The semantics of movement

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

1. The syntax of movement
   Movement of $\mu$ out of $\beta$ results in a structure of the form in (i), where $i$ is an index and $\#_i$ is an unpronounced copy of $\mu$ (a “trace”).

   \[
   \begin{array}{c}
   \mu \\
   \text{i} \\
   \beta
   \end{array}
   \]

2. Predicate Abstraction
   If $\alpha$ is a constituent with daughters $i$ and $\beta$, where $i$ is an index and $\beta$ is any constituent, then for any assignment $g$, $[\alpha]^g = [\lambda x \in D_e. [\beta]^g[i \rightarrow x]]$.

3. The interpretation of copies
   For any copy $\#_i$ and assignment function $g$, $[\#_i]^g = g(i)$.

This week’s assignment explores some of the implications of these assumptions. Before you get started, you should make sure that you feel comfortable doing the derivation on p. 115 of Heim and Kratzer. If you don’t, make sure you go to section on Friday.

1 The Theta Criterion again

In Chomsky’s *Lectures on Government and Binding* and a lot of subsequent work in syntax it is assumed that it is impossible (for various syntactic reasons — the Theta Criterion, principles of case assignment; take your pick) to move a phrase from one theta position to another. For example, a structure like (1), which is intended to represent movement of the object of a transitive verb to subject position, is supposed to be ungrammatical because it violates (one formulation of) the Theta Criterion: *George* receives two theta roles from the verb, but it’s only supposed to receive one.

\[
\begin{array}{c}
\ast \quad \text{TP} \\
\text{George} \\
\text{i} \\
\text{VP} \\
\text{admires} \\
\text{George}_1
\end{array}
\]

Among other things, the various constraints that rule out structures like (1) are supposed to explain why the surface string corresponding to (1), *George admires*, cannot mean that George admires himself, which is what we would presumably expect if a single NP could be assigned multiple theta roles through movement.
A. 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?

NB: This question is a bit vague on purpose, and 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 (1), 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 relative pronoun, etc.).

B. One potential counterexample to the claim that structures like (1) are impossible comes from verbs like bathe, which seem to have exactly the meaning that (1) doesn’t have when they surface with only one argument: (2b) (only) means Dick bathed himself.

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

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

2 Long distance movement in relative clauses

A well-known syntactic fact about wh-movement in relative clauses is that the wh-pronoun can move quite far: as shown by (3a-d), an indefinite number of intervening CP boundaries can separate the wh-word from its base position (indicated by _).

(3) a. the book [CP which Kim likes _ ]
   b. the book [CP which I think [CP that Kim likes _ ]] 
   c. the book [CP which I think [CP that Lee said [CP that Kim likes _ ]]]
   d. the book [CP which I think [CP that Lee said [CP that Pat believes [CP that Kim likes _ ]]]]

Research in syntax has convincingly shown that wh-movement is cyclic: when a wh-word moves out of a clause, as in the examples above, it must first stop in the specifier of CP. Syntactic theory also tells us that each instance of movement should leave a trace behind, which means that the structure of e.g. (3c) is really (5) (on the next page; to keep things as simple as possible, I am only providing category labels for the CP nodes).

1. Show that our system as it stands will fail to derive an interpretation for the relative clause structure in (5). Explain in clear and precise terms what goes wrong, showing exactly where the semantic derivation crashes.

2. Propose a solution to this problem, and show how it works by illustrating how you derive the right interpretation for the relative clause in (5). Your solution
may be either syntactic or semantic, but you should fully explore the consequences of your proposal for the set of hypotheses about the syntax-semantics interface that we have built up so far.

(4)

For the purpose of this assignment, assume that sentence embedding verbs like *say*, *think*, etc. are type $\langle t, \langle e, t \rangle \rangle$, with denotations along the lines of (5).

(5) \[
\lambda p \in D_t. [\lambda x \in D_e. x \ said/thinks that \ p = 1]
\]

*This is actually fundamentally wrong* — if you see why, feel free to say so and suggest an alternative — but it is close enough to right for the purposes of this assignment.