QR is restrictor sharing

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1 Core data

- *Split antecedence* (Perlmutter and Ross 1970)

(1) A man entered the room and a woman went out [who were quite similar].

- Here, the extraposed relative *who were quite similar* cannot restrict *a man* or *a woman*, but rather restricts a set of man-woman pairs. How do we arrive at such a meaning compositionally?
- *Hydras* (Link 1984)

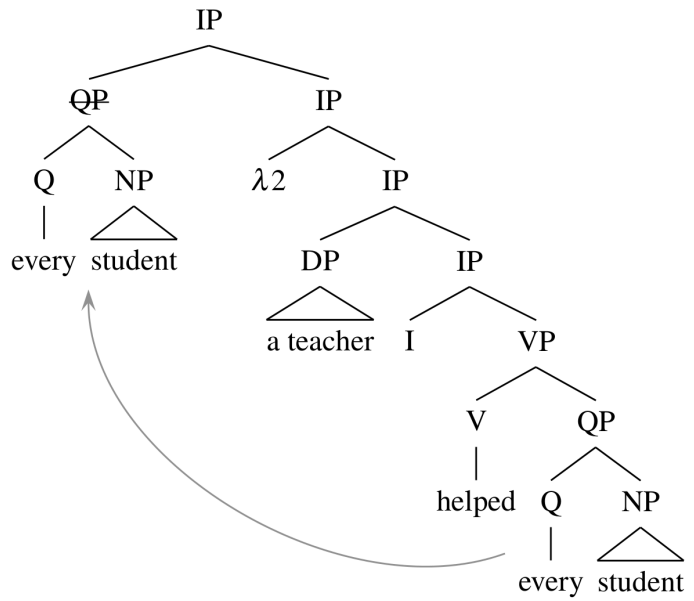
(2) Every man and every woman [who met at the party] left.

- Again, the relative *who met at the party* restricts a set of man-woman pairs.

2 Background on Quantifier Raising

- A standard, copy-theoretic conception of QR:
  - On the syntactic side, it:
    - Merges a copy of the QP into a new position.
    - Renders the higher copy unpronounced.
  - On the semantic side, QR:
    - Turns the lower copy into a *restricted variable*.
    - Makes the higher copy bind that variable.

(3)



- The makes the correct prediction that the restrictor should be interpreted in the lower copy (disjoint reference effects):

(3) * She$_1$ helped every student of Janes$_1$.

- The lower copy comes to denote a restricted variable via "trace conversion" (Fox 2002). The lower QP is converted into a bound definite description – importantly, there is independent motivation for allowing bound definites:

(4) A professor from every[2] department will outline the$_2$ department's budget at our next meeting.

2.1 Fox and Johnson's take on Trace Conversion

- Quantificational expressions such as *every student* are just special pronunciations of definite descriptions.
- The definite determiner is exceptionally pronounced as *every* rather than *the*, because it is the *exponent* of a quantificational head that is first-merged in its scope position.

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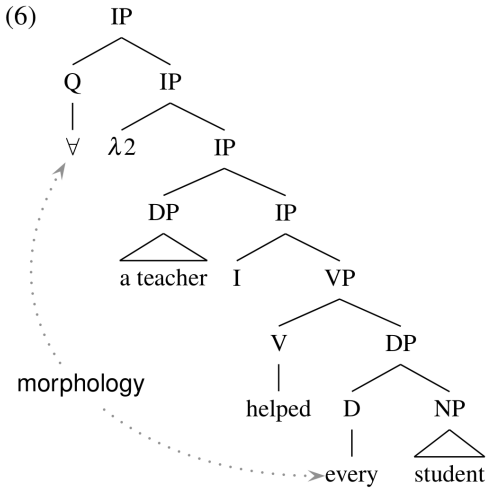

- The quantificational head needs to compose with a restrictor in order to semantically compose, hence we move the NP to (countercyclically) merge with the quantificational head.

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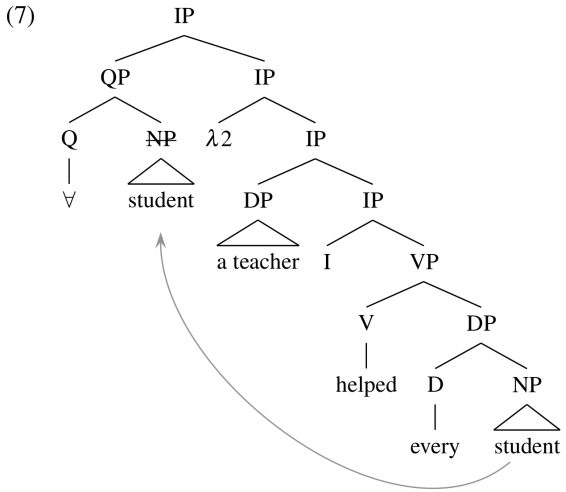

- Following Elbourne (2005), F&J assume that every definite determiner carries an index, in order for it to be bindable by the lambda operator.
- Semantically, a definite determiner indexed n takes a predicate P, and is defined iff $g(n)$ is a P; if defined, it returns $g(n)$.
- Composition may now procede as follows:

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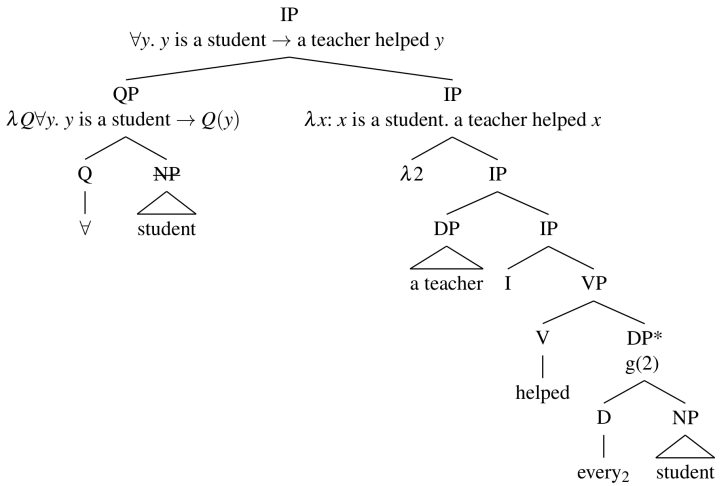
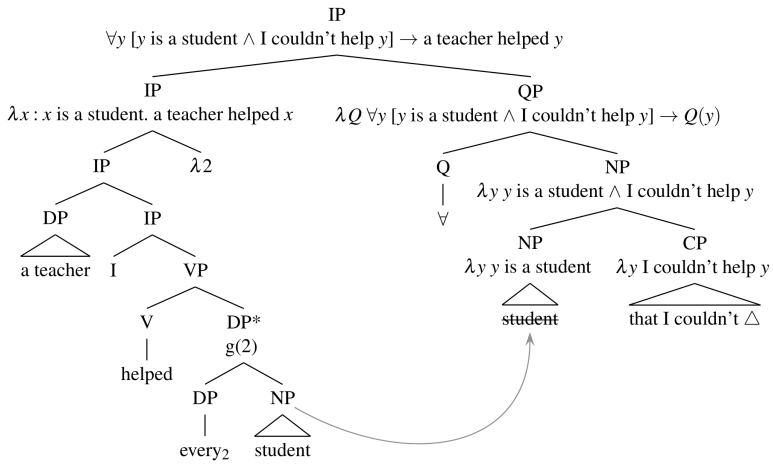


presupposition: DP* (and constituents that dominate it up to the λ abstractor) has a denotation only if g(2) is a student.

(13)



presupposition: DP* (and constituents that dominate it up to the λ abstractor) has a denotation only if g(2) is a student.

2.2 ACD and extraposition

- Under certain conditions, there can be material in the NP part of a QR-ed DP interpreted only in the higher position.

(5) A teacher helped every student that I couldn't Δ.
Δ = [help *x*]

- Crucially, the relative clause is not inside the definite DP pronounced *every student*, and therefore not in the antecedent for the ellipsis it contains.
- This is supported by the following contrasts:

(6) * I [$_{VP}$ said that everyone you did Δ arrived].

(7) I [~VP said that everyone arrived** that you did Δ.

2.3 Linearization

- The last ingredient involves determining which parts of the moved phrase are pronounced.
- The algorithm for doing so is based on Fox (2012), and assumes multidominance representations.

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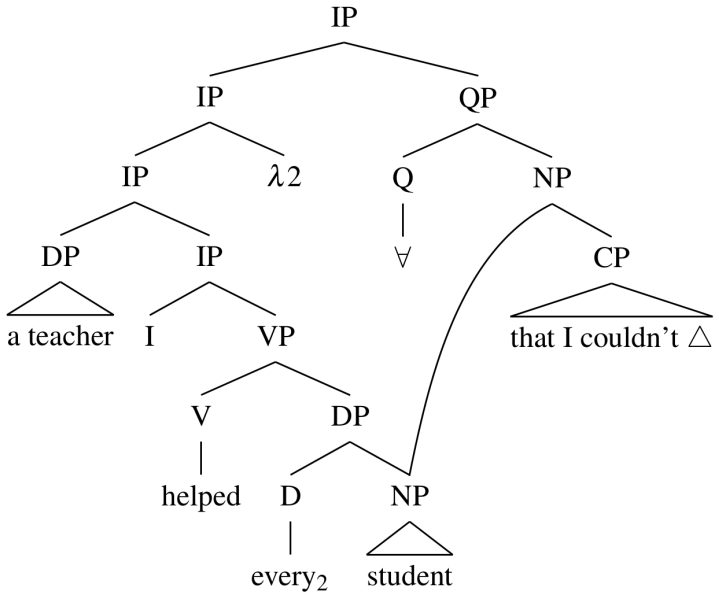


- The syntactic rule for QR:

(8) QR
Let α be the restrictor for D, and β be the restrictor of Q. If D is the exponent of Q then β reflexively dominates α and if β reflexively dominates α then D is the exponent of Q.

3 Extraposed relatives with split antecedents

(9) Every woman is smiling and every man is frowning who came in together.

- F&J observe that (9) means something like (10):

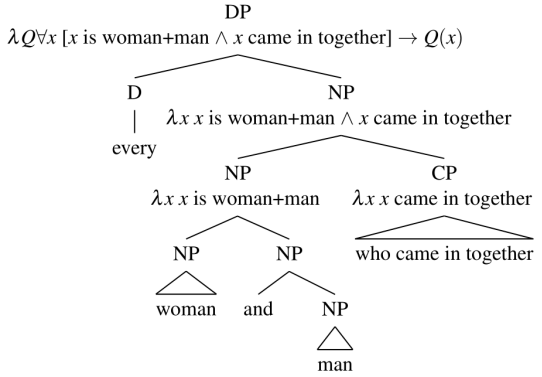
(10) Every woman and man who came in together are smiling and frowning respectively.

- The DP *every woman and man who came in together* can compose via standard mechanisms.

- All we need extra is an entry for *and* that takes two predicates of atomic individual, and returns a predicate that is true of *pairs* (Link 1983, Winter 2001, Champollion 2015).

- Once we have this, everything proceeds as usual.

(20) "woman+man" is shorthand for a predicate that is true of sums of a woman and a man



- F&J suggest that for cases of split antecedents, the two restrictors QR to a higher position, and undergo conjunction via a covert version of pair-formation *and*. The extraposed relative restricts the result.

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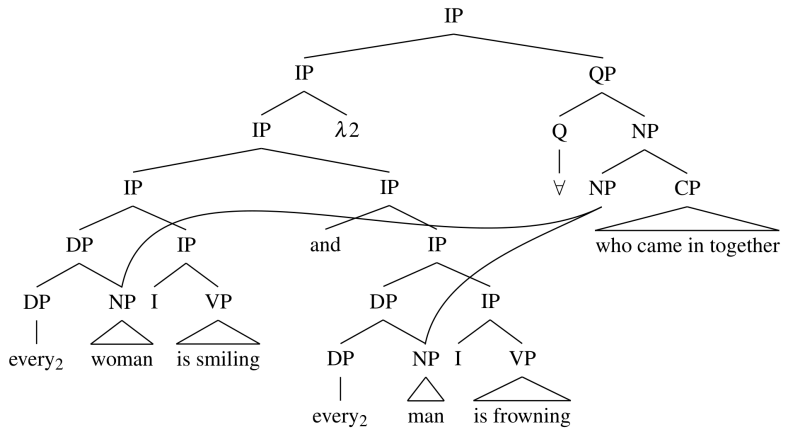


- Note that the two definite determiners *every*$_2$ are *exponents* of the same quantificational head ∀. F&J report that this is a good prediction, based on the fact that when the quantifiers differ, the constructions degrade.

(11) * A woman is smiling and every man is frowning who came in together.
(12) A woman is smiling and a man is frowning who came in together.
(13) * Every woman is smiling and some man is frowning who came in together.
(14) Some woman is smiling and some man is frowning who came in together.
(15) * Most women are smiling and every man is frowning who came in together.
(16) ?Most women are smiling and most men are frowning who came in together.
(17) * Every woman is smiling and few men are frowning who came in together.
(18) Few women are smiling and few men are frowning who came in together.
(19) * No woman is smiling and every man is frowning who came in together.
(20) No women is smiling and no man is frowning who came in together.

- F&J note that there are some apparent exceptions, involving numerals:

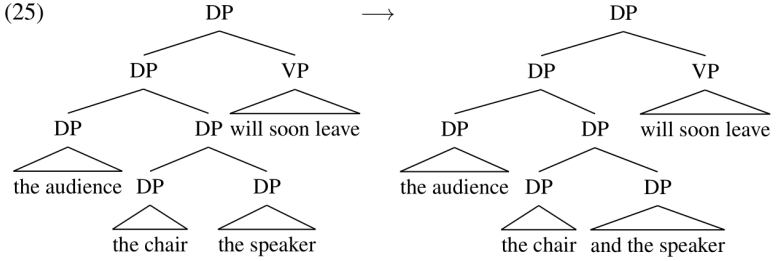
(21) One woman is smiling and other women are frowning who came in together.

(22) One woman is smiling and two men are frowning who came in together.

- One way to reconcile this data with F&J's approach is that the quantifier here is really a *covert* existential determiner. Numerals are simply predicates.

- In order to make sense of the claim that merged NPs can give rise to a *pair* interpretation. F&J assume that English has asyndetic coordination. When this happens overtly, there is a spellout rule which says that *and* must be interpeted in the final conjunct, but *and* itself has no interpretation.

(25)



- As it stands this analysis doesn't quite work – it predicts that cases of split antecedents should be presupposition failures.

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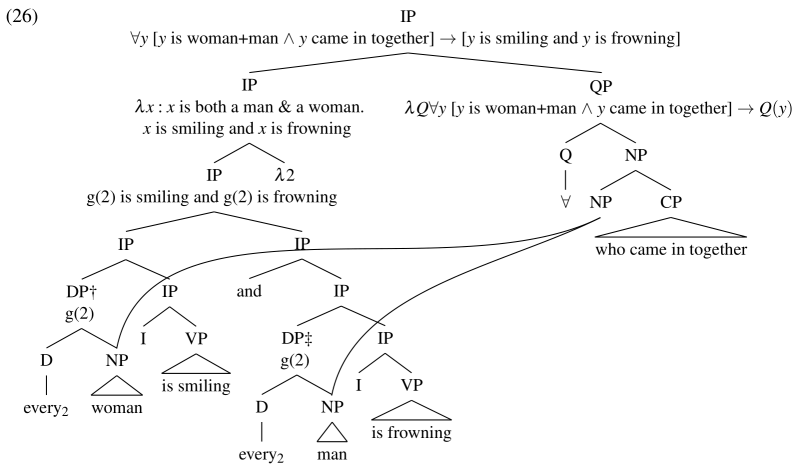
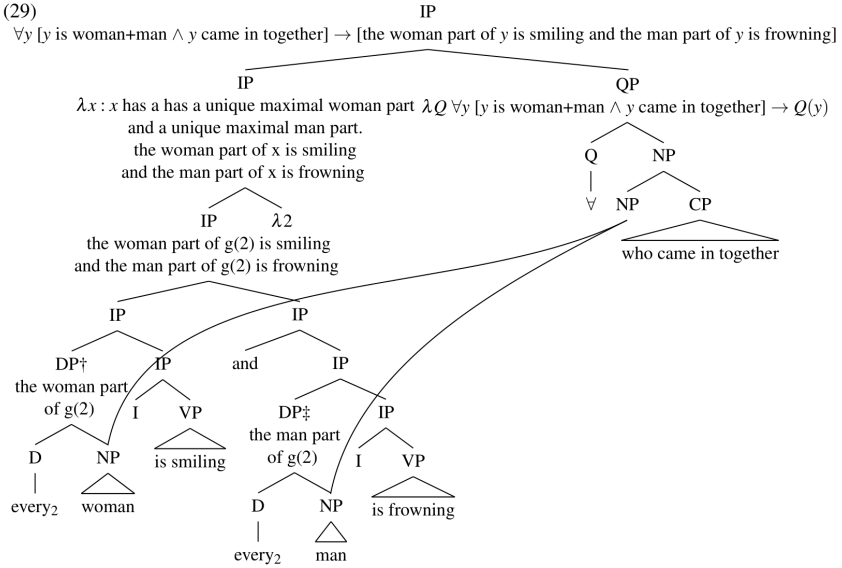


presuppositions: DP† (and constituents that dominate it up to the λ abstractor) has a denotation only if g(2) is a woman.

DP‡ (and constituents that dominate it up to the λ abstractor) has a denotation only if g(2) is a man.

(29)



presuppositions: DP† (and constituents that dominate it up to the λ abstractor) has a denotation only if there is a unique maximal woman part of g(2).

DP‡ (and constituents that dominate it up to the λ abstractor) has a denotation only if there is a unique maximal man part of g(2).

- The presupposition of the definite description must be such that it can be satisfied by a proper subpart of the group referred to by the variable.

(23) A friend of every woman and man who agreed to dance thinks that the woman is better than the man.

(24) $[\![\text{every}_n]\!]^g = [\![\text{the}_n]\!]^g$
$= \lambda P : \exists x[P(x) \wedge \forall x'[P(x') \wedge x' \leq x \rightarrow x = x']]$
$. \iota x[P(x) \wedge \forall x'[P(x') \wedge x' \leq x \rightarrow x = x']]$

4 Hydras

(25) Every man and every woman who'd agreed to dance with each other got out on the floor.

- F&J note that this has the same meaning as (26)

(26) Every man and woman who'd agreed to dance with each other got out on the dance floor.

- F&J's insight is that we have an analysis of (25) already, if we have a way of rendering *every man and every woman* equivalent to *every man and woman*.
- The idea here is that the *every*s here are themselves exponents of the covert definite determiner where *every* is normally exponed.

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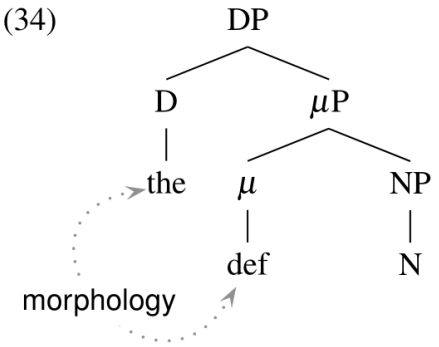


- For English, F&J entertain the following:

(27) μ is always the exponent of D.

- This can't be quite right however, since the shape of μ can also vary based on some higher Q.

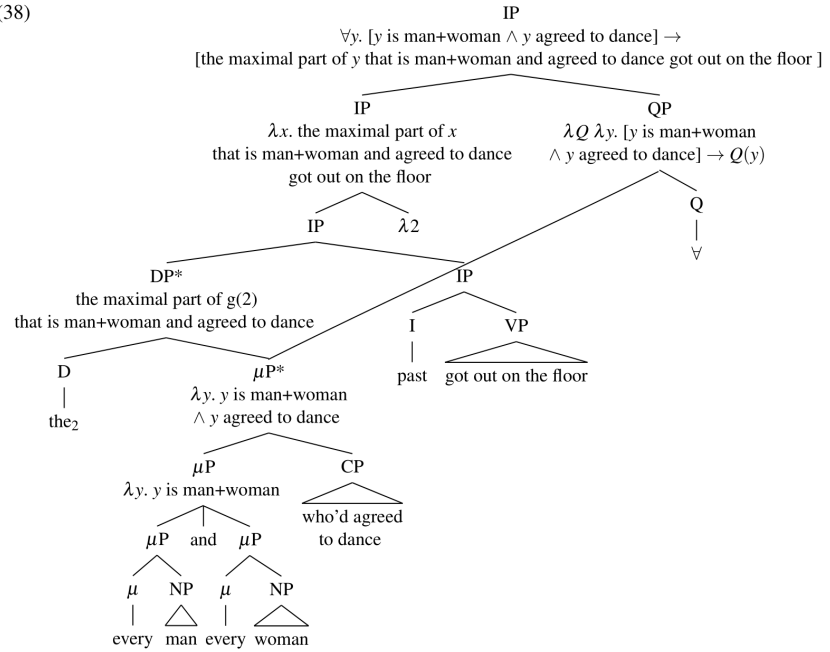
(28) μ is always the exponent of D and Q.

- With this revised syntax, F&J give their final formulation of QR:

(29) QR
If μ is the exponent of both D and Q then a projection of μ is a sister to D and Q and if a projection of μ is a sister to D and Q, then μ is the exponent of both D and Q.

- Here is the final analysis of hydras:

(38)



presupposition: DP* (and constituents that dominate it up to the λ abstractor) has a denotation only if g(2) is man+woman and agreed to dance.

5 Across-the-Board QR

- F&J note that the representation proposed for split antecedents involves ATB QR out of a coordinate structure.
- Bosškovi'{c} and Franks (2000) however argue against the existence of genuine ATB QR, since the following examples don't have a readin where *every* quantifies over the coordination.

(30) Some delegate represented every candidate and nominated every candidate.

(31) Some boy hugged every girl and kissed every girl.

- F&J claim that these examples have an independent problem – the

restrictor of each quantifier is the same, which seems to independently degrade the acceptability of split antecedents.

(32) ?* Every woman is smiling and every woman is frowning who came in together.

…and likewise…

(33) * Every woman and woman who came in together are smiling.

- Apparently, two identical predicates cannot conjoin (note: doesn't this follow from the presupposition of the definite part?). When we control for this, it seems that genuine cases of ATB QR are attested.

(34) Some philosopher or other has praised every dialogue by Plato and trashed every book by Aristotle.
For every dialogue-by-Plato+book-by-Aristotle, there is some philosopher that has praised the dialogue and trashed the book

- Independent evidence that the quantification outscopes the conjunction in cases of split antecedents:

(35) Every man signed the release form or every woman did, who are the child's parents.

6 Extension to *wh*?

- F&J don't explicitly discuss this, but we also get cases of split antecedence with constituent questions:

(36) Which man entered the room and which woman went out who were quite similar.

- Likewise, we can construct *wh* hydras:

(37) Which man and which woman who met at the party left.

- Johnson's (2012) proposal for *wh*-expressions can extend to hydras, just so long as we say that *which* is an exponent of μ.
- For cases of split antecedents, this is much more problematic, since *wh*-expressions *move to their scope position*:

(38) Which man does Bill like and which woman does Frank like who already know each other.

- Since *wh*s are pronounced in their scope position, this must involve conjoined CPs:

(39) [[$_{CP}$ which man does Bill like] and [$_{CP}$ which woman does Frank like]] who came in together

- Unclear where the extraposed relative attaches.

7 Probing the scope of the quantificational head

- Premise (i): extraposition isn't roofed by non-finite clauses:

(40) John [[wanted to talk to the lecturer] badly], who scolded him.

- Now we can probe whether or not the universal does indeed scope out of the conjunction in cases of split antecedents:

(41) John wanted to talk to every linguist and Mary wanted to talk to every philosopher who wrote a book together.

- The attested reading is in-line with the predictions!