1 Type shifting and quantifier scope ambiguity

In class we discussed two ways to ‘repair’ the type-mismatch that we end up with when a quantified noun phrase (QNP) appears in object position: we can either shift the type of the quantifier (or that of the verb; we’ll just consider the first option here), or we can assume a syntactic level of Logical Form, in which all quantifiers are sisters to constituents of type $\langle e, t \rangle$. We will talk a lot more about the second option next week; for this week’s assignment, I want you to consider the first hypothesis a bit more in light of some new data.

The basic proposal is the following. A quantificational determiner $Q$ has the semantic type $\langle \langle e, t \rangle, t \rangle$ in subject position with the interpretation in (1a), and the type $\langle \langle e, t \rangle, \langle e, \langle e, t \rangle \rangle, \langle e, t \rangle \rangle$ in object position with the interpretation in (1b). Here the value of $Q$ in the truth conditions depends on the quantifier: for every, $Q = \text{‘every’}$, for some, $Q = \text{‘at least one’}$, etc.

\[
\begin{align*}
(1) \quad a. \quad [Q_{\text{subj}}] &= [\lambda f \in D_{\langle e, t \rangle} [\lambda g \in D_{\langle e, t \rangle} \text{for } Q x \text{ such that } f(x) = 1, g(x) = 1]] \\
\quad b. \quad [Q_{\text{obj}}] &= [\lambda f \in D_{\langle e, t \rangle} [\lambda g \in D_{\langle e, \langle e, t \rangle \rangle} [\lambda y \in D_e. \text{for } Q x \text{ such that } f(x) = 1, g(x)(y) = 1]]]
\end{align*}
\]

1. Show how this analysis derives the truth conditions for (2). (Here and below, be sure to say explicitly what lexical entries you are using for the quantifiers, and feel free to treat foreign dignitary as a unit, i.e., as denoting the type $\langle e, t \rangle$ expression $[\lambda z \in D_e. z \text{ is a foreign dignitary}]$.)

(2)

\[
\begin{array}{c}
\text{Kim} \\
\text{accompanied} \\
\text{\quad every \quad foreign dignitary}
\end{array}
\]

2. Now consider (3), which is just like (2) except that the subject is now also a QNP. It is also ambiguous: its truth conditions can be paraphrased either as in (4a) or as in (4b). (You should be able to convince yourself that these are not equivalent.) This is an example of a ‘quantifier scope ambiguity’.

(3)

\[
\begin{array}{c}
\text{two aides} \\
\text{accompanied} \\
\text{\quad every \quad foreign dignitary}
\end{array}
\]
(4)  a. Two aides are such that they accompanied every foreign dignitary.
    b. Every foreign dignitary is such that s/he was accompanied by two (possibly different) aides.

Do our assumptions about quantifier types in (1) predict the ambiguity of (3)? In other words, do our assumptions derive two sets of truth conditions for (3) which are equivalent to the paraphrases in (4a-b)? Show the crucial part(s) of the semantic derivation of (3) that does or does not give us the outputs we want. You may abbreviate anything that is the same as what you did for (2), but be sure to go through any new bits of semantic derivation, in particular the integration of the quantificational subject into the structure.

3. If our current assumptions do not derive this ambiguity, how would we need to modify them in order to do so? Try to come up with as specific a proposal here as possible, though if you have a hard time figuring out the technical details, then at least try to say as clearly as possible how we might proceed. Can we account for this sort of ambiguity while still maintaining the hypothesis that quantifiers are interpreted in their surface structure positions? What sort of additional predictions might such an account generate, in particular about possible semantic types for quantifiers and potential scope interactions between other quantifiers in other syntactic configurations?

2  The semantics of movement

In class, we made the following syntactic and semantic assumptions about movement:

1. The syntax of movement
   Movement of XP out of YP results in a structure of the form in (i), where i is an index:

   (i)\[
   \begin{array}{c}
   \text{XP} \\
   \text{YP} \\
   \vdots \ldots \vdots \\
   \end{array}
   \]

2. Predicate Abstraction
   If α is a constituent of the form in (ii), where i is an index and β is any constituent, then for any assignment g, \( [\alpha]^g = \lambda x \in D_c.[\beta]^g[\rightarrow x]. \)

   (ii)\[
   \begin{array}{c}
   \text{i} \\
   \text{β} \\
   \end{array}
   \]

   In Chomsky’s Lectures on Government and Binding and a lot of subsequent work in syntax it was assumed that it was impossible (for various syntactic reasons) to move a phrase from one theta position to another. For example, a structure like (5), in which the object of a transitive verb raises to subject position, is supposed to be
ungrammatical because it violates the Theta Criterion: *George receives two theta roles from the verb, but it’s only supposed to receive one.

(5) *

\[
\begin{array}{c}
\text{George} \\
1 \\
theta \\
admires t_1
\end{array}
\]

Among other things, the various constraints that rule out structures like (5) are supposed to explain why *George admires cannot mean *George admires himself.

1. What does the semantic theory we have been constructing have to say about these matters? In particular, what does it predict about movement from one theta position to another vs. movement from a theta position to a non-theta position? Does it make any broader predictions about the types of movement we should/should not see in language?

**IMPORTANT:** This question is a bit vague on purpose — one of your first tasks (maybe the hardest part of the problem) should be to make precise exactly what is meant by ‘theta position’. Keep in mind that while we want to disallow movements like the one in (5), we do want to allow movement of e.g. the objects of passive or unaccusative verbs to subject position, as well as movements of the sort we have been discussing in class (movement of a wh-pronoun, quantifier raising, etc.).

2. One potential counterexample to the claim that structures like (5) are impossible comes from verbs like *bathe, which seem to have exactly the meaning that (5) doesn’t have when they show up with only one argument: (6b) (only) means *Dick bathed himself.*

(6) a. Dick bathed George.
    b. Dick bathed.

Given your conclusions in Part 1, what can you say about verbs like *bathe?*