

Quantificational DPs, Part 3: The Movement Account vs. the Type-Shifting Account ¹

1. Introduction

Thus far, we've considered two competing analyses of the structures like that in (1).

(1) Sentences Where a Quantificational DP is not in Subject Position

- a. Obama likes every politician.
- b. Joe likes some politicians.

(2) The Movement Account (Syntactic Account)

While sentences like those in (1) are *pronounced* with the quantificational DPs in object position, their semantics is derived from a more abstract structure where the quantificational DP has undergone (covert / silent / 'invisible') movement.

- a. *Pronounced Form:* / obama likes every politician /
- b. *Surface Structure:* [Obama [likes [every politician]]]
- b. *Logical Form:* [[every politician]] [Obama likes t_1]]

(3) The Type-Shifting Account (Semantic Account)

In sentences like (1), the quantificational DP is *not* of type $\langle et, t \rangle$, but of type $\langle eet, et \rangle$. There is a general rule which derives from basic expressions of type $\langle et, \langle et, t \rangle \rangle$, a derived set of expressions of type $\langle et \langle eet, et \rangle \rangle$

Type Shifting Rule for Quantifiers

If X is of type $\langle et, \langle et, t \rangle \rangle$, then there exists another, phonologically identical lexical item, X_2 , which is of type $\langle et, \langle eet, et \rangle \rangle$, and has the following meaning.

$$[[X_2]] = [\lambda g_{\langle et \rangle} [\lambda f_{\langle eet \rangle} [\lambda y_e : [[X]] (g) ([\lambda z_e : f(z)(y) = T])]]]$$

(4) Burning Question

Is there any way to empirically decide which of these analyses is correct?

(5) The Truth

- There is no obvious answer as to which is the better of the two analyses.
- Both analyses face problems, but the problems they face are different.
- Both analyses have been adjusted to deal with the sorts of problems they face, to the point that the debate is really over entire *frameworks* (or 'world-views', really...)

¹ These notes are based upon the material in Heim & Kratzer (1998: 193-238).

2. Some Advantages of the Movement Account over the Type-Shifting Account

We will first examine some advantages that the movement account offers over the type-shifting account (as currently formulated).

We will then take a look at some outstanding problems for the movement account (ones that the type-shifting account isn't necessarily immune to, either).

2.1 Verbs with More than One Argument

Consider the sentences in (6). The movement account is able to interpret them by hypothesizing that they have the LFs in (7).

(6) Quantificational DPs in Ditransitive Structures

- a. Obama gave *Dreams from My Father* to every senator.
- b. Obama gave every book to Joe.

(7) LFs Predicted by the Movement Account

- a. [[every senator] [1 [Obama gave *Dreams* of my father to t_1]]]
- b. [[every book] [1 [Obama gave t_1 to Joe]]]

(8) Crucial Problem (for Type-Shifting Account)

Our type shifting rule in (3) is not able to interpret *both* (6a) and (6b).

- It seems that that *every book* in (7a) is the first argument of *give*. Then *every book* must take an $\langle eet \rangle$ function as argument, and the rule in (3) doesn't allow that.

(9) Solution (for Type-Shifting Account)

We introduce the following, *new* type-shifting rule:

New Type-Shifting Rule for Quantifiers

If X is of type $\langle et, \langle et, t \rangle \rangle$, then there exists another, phonologically identical lexical item, X_2 , which is of type $\langle et, \langle eet, eet \rangle \rangle$, and has the following meaning.

$$[[X_2]] = [\lambda g_{\langle et \rangle} [\lambda f_{\langle eet \rangle} [\lambda x_e : [\lambda y_e : [[X]] (g) ([\lambda z_e : f(z)(x)(y) = T])]]]]]$$

(10) The Criticism (for Type-Shifting Account)

- The movement account predicts the facts in (6) 'for free'
- The type-shifting account has to introduce a new rule to capture (6b).

2.2 Pronominal Binding

The sentence in (11a) has the ‘bound reading’ in (11b).

(11) Binding by Quantificational Subjects

- a. Every man loves the woman who loves him.
- b. For all x , if x is a man, then x loves
the unique y such that y is a woman and y loves x .

Our movement account predicts the reading in (11b) by its ability to assign (11a) the LF in (12).

(12) Possible LF for (11a), Which Yields the Reading in (11b)

[[Every man] [$\mathbf{1}$ [t_1 loves [the woman who loves \mathbf{him}_1]]]]

Note that we wouldn’t actually be able to derive the bound reading from the surface form in (13):
... the issue is that there isn’t any lambda-operator binding the pronoun in (13)!

(13) Surface Structure of (11a), Which *Doesn’t* Yield the Bound Reading in (11b)

[[Every man] [loves the woman who loves him_1]]

(14) The Challenge (for the Type-Shifting Account)

- It looks like we need to assume some variety of ‘invisible movement’ in order to obtain the bound-reading of (11).
- So, why not suppose that such movement is also at play in examples like (1)?

(15) Some Possible Answers to the Challenge

- Introduce New Mechanisms for Pronominal Binding

The problem in (13)/(14) stems from the assumption that only *movement* can introduce the lambda operators that effectuate pronominal binding...

... so maybe we’re just wrong about that...

- Tolerate *Some* ‘Invisible’ Movement

The movement postulated in (12) doesn’t affect the basic word order of the sentence...

... so how do we know that (12) *isn’t* actually the *surface structure* of (11a)?

2.3 Antecedent Contained Deletion

(16) Initial Observation Regarding VP-Ellipsis

Ellipsis of a VP can only take place if there is some ‘matching VP’ in the context.

- a. Dave **went to school**, and I did too. (= I **went to school** too.)
- b. * I did too. (≠ I **went to school**)
- c. Dave **went to work**, and I did too. * (≠ I **went to school**)

If the generalization in (16) is correct, then what are we to make of the following sentences?

(17) Antecedent Contained Deletion (ACD)

- a. Dave read every book Phil did.
- b. Dave saw something Phil didn’t.

(18) The Nature of The Elided VPs

If we were to ‘spell out’ the elided VPs in (17), they would intuitively be the following.

- a. Dave read every book Phil [**read t_1**]
- b. Dave saw something Phil didn’t [**see t_1**]

(19) The Crucial Question

Where is the ‘matching VP’ in (17)/(18)? In the surface forms in (18), there is no other VP of the form ‘read/saw t_1 ’!

(20) The Solution (Movement Account)

The movement account provides a solution to the puzzle in (19). Note that the LFs derived from the surface forms in (18) would have to be as follows:

- a. [every book [Phil [**read t_1**]]] [2 [Dave [**read t_2**] ...]
- b. [something [Phil didn’t [**see t_1**]]] [2 [Dave [**saw t_2**] ...]

Key Observations

- The LFs in (20) will be assigned the correct T-conditions for (17)/(18)
- **In these LFs, there is a VP which ‘matches’ the elided VP in the relative clause! Namely, the VP created by (covert) movement of the quantificational DP!**

(21) **Movement-Based Analysis of ACD**

The 'antecedents' for VP ellipsis include the VPs created by *covert movement*.

(22) **The Challenge (For the Type-Shifting Account)**

- Because the movement account hypothesizes that the quantificational DPs in (17)/(18) undergo covert movement, that account automatically generates a possible antecedent for the ellipsis in (17).
- Under the type-shifting account, the quantificational DPs do *not* undergo movement from the VP at any stage of the derivation...
... so where is the matching VP that licenses the ellipsis?

(23) **A Possible Response to the Challenge**

- There *are* analyses of ACD which *don't* appeal to covert movement (Jacobson 1998)
(Key Idea: It's not really VP-ellipsis, but rather V-ellipsis)
- The movement-based account of ACD seems to predict that VPs created by *overt movement* should be able to serve as ellipsis antecedents too...
... but the data in (24) suggest that maybe they can't...

(24) **Ellipsis Licensed by Overt Movement?**

- ?? Every book Phil did, Dave read.
- ?? Something Phil didn't, Dave saw.

2.4 Inverse Scope

A classic observation about sentences like (25a) is that they are ambiguous, and admit of both the readings in (25b) and (25c).

(25) **Inverse Scope in English**

- A girl likes every boy.
- 'Surface Scope' Reading

There is some x such that x is a girl and **for all y**, if y is a boy, then x likes y
(True only if some particular girl (Mary) loves every boy)

- 'Inverse Scope' Reading

For all y, if y is a boy, then **there is some x** such that x is a girl and x likes y.
(True as long as every boy is loved by some girl (not necessarily the same))

(26) **Key Observation**

Our movement account predicts the existence of the ‘inverse scope’ reading in (25c)!

- Our movement account would predict that (25a) has (27a) as a possible LF.
- The structure in (27a) will be computed to have the T-conditions in (27b) (Exercise for the reader)

(27) **The Inverse Scope Reading**

a. Possible LF for (25a): [every boy] [1 [a girl likes t_1]]

b. T-Conditions Computed for (27a)

[[(27a)]] = T *iff* for all x, if x is a boy,
then there is a y such that y is a girl and y likes x

(28) **The Challenge (for the Type-Shifting Account)**

As the derivation below shows, our type shifting rule in (3) is not able to derive the inverse scope reading of (25a).

Illustrative Derivation:

- [[a girl likes every boy]] = T *iff* (by FA)
- [[a girl]] ([[likes every boy]]) = T *iff* (by (3), FA, LC, notation)
- [[a girl]] ([λy : for all x, if x is a boy, then y likes x]) = T *iff* (by FA, LC, notation)
- There is a y such that y is a girl, and for all x , if x is a boy, then y likes x.

(29) **Solution (for the Type-Shifting Account)**

New Type-Shifting Rule for Quantifiers

If X is of type $\langle et, \langle et, t \rangle \rangle$, then there exists another, phonologically identical lexical item, X_2 , which is of type $\langle et, \langle eet, \langle \langle et, t \rangle t \rangle \rangle \rangle$, and has the following meaning.

[[X_2]] =
[$\lambda g_{\langle et \rangle}$ [$\lambda f_{\langle eet \rangle}$ [$\lambda h_{\langle et, t \rangle}$: [[X]](g) ([λx_e : h ([λy_e : f(x)(y) = T]) = T]) = T]

(exercise to the reader: show that (29) does indeed get the inverse reading for “a girl likes every boy”)

(30) **The Criticism (for Type-Shifting Account)**

- The movement account predicts the inverse reading in (25c) ‘for free’
- The type-shifting account has to introduce a new rule to capture (25c).

(31) **A Counter-Criticism (for the Movement Account)**

- The type-shifting account predicts the ‘surface scope’ reading in (25b) ‘for free’
- The movement account can only predict (25b) if it allows for LFs that look like the following:

[Some girl] [1 [[every boy] [2 [t_1 likes t_2] ...]

- But *whatever movements derive these LFs covertly **don’t** seem to be possible movements that can occur **overtly** in English.*

“some girl every boy likes” doesn’t have a reading akin to (25b)

- So, the only way the movement account can capture the surface scope reading is via some weakening of the theory of (covert) movement...

2.5 Constraints on Quantifier Scope

The following is a central prediction of the movement based account:

(32) **The Movement-Scope Generalization**

If *general principles of movement* prevent a DP in a sentence S from moving to a position above X, then S will not admit of an interpretation where DP has scope above X.

Why Does the Generalization Hold?

- Suppose that DP is in a position in S where it can’t move to XP (for reasons relating to general principles of movement)

[S ... [XP ... X ... [YP ... DP ...] ...]



- (All things being equal), it follows that DP can’t move to XP *covertly* either. Consequently, S can’t be interpreted as if DP has scope over X.

(33) **Illustration: Relative Clause Islands**

General principles entail that movement cannot extract something from a relative clause.

- a. * No boy, Dave knows a man who likes.

Consequently, the movement theory predicts that (33c) is not a possible LF for (33b).

- b. Dave knows a man who likes no boy.
c. [No boy] [1 [Dave knows a man who likes t_1]]

Thus, the theory correctly predicts that (33b) *doesn't* have a reading with the T-conditions in (33d).

- d. There is no x such that x is a boy, and Dave knows a man who likes x.

(34) **Illustration: Adjunct Islands**

General principles entail that movement cannot extract something from a clausal adjunct.

- a. * No boy, If Dave sees, he will go home.

Consequently, the movement theory predicts that (34c) is not a possible LF for (34b).

- b. If Dave sees no boy, he will go home.
c. [No boy] [1 [If Dave sees t_1 , he will go home]]

The theory correctly predicts that (34b) *doesn't* have the reading in (34d).

- d. There is no x such that x is a boy, and if Dave sees x, he will go home.

(35) **Illustration: Wh-Islands**

General principles entail that movement cannot extract something from a wh-clause.

- a. * This book, Dave knows who to give.

Consequently, the movement theory predicts that (35c) is not a possible LF for (35b).

- b. Dave knows who to give every book.
c. [Every book] [1 [Dave knows who to give t_1]]

Thus, the theory correctly predicts that (35b) *doesn't* have the reading in (35d).

- d. For all x, if x is a book, then Dave knows who to give x.

(36) **The Criticism (for Type-Shifting Account)**

- The movement account predicts the generalization in (32) and thus the data in (33)-(35) ‘for free’.
- It’s not at all clear how the type-shifting account can capture the overall generalization in (32).

(37) **A Counter-Criticism (for the Movement Account)**

As we will see in a moment, the parallels between (i) the constraints on movement, and (ii) the constraints on the possible scopes of a DP, are not necessarily as close as the movement account predicts in (32)...

- a. There seem to be cases where movement of a DP can have scope over positions that it *shouldn't* be able to move to.
- b. There seem to be cases where a DP *can't* have scope over positions that it *should* be able to move to.

(And there are type-shifting accounts that are able to capture *some* of the parallels above...
...all the parallels above show is that ‘long-distance dependencies’ and scope share some of the same mechanisms... *but that mechanism isn't obviously ‘movement’...*)

3. Some Challenges to the Movement Account

We will now take a look at some challenges that the movement account faces. Interestingly, while the type-shifting account seems to be immune to one of these challenges, it isn't obviously immune to all of them...

3.1 DPs Scoping Out of Subjects

Consider the sentence in (38a); it seems to have the T-conditions in (38b).

(38) **A DP Scoping Out of the Subject**

- a. An apple in every basket was rotten.
- b. **For every x**, if x is a basket, then **there is a y** such that y is an apple in x, and y was rotten.

In order to derive the observed T-conditions in (38b), the movement-account must (it seems) allow for the LF in (39a) to be derived from the SS in (38a)....

... However, as illustrated in (39b), general principles of movement are generally taken to preclude extraction from subjects.

(39) **Necessary Appeal to Illicit Extraction From Subjects**

- a. The LF that Reading (38b) Requires:
[every basket [1 [[an apple in t_1] [was rotten]]]]
- b. Extraction from Subjects is Generally Impossible
* Every basket, an apple in was rotten.

(40) **The Solutions (for the Movement Account)**

- a. Conclusion 1:
Maybe, for some reason, subjects don't function as islands for *covert* movement?
Problem: At the moment, it's an unprincipled, stipulative weakening of the theory of movement.
- b. Conclusion 2:
Maybe the DP in (38a) isn't moving **out** of the subject, but only to the **edge** of the subject? (See Heim & Kratzer (1998: 230-235))
Problem: This will still not result in an interpretable structure, unless you assume some kind of type-shifting of *every basket* takes place.
... in which case, why not suppose that such type-shifting rules also account for sentences like (1)...

3.2 DPs Scoping Out of Finite Clauses

(41) **Observation 1: Overt Movement from Finite Clauses is Easy**

English readily allows for phrases to be overtly moved out of finite clauses.

- a. Dave, I knew that Mary liked.

(42) **Observation 2: Scoping Out of Finite Clauses is Hard**

Generally speaking, it's 'hard' for a sentence containing a DP inside a finite subordinate clause to receive an interpretation where the DP has scope above the subordinate clause.

- a. Sentence: I knew that Mary liked no boy.
- b. Impossible Reading: There is no x such that x is a boy and I knew Mary liked x.

(43) **Observation 3: Scoping Out of Non-Finite Clauses is Easier**

Generally speaking, it's not very difficult for a sentence with a DP inside a *non-finite* clause to receive an interpretation where the DP has scope above the clause.

- a. Sentence: I wanted Mary to kiss no boy.
- b. Possible Reading: There is no x such that x is a boy and I wanted Mary to kiss x.

(44) **The Challenge (for the Movement Account)**

If the reading in (43b) of (43a) is generated via covert movement of the DP *no boy* to a position above the matrix subject...

... and if such movement from a *finite* clause as in (41a) is possible in general...

... then **why isn't (42b) a possible reading for (42a)??**

(45) **Solution (for the Movement Account)**

Maybe, for some reason, covert movement can't take place across finite clauses?

Problem: At the moment, it's an unprincipled, stipulative weakening of the theory of movement.

3.3 DPs Scoping Below Negation

A classic observation about sentences like (46a) is that they are ambiguous, and admit of both the readings in (46b) and (46c).

(46) **Scoping Above and Below Negation**

- a. Dave didn't see a dog.
- b. 'Wide Scope' Reading of A Dog
There is an x such that x is a dog and Dave didn't see x.
(True if there is some particular dog – Snoopy – which Dave didn't see...
Consistent with there being other dogs Dave *did* see...)
- c. 'Narrow Scope' Reading of A Dog
It is not the case that there exists an x such that x is a dog and Dave saw x.
(True only if Dave didn't see *any* dog...
Inconsistent with there being any dog seen by Dave...)

(47) **Key Observation 1**

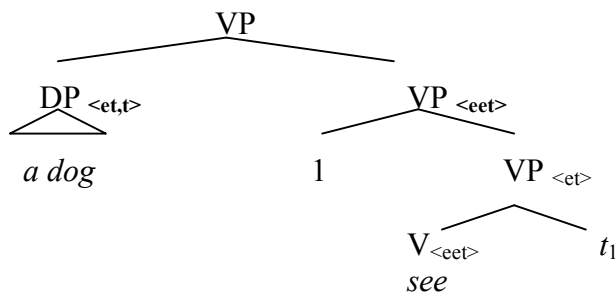
The movement account easily predicts the ‘wide scope’ reading in (46b).

- a. Possible LF for (46a) $[[[a \text{ dog }] [1 [\text{Dave didn't see } t_1]]]$
- b. T-Conditions Assigned to (46a):
There is an x such that x is a dog and Dave didn't see x .

(48) **Potential Problem**

How does the movement account generate the ‘narrow scope’ reading in (46c)?

- To generate the ‘narrow scope reading’, the DP *a dog* has to be in a position where it is in the scope of *not*.
- However, simply moving the DP to a position internal to the VP won't result in an interpretable structure (without type-shifting).



(49) **Minor Observation**

Our type-shifting rule in (3) predicts the existence of the ‘narrow scope’ reading in (46c).
(...however it doesn't predict the ‘wide scope’ reading...)

Sample Derivation

- a. $[[\text{Dave didn't see a dog }]] = T \text{ iff}$ (by FA)
- b. $[[\text{didn't see a dog }]] (\text{Dave}) = T \text{ iff}$ (by FA, LC, notation)
- c. $[[\text{see a dog }]] (\text{Dave}) = F \text{ iff}$ (by FA, notation)
- d. $[\lambda x : \text{there exists a } y \text{ such that } y \text{ is a dog and } x \text{ saw } y] (\text{Dave}) = F \text{ iff}$
- e. It is not the case that there exists a y such that y is a dog and Dave saw y .

(50) **Possible Solution: Movement of *Neg*? (Chierchia & McConnell-Ginet 2000)**

Perhaps it's possible to covertly move negation from the clause-internal position to some position above *a dog*?

a. The (Vaguely) Imagined LF for (46c)

[not [[a dog] [1 [Dave saw t_1]]]]

If we suppose that 'not' in this position receives the same meaning as *it is not the case that*, then we might be able to derive the T-conditions in (46c).

Problems:

- This analysis requires some significant adjustment to our theory of movement: (The following points will be most clear to those with some syntax background:)
 - (i) The movement of *not* in (50a) seems not to leave a trace, which is otherwise expected of movement.
 - (ii) The movement of *not* in (50a) would seem to violate the so-called 'Head Movement Constraint' in syntax.

... a solution that's more commonly accepted nowadays trades on the following, now-common view regarding the syntax of subjects...

(51) **VP-Internal Subject Hypothesis**

- a. The subject of a sentence is initially generated in a position *inside* the VP (below negation, and any adverbs or auxiliaries).

Base Structure of "Obama doesn't smoke"

[does [not [_{VP} **Obama**₁ smoke]]]

- b. In English, the subject must be moved outside of the VP before the pronunciation of the sentence is determined.

Surface Structure of "Obama doesn't smoke"

[**Obama**₁ [1 [does [not [t_1 smoke]]]]]

(52) **New Semantics for *Not***

Under the syntactic proposal in (51), a VP is now of type t . Consequently, we must employ the following semantics for sentential negation:

$$[[\text{not}]] = [\lambda p_t : p = F]$$

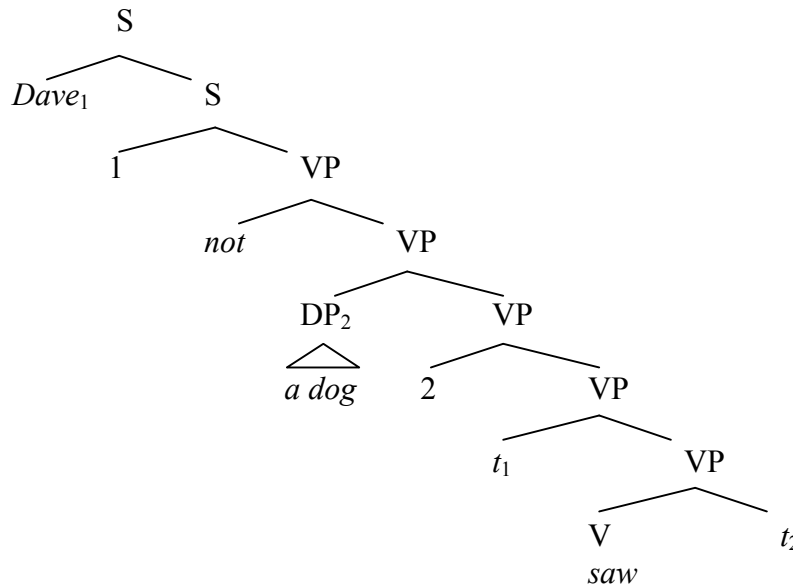
Exercise to the reader: confirm that this semantics for *not* will assign the correct T-conditions to the LF in (51b).

(53) **Solution to (48): Covert Movement to VP**

a. Key Assumption

Let us assume that a direct object can covertly move to VP, just below negation; that is, let us assume that (46a) can have the LF below.

b. A New LF for (46a):



c. Key Observation:

The LF in (53b) will be assigned the ‘narrow scope’ T-conditions in (46c).

(54) **Criticism (for the Movement Account)**

The postulated covert movement in (53b) cannot occur overtly (*cf.* our earlier criticism of the movement analysis of inverse scope).

- a. * Dave didn't a dog see.

(55) **An Overall Criticism of the Movement Account**

In order for the movement account to capture basic features of the semantics of English, it must assume that covert movement differs in crucial respects from overt movement:

Properties of Covert, but Not Overt Movement:

- a. Subjects are not islands for covert movement (*maybe*)
- b. Covert movement (of quantificational DPs) cannot apply across finite clauses
- c. Covert movement can target VP [and possibly NP (Heim & Kratzer 1998: 221)]
- d. Covert movement can adjoin multiple DPs to S

Nowadays, linguists are comfortable with these assumptions, but we should never forget that *they represent a weakening of the theory of movement...*

...so remember the funny properties in (55) the next time you or someone you love is inclined to criticize type-shifting accounts for 'having too many weird rules'...