Relative clauses

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Do we face von Stechow's problem for pied-piping in relatives?

1 Null operator theory

Let's start by defining a new type constructor:

(1) $\mathtt{R\ a} := \mathtt{e} \to \mathtt{a}$

The relative operators is an inhabitant of $\mathtt{R\ e}$ (an identity function):

(2) $Op_{Rel} := \lambda x\ .\ x$ $\mathtt{R\ e}$

We can shift a relative operator into a scope taker via a shifter we can call Q_{Rel}.[1]

[1] This is a flipped version of the `fmap` of the `Reader` functor.

(3) $Q_{Rel}\ m := \lambda k\ .\ \lambda x\ .\ k\ (m\ x)$ $\mathtt{R\ a} \to (\mathtt{a} \to \mathtt{b}) \to \mathtt{R\ b}$

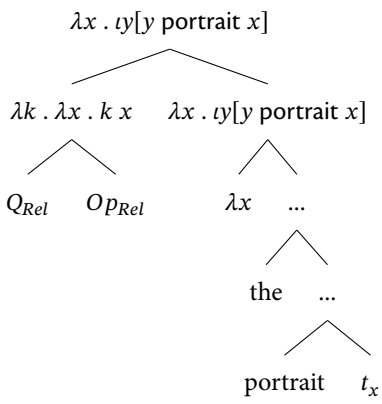
Now we have everything we need to get simple pied-piping:

(4) Mary met the man [[the portrait of whom] John bought].

1.1 Composition via QR

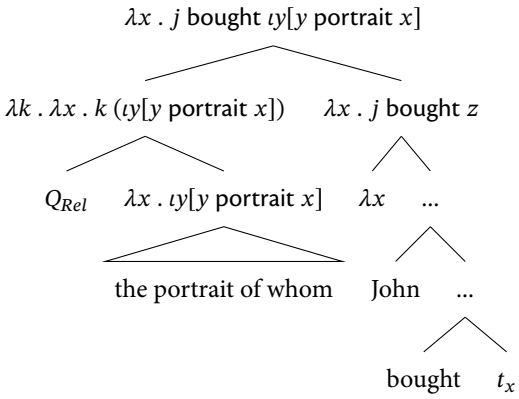
Let's start with the composition of the pied-piped DP – we shift the relative operator to a scope-taker via Q_{Rel}, and scope it to the edge:

(5)



Now we shift the result into a scope-taker via Q_{Rel}, and scope it to the edge of the relative clause, returning a derived predicate:

(6)



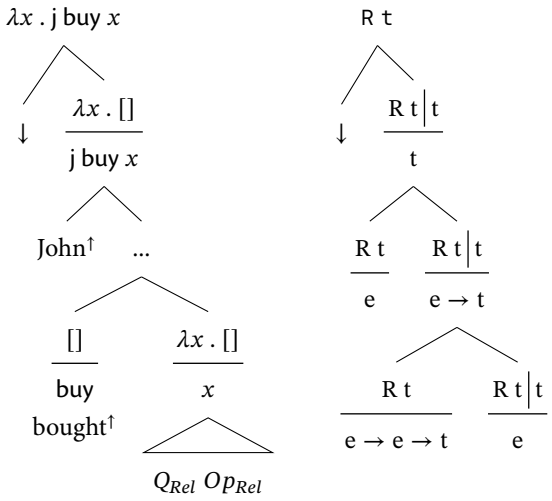
1.2 Composition via (indexed) continuations

We can think of the result of applying Q_{Rel} as a tower, in Barker & Shan's (2014) terms.

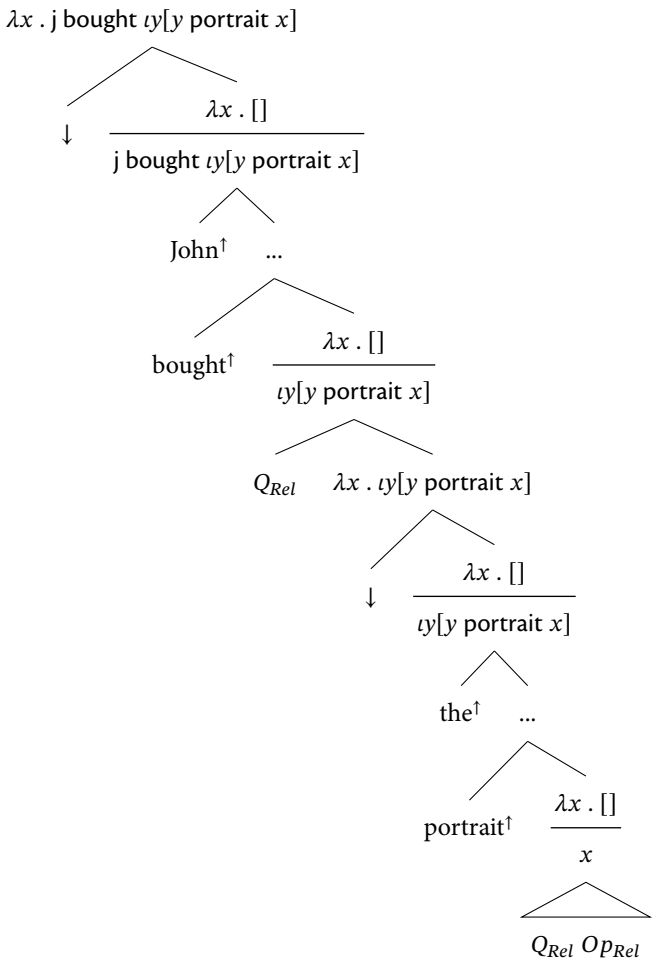
(7) $Q_{Rel}\ Q_{Op} = \dfrac{\lambda x\ .\ []}{x}$ $\qquad\qquad$ $\dfrac{\mathrm{R\ b} \mid \mathrm{b}}{\mathrm{e}}$

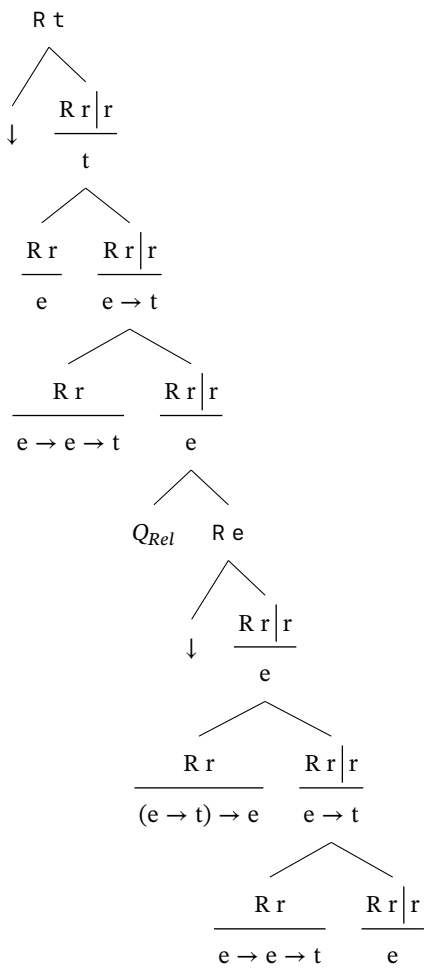
Composition may now proceed *in-situ* via *lift* and *scopal function application*.

(8) That John bought.



(9) The portrait of whom John bought.





References

Barker, Chris & Chung-chieh Shan. 2014. *Continuations and natural language* (Oxford studies in theoretical linguistics 53). Oxford University Press. 228 pp.