## A note on semantic reconstruction

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## 1 Background

- This handout is a digression from Assignment 3, problem 4.
- Semantic reconstruction is a term from the QR literature. It refers to situations in which a phrase is argued to raise to a high position and get interpreted in a lower position.
- The focus here is on the mechanics of how that happens. I'll remain agnostic about whether it happens in language interpretation.
- As usual, we can cast these analyses in the terms of Cooper Storage if we want a compact theory that explicitly tracks all dependencies locally.


## 2 What happens when we move a negation?

We can move negation and other $\langle\langle e, t\rangle,\langle e, t\rangle\rangle$ expressions just like we move noun phrases. Can we get these movements to correspond to scope ambiguities?

### 2.1 Variable of the same type as the moved expression

(1)


The expression on the root node reduces to everyone (not pass), which is exactly what we would have gotten if we'd just left the negation in its original position. We reconstructed the negation to its original position. And we can generalize this further: if we leave a trace of the same type as the original expression, then it will get reconstructed.

### 2.2 Digression: Generalized negation for a wide-scope reading

For assignment 1, you generalized negation to work with any expression that ultimately maps to $t$. Thus your grammars contain negations that look like this:
a. $\quad \neg_{t}:\langle t, t\rangle$
b. $\quad\left\|\neg_{t}\right\|^{\mathrm{M}}=[\mathrm{T} \mapsto \mathrm{F}, \mathrm{F} \mapsto \mathrm{T}]$

$$
\begin{array}{ll}
\text { a. } & \neg_{\langle\langle\langle e, t\rangle,\langle e, t\rangle\rangle, t\rangle}:\langle\langle\langle\langle e, t\rangle,\langle e, t\rangle\rangle, t\rangle,\langle\langle\langle e, t\rangle,\langle e, t\rangle\rangle, t\rangle\rangle  \tag{3}\\
\text { b. } & \neg_{\langle\langle\langle e, t\rangle,\langle e, t\rangle\rangle, t\rangle}=\lambda X \lambda R \neg_{t}(X R)
\end{array}
$$

We can use this in place of not at the top of the above tree:


The root of this tree doesn't have the type we want, but we could borrow a trick from the continuations literature and feed in an identify function. If we do that, then we get the desired outcome!

If a syntactician told me that this head movement absolutely had to leave an interpreted trace and achieve the desired semantic wide-scope, then this is the analysis I'd offer.

## 3 Semantic reconstruction of quantifiers

There are two ways of completing the following tree, with each solution determined by the type one chooses for $Q$. (I've printed two copies so we can fill out the two ways.)
(5)

(6)


