Irene Heim (2000): Notes on Interrogative Semantics

1. Questions denote sets of propositions

- The intuition behind Hamblin (1973) and Karttunen (1977)

(1) Is John a student? **YN question**
{that John is a student, that John is not a student}

(2) Is John a student or a professor? **Alternative question**
{that John is a student, that John is a professor}

(3) Which subway line goes to the airport? **Wh-question**
{that the red line goes to the airport, that the blue line goes to the airport, that the green line goes to the airport, that the orange line goes to the airport}

(4) When an interrogative clause ϕ is uttered in a world w, the utterer thereby requests to be told which of the propositions in $[[\phi]]_w$ are true in w.

- Formalizing (3)

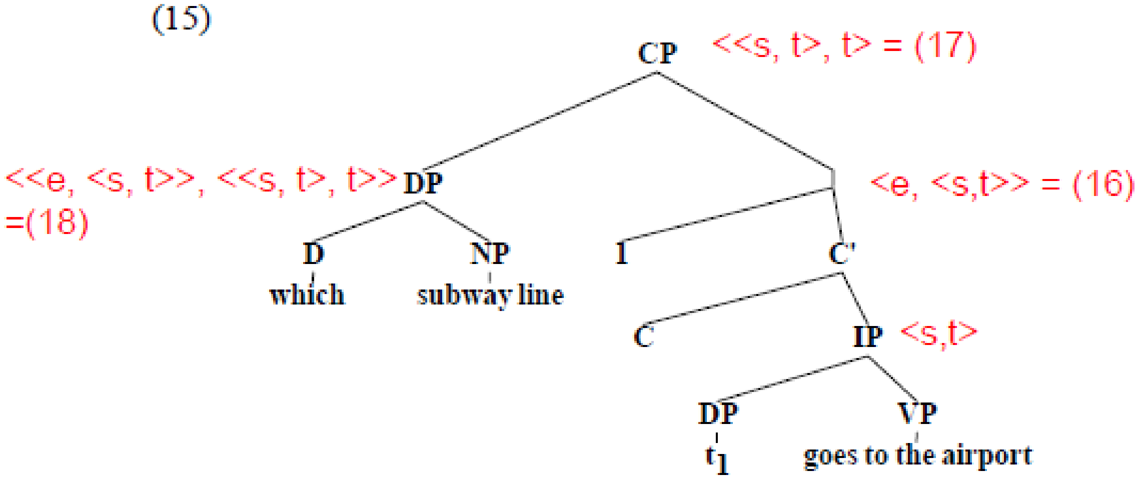
(6) [[Which subway line goes to the airport?]]
$\{p \in D_{<s,t>}: \exists x[x \in \{R, G, B, O\}$ & p = that x goes to the airport$]\}$

= {that x goes to the airport: $x \in \{R, G, B, O\}$} (7)

= $\lambda p \in D_{<s,t>}. \exists x\ [x \in \{R, G, B, O\}$ & p = that x goes to the airport$]$ (14)

2. Compositional interpretation of constituent questions
2.1 First attempt

(15)



(16) For any w,
[[**1. t1 goes to the airport**]]w = λx.x goes to the airport in w.

(17) For any w,
[[**which subway line 1. t1 goes to the airport**]]w
= $\lambda p \in D_{<s,t>}$. ∃x [x is a subway line in w & p = that x goes to the airport] (= 14)

(18) For any w,
[[**which subway line**]]w =
$\lambda P_{<s,et>}. \lambda p_{<s,t>}$. ∃x [x is a subway line in w & p = λw'.P(w')(x)]

(19) [[**which**]] =
$\lambda f_{<e,t>}.\lambda P_{<s,et>}. \lambda p_{<s,t>}$. ∃x [f(x) = 1 & p = λw'.P(w')(x)]

- There is no problem for single wh-questions for (15), assuming C is semantically vacuous.

- Abbreviation

(21) $\tau q = <<s,t>,t>>$ (question-extensions)

(22) [[**which**]] $<et,<<s,et>, \tau q>>$

[[**which subway line**]] $<<s,et>, \tau q>$

2.2 A problem with multiple-questions

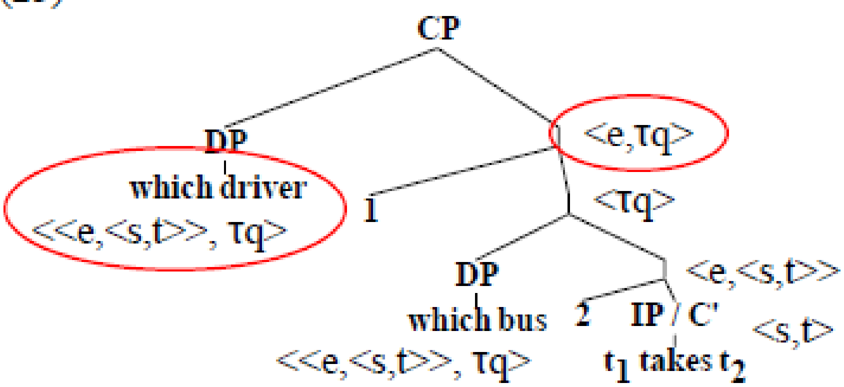
(23) Which driver takes which bus?

- What we want is…

(24) [[**which driver takes which bus**]]w =
$\lambda p_{<s,t>}. \exists x \exists y$ [x is a driver in w & y is a bus in w & p = that x takes y]
= {that x takes y: x ∈{α: α is a driver}, y ∈{β: β is a bus}}

- Type-mismatch!

(25)



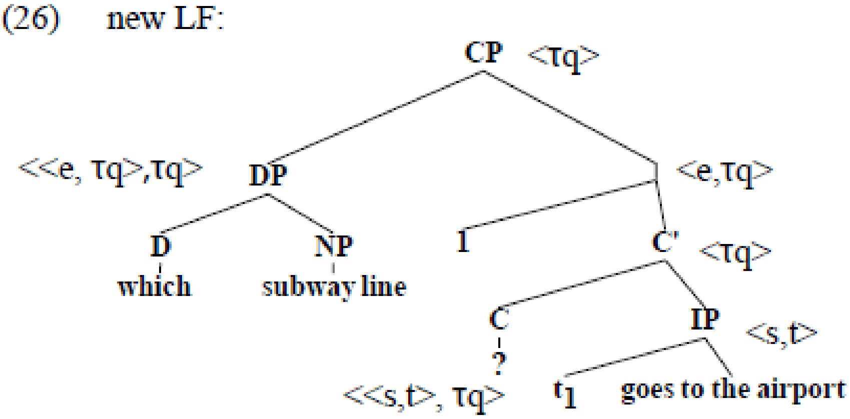
2.3 Karttunen's solution: factoring out the Q-morpheme

- C hosts a semantically non-vacuous morpheme, Q-morpheme "**?**".

(27) [[**?**]] = $\lambda p_{<s,t>}. \lambda q_{<s,t>}.$ q = p (type: <<s,t>, τq>)
= λp. {q: q = p} = λp. {p}

- The Q-morpheme takes a proposition and returns the singleton set of the proposition (proto-question).

(26) new LF:



(28) [[**which**]] =
$\lambda f_{<e,t>}.\ \lambda P_{<e,\tau q>}.\ \lambda p_{<s,t>}.\ \exists x\,[f(x) = 1\ \&\ P(x)(p) = 1]$.
(in set talk: $\lambda f.\ \lambda P.\ \lambda p.\ \exists x\,[f(x) = 1\ \&\ p \in P(x)]$) (type: <<e,t>,<<e,τq>>,τq>>)

- Calculation

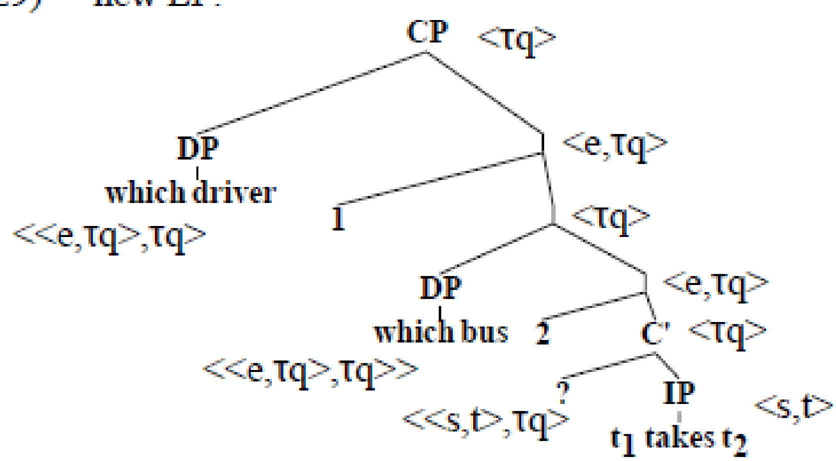
[[(26)]]$_w$ =
[[**which**]]([[**subway line**]]$_w$)([[**1. ?. t1 goes to the airport**]]$_w$) =
$\lambda p.\exists x$ [[[**subway line**]]$_w$(x) = 1 & [[**1. ?. t1 goes to the airport**]]$_w$(x)(p) = 1] =
$\lambda p.\exists x$ [x is a subway line in w & [[**?. t1 goes to the airport**]]$_{w,[1\rightarrow x]}$ (p) = 1] =
$\lambda p.\exists x$ [x is a sw-line in w & [[**?**]]([[**t1 goes to the airport**]]$_{¢[1\rightarrow x]}$)(p) = 1] =
$\lambda p.\exists x$ [x is a sw-line in w & p = [[**t1 goes to the airport**]]$_{¢[1\rightarrow x]}$]

[[**t1 goes to the airport**]]$_{¢[1□x]}$ =
$\lambda w'$. x goes to the airport in w'

Therefore, [[(26)]]$_w$ =
$\lambda p.\exists x$ [x is a subway line in w & p = $\lambda w'$. x goes to the airport in w']

- Multiple-question

(29) new LF:



2.4 Interpretability and the LF-distribution of wh-phrases

- Wh-phrases are like generalized quantifiers.

Wh-phrases = Interrogative generalized quantifiers (IGQ) = <<e,τq>,τq>
Ordinary generalized quantifiers (OGQ) = <<e,t>, t>

- IGQs and OGQs are in complementary distribution at LF
-*IGQs*: must move to spec "?" , cannot be interpreted *in-situ*
-*OGQs*: must *not* move to spec "?" , interpreted *in-situ*