

# Exploring theories of scope-taking

Chris Potts, Ling 230b: Advanced semantics and pragmatics, Spring 2018

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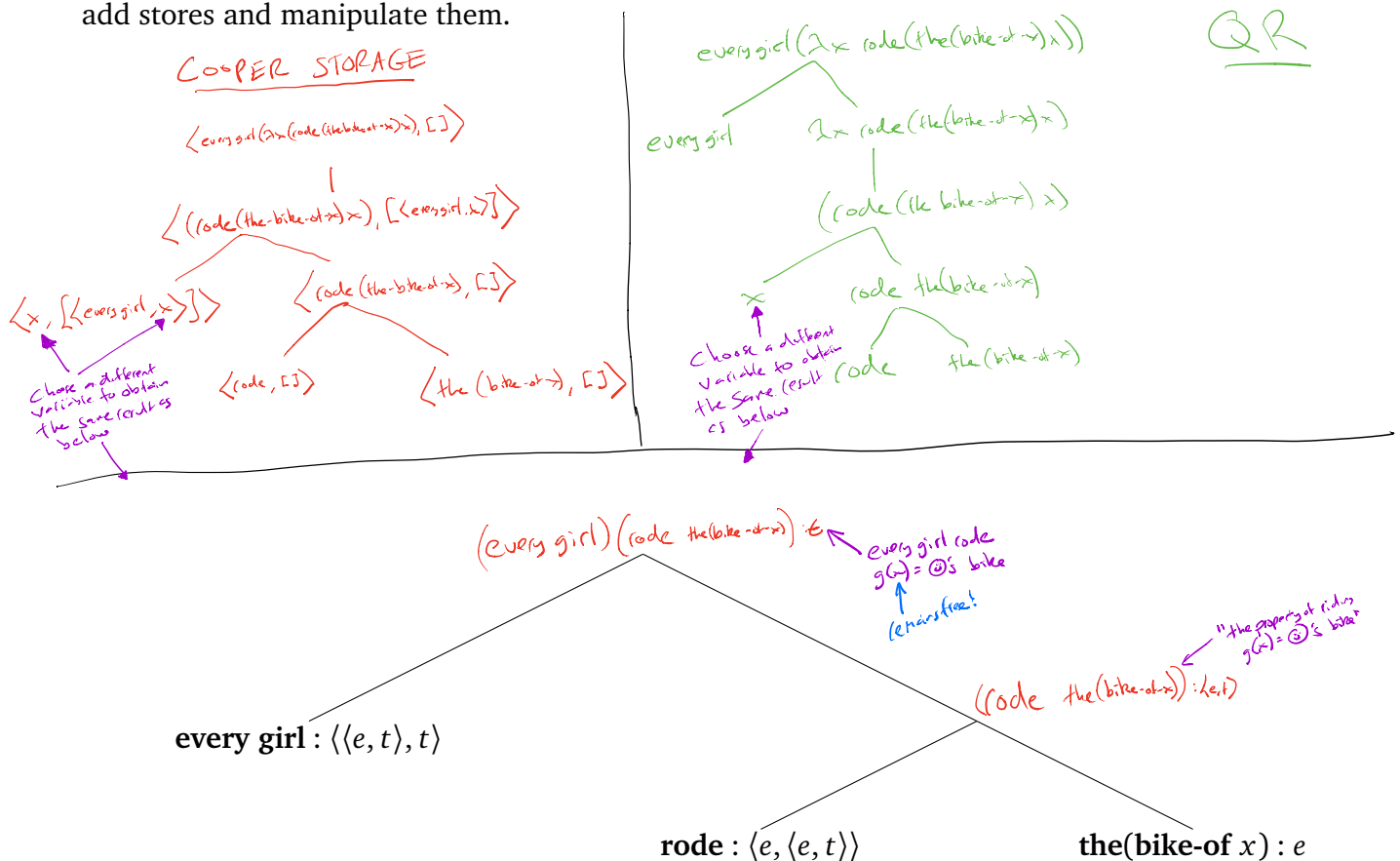
## 1 Binding from subject position

Consider sentences like *Every girl rode her bike*, where the subject quantifier binds the pronoun *her*. How do the theories of QR and Cooper Storage capture this binding relationship?

We'll assume this very rudimentary theory of phrases like *her bike*:

- (1) **bike-of** =  $\lambda y (\lambda z (\text{own } z \ y) \wedge (\text{bike } z))$
- (2)  $\llbracket \text{the} \rrbracket^{\mathbf{M},g} = \text{the } T \in D_{\langle \langle e,t \rangle, e \rangle} \text{ such that, for all } f \in D_{\langle e,t \rangle}, T(f) \text{ is defined iff } |\{x : f(x)=T\}| = 1.$   
Where defined,  $T(f) = \text{an entity } d \in D_e \text{ such that } f(d) = T.$
- (3)  $g : [x \mapsto \odot, y \mapsto \odot, z \mapsto \odot]$

And here's an interpretable tree. For QR, we can move things around. For Cooper Storage, we can add stores and manipulate them.



## 2 Split readings

The following examples are discussed by Potts 2000 (<http://babel.ucsc.edu/Jorge/>):

(4) The company need fire no employees.

- a.  $\neq$  the company is obligated to fire no employees (de dicto)
- b. = there are no employees  $x$  such that the company is obligated to fire  $x$  (de re)
- c. = it is not the case that the company is obligated to fire employees (split)

The first is blocked because *need* has to have a negation scoping over it. Compare with *must*. To see the difference between the de re and split readings, suppose there is no particular employee that the company has to fire (as would be the case, for example, if one of them had been found guilty of a crime), but that the company does have to make a layoff. Then the de re reading is true but the split reading is false. On the other hand, the split reading entails the de re reading: if the company can get away with no firings, then there is no particular person it is obliged to fire.

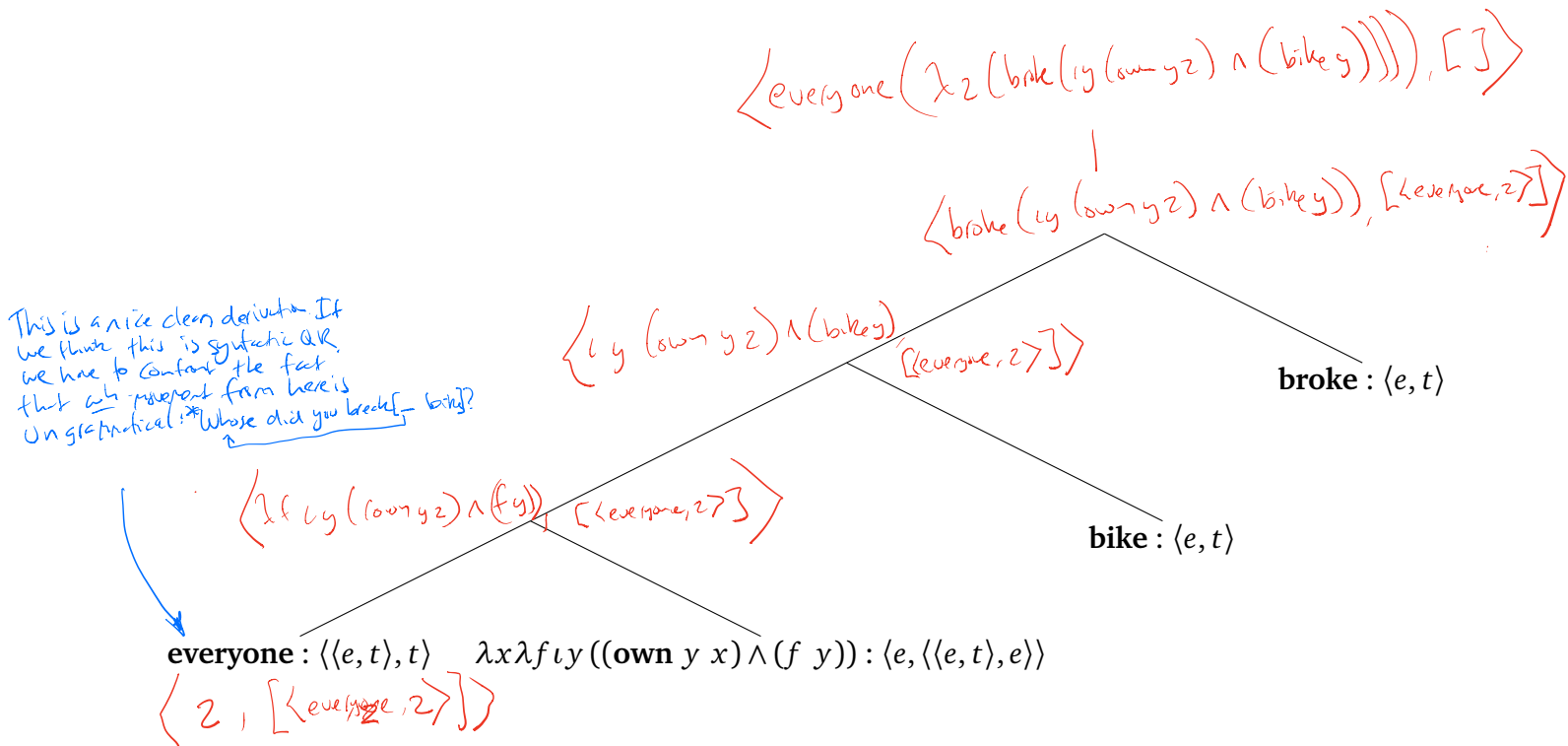
How should we account for these readings?

### 3 Possessive quantifiers

Work out a basic semantics for sentences like *Everyone's bike broke* using the basic theory of the possessive in (5), quantifier raising or Cooper Storage, and the following initial structure. (If you work this out, see if your account also allows for binding, as in *everyone's bike embarrassed her*.)

$$(5) \quad 's = \lambda x \lambda f \iota y ((\text{own } y x) \wedge (f y)) : \langle e, \langle \langle e, t \rangle, e \rangle \rangle$$

Where  $\llbracket \iota x \varphi \rrbracket^{M,g} = \text{the unique } d \in D_e \text{ such that } \llbracket \varphi \rrbracket^{M,g[x \mapsto d]} \text{ if there is one, else undefined}$



## 4 Scope and negation

Provide a compositional account of the ambiguity summarized in (6):

- (6) Every student didn't pass.
- a. *Surface*: for all students  $x$ ,  $x$  did not pass
  - b. *Inverse*: it is not the case that, for all students  $x$ ,  $x$  passed

There are a number of methods we can use to capture these ambiguities. See the handout on semantic reconstruction for a solution that involves moving the negation, and another that depends on local movement of the subject followed by full QR, with the ambiguity then derived based on the type of the variable that the quantifier "binds".

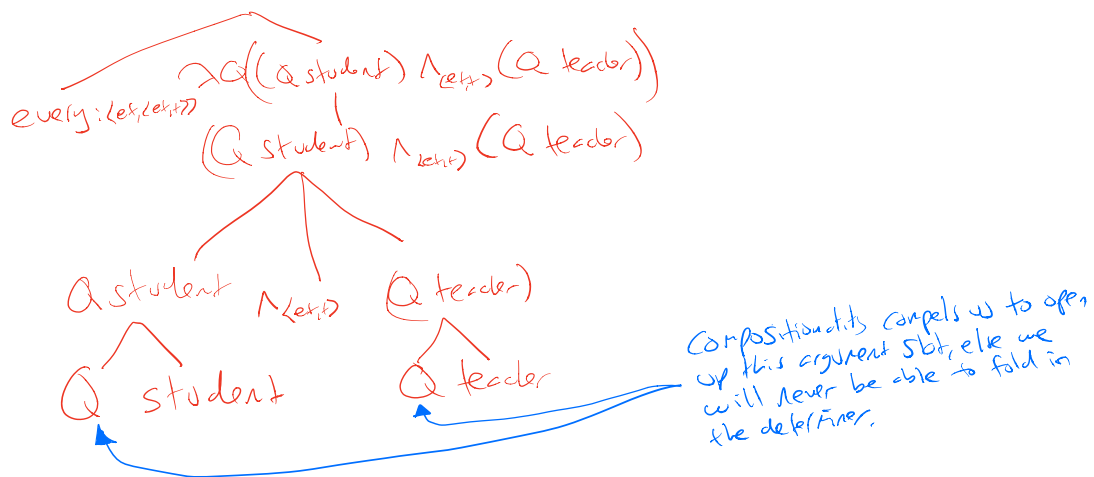
## 5 Coordinated quantifiers

The sentences in (7) share a reading that we might represent as

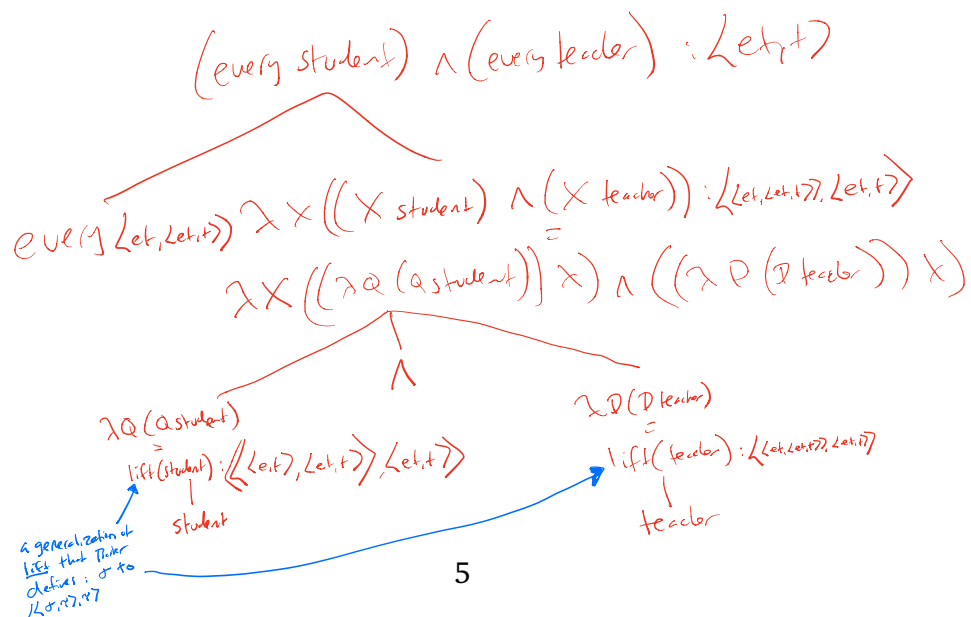
$$((\text{every student}) \text{ clap}) \wedge ((\text{every teacher}) \text{ clap})$$

What compositional challenge does this pose assuming the constituent structure indicated by square brackets?

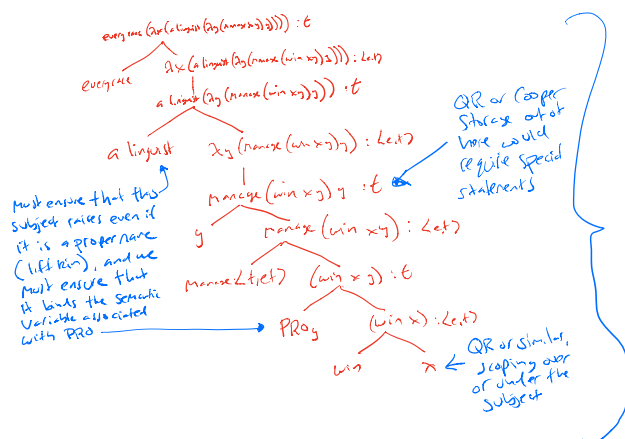
- (7) a. [[Every student] and [every teacher]] clapped. ← easily captured via the generalized conjunction for assignment 1.  
 b. [Every [student and teacher]] clapped.



Thanks to Alec and Michael for pointing out this analysis to me:



## Infinitival complements, PRO, and scope



This is at least an outline of an account based in PRO with obligatory control.

manage: Let, et)  
 $\{manage\} \lambda f \lambda x (fx)$

Can be seen as  
encoding obligatory  
control

3 The CUX of an account based in individual VPs as properties, rather than propositions

