entities in } \{ y : f(y) = T \}]]([\lambda z : z \in D_e . z \text{ is a politician }])(\text{Obama}) = T \text{ iff}$ (by LC)

f. $[\lambda x : x \text{ is below the average age for the entities in } \{ y : [\lambda z : z \text{ is a politician }](y) = T \}](\text{Obama}) = T \text{ iff}$ (by LC)

g. Obama is below the average age for the entities in $\{ y : y \text{ is a politician } \}$

(38) **Derived Truth-Conditions**

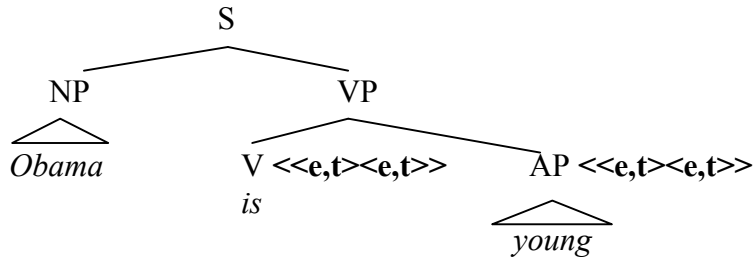
“Obama is a young politician” is T *iff* Obama is below the average age for a politician.

Unlike the T-conditions in (33a), the ones in (38) seem entirely correct!

(39) **Problem**

If “young” is of type $\langle\langle e,t\rangle\langle e,t\rangle\rangle$, then how can we interpret sentences like (40)?

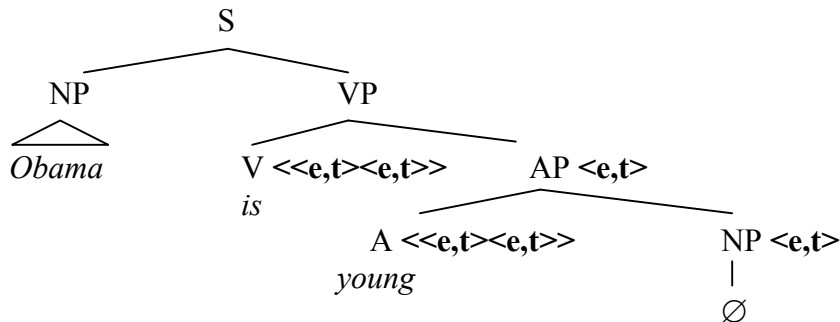
(40) **Adjective ‘Young’ Functioning as Main Predicate**



(41) **Solution (or, rather, Hack)**

- Let’s assume that there is a *phonologically empty NP* in sentences like (40).
- That is, let’s assume that (40) really has the structure in (42).

(42) **Adjective ‘Young’ Functioning as Main Predicate**



This gets the abstract ‘type structure’ right. But, how is this unpronounced NP interpreted?

Let’s suppose (as a hack) that it simply denotes $[\lambda x : x \text{ is a person}]$

(43) **Predicted Truth-Conditions**

“Obama is young” is T *iff* Obama is below average age for the set of people.

But this doesn’t seem to be enough... what about sentences like (44a)? They shouldn’t be assigned the T-conditions in (44b)!

(44) **Problem for the Simple Hack Above**

- Frodo the Hobbit is young.
- “Fordo the Hobbit is young” is T *iff* Frodo is below average age for **a person**.

(45) **Expanded Solution (Expanded Hack)**

- Let's assume that there is a *whole bunch* of phonologically empty NPs.
- In addition to one meaning 'person', there's also one that means 'hobbit', one that means 'cat', one that means 'UMass Semanticist', *etc.*

(46) **Alternate Expanded Hack**

- There is only one phonologically empty NP in English, which appears in all sentences where 'young' appears alone as a main predicate.
- However, the meaning of this NP isn't stated in the lexicon. Rather, the meaning is entirely open, and is *determined by context*.

We don't yet have a theory of how meanings are determined 'by context', but we will soon...

(47) **Question: Do We Need PM Anymore?**

If English has a phonologically empty NP whose meaning is set by context, then can't we just treat *all adjectives* as being of type <<et><et>>, even ones like "male"?
...This way, we could dispense with the rule of PM entirely!

(48) **Some Reasons for Keeping PM**

- a. For some adjectives, it seems a bit of a stretch to treat them as type <<et><et>>, and it's more natural to think of them as simple predicates.
 - In what sense is a 'pregnant woman' simply 'pregnant for a woman'?
 - In what sense is a 'male nurse' simply 'male for a nurse'?
- b. As we'll see, we will want the rule of PM to interpret NPs that are modified by *relative clauses*.
 - "Obama is a man who smokes" is T iff Obama is a man and Obama smokes.

(49) **The Picture That Emerges**

There are (at least) two types of adjectives in natural language.

- a. Intersective Adjectives [*male, married, angry*]
These adjectives are inherently predicative (of type <et>).
In modificational structures, they are interpreted via a special rule of PM.
- b. Non-Intersective (Subjective) Adjectives [*good, young, tall*]
These adjectives are inherently modificational (of type <<et><et>>).
In predicative structures, they are interpreted via an 'invisible' NP argument.

3. The Semantics of Definite DPs

Thus far, our semantics is able to interpret common nouns that occupy predicate position (50a).
...However, the most ‘common’ position for common nouns to occupy is internal to DPs that occupy *argument positions*, as in (50b).

(50) The Possible Positions of Common Nouns

- a. Predicate Position: Obama is a **politician**.
- b. Argument Position:
 - (i) [A **politician**] arrived from Washington.
 - (ii) Joe likes [the **politician**].
 - (iii) [Many **politicians**] are corrupt.

Much of our work this term will be aimed at understanding how to interpret complex DPs such as these (particularly quantificational DPs like *many politicians*).

But, we have to start somewhere, and so we’ll get things going by introducing a ‘rough-and-ready’ system for the interpretation of *definite* DPs like *the politician*.

(51) Opening Question: What is the Semantic Type?

There is actually a long and unresolved debate regarding what the semantic type of a definite DP is:

- a. Are definite DPs like proper names, and denote entities?
[[the president]] = Barack Obama
- b. Or, are definite DPs like quantificational expressions (*many politicians*), and denote (as we will later see) complex functions?

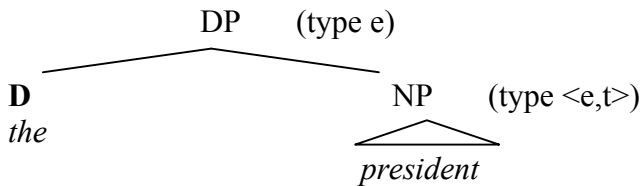
(52) The (Controversial) Answer We Will Assume

Definite DPs are of type e, and denote entities just like proper names.

- a. [[the president]] = Barack Obama
- b. [[the professor for this class]] = Seth Cable
- c. [[the capital of Massachusetts]] = Boston
- d. [[the drummer for Metallica]] = Lars Ulrich

(53) Working Towards the Semantics of the Definite Article

So, what is the meaning of the definite article? Let's start by asking what its type is.



- It seems that the extension of *the* takes a type $\langle e,t \rangle$ function as argument, and returns an entity as the extension of the entire DP.
- Thus, the definite article *the* is of type $\langle \langle e,t \rangle e \rangle$

OK... but what is this $\langle \langle e,t \rangle e \rangle$ function? How is it defined, exactly?

(54) Some Initial Observations

- *the* takes $[[\text{capital of Massachusetts}]]$ as argument, and returns Boston
- Following our doctrines regarding the interpretation of NPs, we know that:
 $[[\text{capital of Massachusetts}]]$ = $[\lambda x : x \text{ is a capital of Massachusetts}]$
- Key Observation

The function $[\lambda x : x \text{ is a capital of Massachusetts}]$ has a pretty salient property:
In all of D_e , it assigns T to exactly one thing: Boston

- Key Generalization

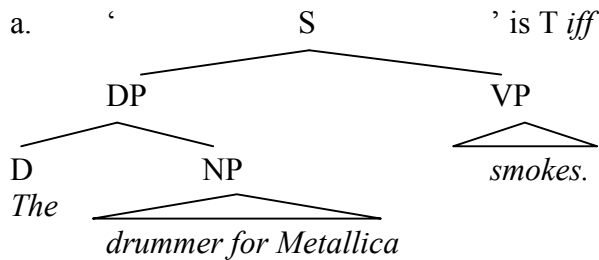
the takes an $\langle e,t \rangle$ predicate as argument, and yields **the one entity which the $\langle e,t \rangle$ predicate is true of.**

(55) A Formalization of the ‘Key Generalization’

$[[\text{the}]]$ =
 $[\lambda f : f \in D_{\langle e,t \rangle} \text{ and there is exactly one } x \text{ such that } f(x) = T . \text{ the unique } y \text{ such that } f(y) = T]$

The function whose domain is **those $\langle e,t \rangle$ functions f which assign true to exactly one entity**, and which for all such functions f ,
yields that unique entity y such that $f(y) = T$

(56) Sample Derivation



- b. $[[S]] = T \text{ iff}$ (by FA, NNx2, TN)
- c. $[\lambda x : x \text{ smokes }] ([[DP]]) = T \text{ iff}$ (by FA, NN)
- d. $[\lambda x : x \text{ smokes }] ([[the]] ([[NP]])) = T \text{ iff}$ (by TN, NN)
- e. $[\lambda x : x \text{ smokes }]$
 $([\lambda f : f \in \mathbf{D}_{\langle e,t \rangle}$ **and there is exactly one x such that f(x) = T . the unique y**
such that f(y) = T] ($[\lambda z : z \text{ is a drummer for Metallica }])) = T \text{ iff}$
 (by LC)
- f. $[\lambda x : x \text{ smokes }]$
 (the unique y such that $[\lambda z : z \text{ is a drummer for Metallica }] (y) = T) = T \text{ iff}$
- g. $[\lambda x : x \text{ smokes }]$
 (the unique y such that y is a drummer for Metallica) = T iff
- h. The unique y such that y is a drummer for Metallica smokes iff
- i. Lars Ulrich smokes.

(57) Key Consequence

Under the semantics in (55), what happens if we try to combine “the” with an NP whose extension is *not* true of exactly one entity?

- a. [the [**wheelchair access to the linguistics department**]]
- b. [the [**United States single-payer healthcare system**]]
- c. [the [**second season of Firefly**]]

Prediction: *These DPs cannot be interpreted by our system.*

- The extension of the NP simply isn’t in the domain of the extension of *the*.
- Consequently, FA cannot serve to interpret the entire DP.
- Thus, our system is unable to assign *any* interpretation to the DP at all.

(58) **Key Question**

Does this prediction in (57) match reality?

One (Controversial) Answer: *Yeah, sort of...*

- Since there is no wheelchair access to the linguistics department, I can't use this DP to refer to anything...
- ... and, indeed, if I were to start talking about 'the wheelchair access to the linguistics department', you wouldn't understand me at all...
- So, it does seem that such a DP *lacks an extension*...
- Since our system aims at computing the extensions of natural language structures, it rightly ends up not being able to assign any extension to this DP.

(59) **Technical Side-Note**

- Note that the domain of [[the]] is not all of $D_{\langle et \rangle}$, but only a *strict subset of it*.
- Consequently, it's not entirely accurate to say that [[the]] is of type $\langle et \rangle$

(60) **Technical Fix**

a. Partial Function:

A function f is a **partial** function from X into Y *iff* the domain of f is a *subset* of X , and its range is a subset of Y

b. $\langle X, Y \rangle =$ the type of *partial* functions from things of type X to things of type Y

c. $D_{\langle X, Y \rangle} =$ the set of all *partial* functions from D_X into D_Y

(60) **Further Key Consequence**

What happens if we put the 'uninterpretable' definites in (57) in some larger sentence?

- [[The [**wheelchair access to the linguistics department**]] is broken.]
- [[The [**United States single-payer healthcare system**]] needs more money]
- [[The [**second season of Firefly**]] was disappointing]

Prediction: *These sentences cannot be interpreted by our system.*

- Our 'interpretation function' [[]] maps phrases to their extensions.
- Since '[[]]' cannot deliver a value for the definite DPs, it cannot deliver a value for the sentence as a whole.
- *Consequently, these sentences can't get an extension... they can be neither T nor F*

(59) **Key Question**

Does this prediction in (60) match reality?

One Answer: *Yeah... sort of...*

- It's not really *false* to say that the second season of Firefly was disappointing.
- After all, it wasn't *not* disappointing... there just *was not* second season...

Another Answer: *No... not really...*

- If you say 'the second season of Firefly was disappointing', you are saying something *not true*... what you say *is misleading*...
- Since there was no second season, what you've said is 'wrong' in some larger sense, and so it's right to call it 'false'...

For our purposes, we'll side with the first answer...

...but see Heim & Kratzer (1998: Chapter 4) for some discussion on how the two different answers can be reconciled with one another...

(60) **Towards a Theory of Presupposition?**

Our semantics for the definite article – where it denotes a *partial* function – allows us, in a very crude and initial way – to begin to derive the **presuppositional content** of certain natural language expressions.

(61) **Presupposition (Our Crude Definition)**

p is a **presupposition** of sentence S = S is true *or false* only if p

(62) **Prediction of Our Semantics**

A sentence containing a DP of the form '[the NP]' can be true or false only if *there is exactly one entity x for which* $[[NP]](x) = T$.

(63) **Conclusion**

For a very limited set of structures, our semantic system is able to capture their *presuppositional* as well as their *asserted* content.

(...though we aren't 'deriving' them in the way we do for the asserted content...)

(63) **One Final Problem: Contextual Restriction**

- According to our semantics in (55), “the” can only take an NP as argument if the extension of the NP is true of *exactly one* entity.
- This means that “the” cannot take as argument NPs which are (intuitively) true of *many* NPs, like “cat”.
- But, we say things like “the cat” all the time, and are perfectly well understood!
(Even though that there are many cats out there in the world!)

(64) **The Generally Accepted Solution**

- In any given context, there is actually only a very small, strict subset of D_e that we are ‘talking about’, that we ‘have in mind’.
- Let’s call this limited set of entities C (for ‘contextually relevant entities’)
- When we use a definite DP like “the NP”, we are referring to that unique entity *from* C that satisfies $[[NP]]$.
- Thus, even though we know there are many cats *in the world* (D_e), we can use the DP “the cat” in context *exactly when* the set of contextually relevant entities (C) contains one and only one cat.

Example

- If I own exactly one cat, then I can in my house say “the cat is hungry”
- If I own two cats, then I *can’t* in my house say “the cat is hungry” (unless one of the other two cats is gone or something...)

A full formalization of ‘the generally accepted solution’ in (64) would be premature for us, since we don’t yet have a theory of what context is and how it can affect the meaning of linguistic elements...

...but we will soon...