Bare Interrogatives and Number: a Case for Higher Order Quantification, a Weak Singular and a Strong Plural.

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Introduction

Complex vs. mono-morphemic ('bare') interrogatives

(1) Which student left?

(2) Which student**s** left?

(3) Who left?

Beyond English: number inflected bare interrogatives.

(4) Who left?

(5) ¿Quién marchó?
who.SG left.SG

(6) ¿Quién**es** marcharon ?
who.PL left.PL

(For Spanish, see Maldonado 2020, for Hungarian, Elliott et al. 2020)

Plurals that look like plurals: antiuniqueness.

(7) ¿Quién**es** marcharon ?
who.PL left.PL

(8) a. # Juan.
b. ✓Juan y María.

Singulars that don’t look like singulars: no uniqueness.

(9) ¿Quién marchó?
who.SG left.SG

(10) a. ✓Juan.
b. ✓ Juan y María.

Maldonado 2020

Number-inflected bare interrogatives pose a challenge to the theory of number in wh-interrogatives presented in Dayal 1996.

Dayal 1996: strong singular, weak plural.

Singular interrogatives range over atomic individuals (are 'strong')

→ answers to singular questions presuppose that at most one singular answer is true ('uniqueness')

Plural interrogatives range over atomic and non-atomic individuals (are 'weak')

→ plural questions allow for singular and plural semantic answers.

→ antiuniqueness for plural questions ← pragmatic competition with singular questions.

Challenges

Singular bare interrogatives don’t convey uniqueness.

The antiuniqueness of plural bare interrogatives cannot derive from a competition with their singular counterparts, since those don’t convey uniqueness.

Maldonado 2020: weak singular, strong plural.

Singular bare interrogatives are weak:

they range over atomic and non-atomic individuals.

→ singular bare questions have $\left\{\begin{array}{c}\text{singular}\\ \text{and}\\ \text{plural}\end{array}\right\}$ semantic answers.

Plural bare interrogatives are strong:

they range over non-atomic individuals only.

→ plural bare questions only have plural semantic answers.

Today

1. The weak singular / strong plural theory inherits from Dayal's the overgeneration of uniqueness inferences.

Today

2. To solve the problem that bare interrogatives forms pose for Dayal's theory, we propose, in line with Elliott et al. 2020, that bare interrogatives range over generalized quantifiers.

(in particular: conjunctions and disjunctions)

Today

3. Unlike Elliott et al.'s proposal, we still side with Maldonado.
   We assume:

   that the plural form is strong

   (it ranges over generalized conjunctions and disjunctions formed out of non-atomic individuals),

   that the singular is weak

   (it ranges over conjunctions and disjunctions of both atomic and non-atomic individuals).

Roadmap

2. Background: Why are bare interrogatives a puzzle for Dayal (1996)?

3. A solution: Weak singular, strong plural, higher-order quantification.

4. An alternative and its challenges.

5. Conclusions.

Background: Why are bare interrogatives a puzzle for Dayal (1996)?

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Number and *wh*-interrogatives: Dayal 1996.

Dayal's paradigm: answerhood conditions and number.

Singular complex *wh*- questions . . .

allow for singular answers:

(11) a. Which student left?
b. ✓ Al [left].

exclude plural answers:

(12) a. Which student left?
b. # Al and Bob [left].

Dayal's paradigm: answerhood conditions and number.

Plural complex *wh-* questions . . .

allow for plural answers:

(13) a. Which student**s** left?
b. ✓ Al and Bob [left].

exclude singular answers:

(14) a. Which student**s** left?
b. # Al [left].

Dayal's paradigm: answerhood conditions and number.

Bare *wh*-questions . . .

allow for singular answers:

(15) a. Who left?
b. ✓ Al [left].

and also for plural answers:

(16) a. Who left?
b. ✓ Al and Bob [left].

Background: Why are bare interrogatives a puzzle for Dayal (1996)?

Deriving Dayal's paradigm

Deriving uniqueness for singular forms: assumptions.

1. Strong singular.
2. *Wh-s* range over individuals.
3. Maximally informative answer.

Strong singular.

The extension of roots and plural NPs is closed under sum formation:

(17) $[\![\sqrt{\text{student}}]\!]^w = \lambda x.\ {}^*\mathbf{student}_w(x)$

(18) $[\![\text{student.PL}]\!]^w = [\![\sqrt{\text{student}}]\!]^w(x) = \lambda x.\ {}^*\mathbf{student}_w(x)$

The extension of singular NPs ranges over atomic individuals only:

(19) $[\![\text{student.SG}]\!]^w = \lambda x : \mathbf{atom}(x).\ [\![\sqrt{\text{student}}]\!]^w(x)$
$= \lambda x : \mathbf{atom}(x).\ {}^*\mathbf{student}_w(x)$

Deriving uniqueness for singular forms: assumptions.

1. Strong singular.
2. *Wh-s* range over individuals.
3. Maximally informative answer.

Wh-s range over individuals.

(20) $[\![\text{which}]\!] = \lambda P_{et} \lambda Q_{et}.\ \exists x_{e} [P(x) \wedge Q(x)]$

Deriving uniqueness for singular forms.

1. Strong singular.
2. *Wh-s* range over individuals.
3. Maximally informative answer.

Maximally informative answer.

Questions denote in *w* a set of propositions corresponding to their possible answers.

(Hamblin, 1973).

Maximally informative answer

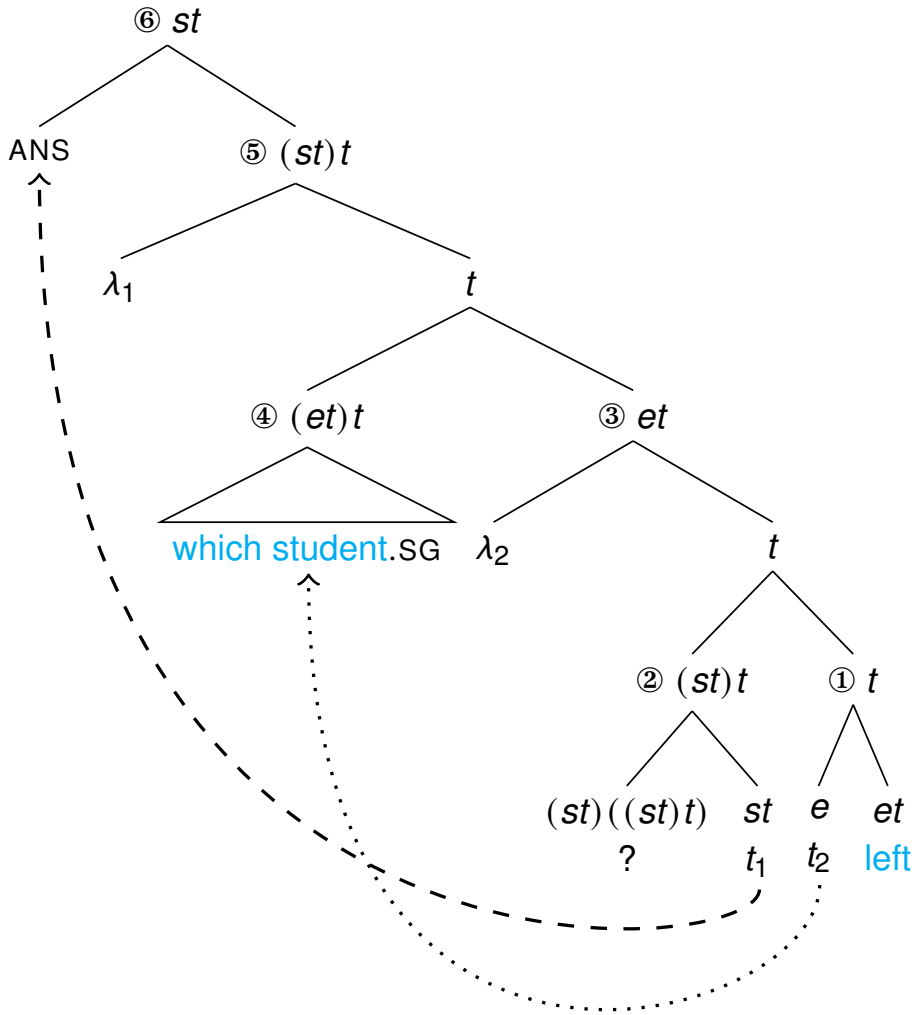
$[[②]]^{w,g} = \{\lambda v.{}^{*}\mathbf{left}_v(\mathbf{x})\}$

$[[⑤]]^{w,g} =$
$\{\lambda v.\ {}^{*}\mathbf{left}_v(x) \mid [[\text{student.SG}]]^{w}(x)\}$

$\{x \mid [[\text{student.SG}]]^{w}(x)\} = \{\mathbf{a}, \mathbf{b}\}$

$[[⑤]]^{w,g} =$

$$\left\{ \begin{array}{c} \lambda v.{}^{*}\mathbf{left}_v(\mathbf{a}), \\ \lambda v.{}^{*}\mathbf{left}_v(\mathbf{b}) \end{array} \right\} = \left\{ \begin{array}{c} {}^{*}\mathbf{left}(\mathbf{a}), \\ {}^{*}\mathbf{left}(\mathbf{b}) \end{array} \right\}$$



Maximally informative answer.

p_{st} is a maximally informative member of $Q_{(st)t}$ ($p \in \mathrm{MAX}_{\subseteq}(Q)$) iff

$p \in Q$, and

p entails every member of Q.

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☞ Q contains at most one maximally informative member.

Maximally informative answer.

p_{st} is a maximally informative member of $Q_{(st)t}$ ($p \in \mathrm{MAX}_{\subseteq}(Q)$) iff

$p \in Q$, and

p entails every member of Q.

☞ Q contains at most one maximally informative member.

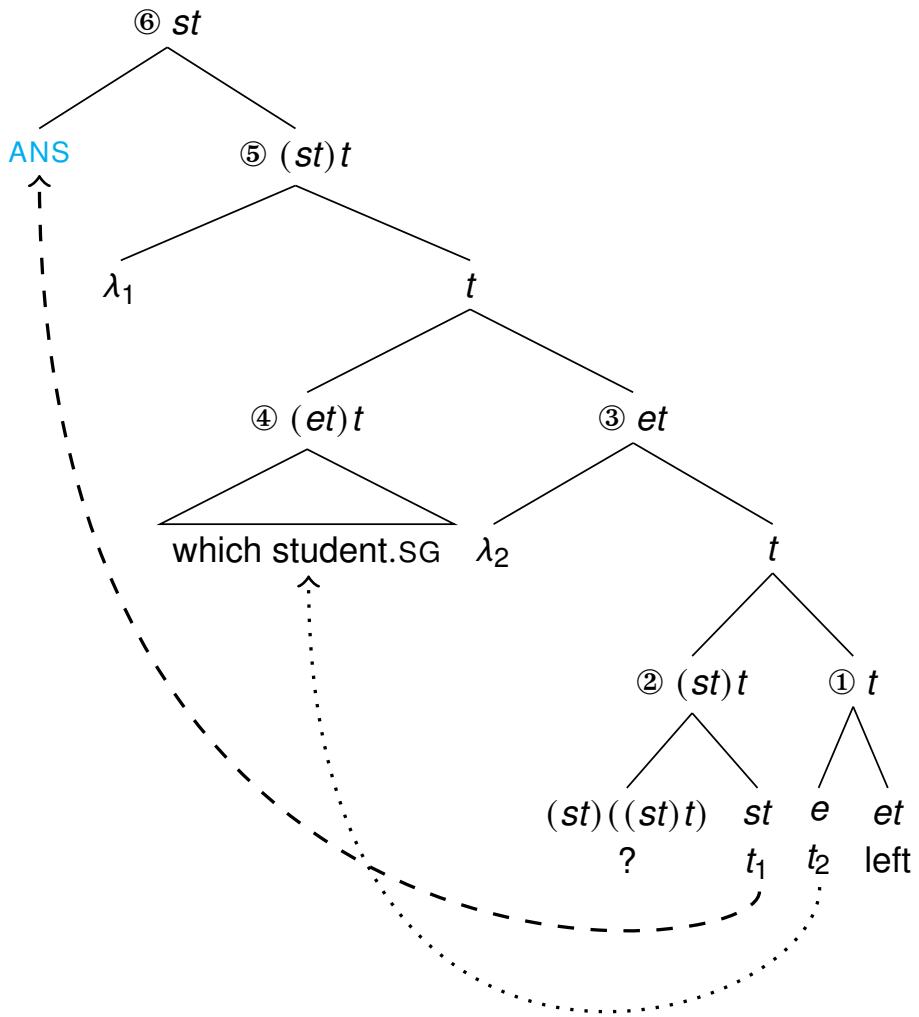
☞ Q has a maximally informative p iff $\bigcap Q \in Q$.

Maximally informative answer.

$[\![\text{ANS}]\!]^w$ requires Q to contain a maximally informative p that is true in w.

When that requirement is met, $[\![\text{ANS}]\!]^w$ picks that p.

$[\![\text{ANS}]\!]^w =$
$\lambda Q_{(st)t}\colon \text{MAX}_{\subseteq}(\{p \mid w \in p \in Q\}) \neq \varnothing.$
$\textbf{the}(\text{MAX}_{\subseteq}(\{p \mid w \in p \in Q\}))$



Deriving uniqueness for singular forms: assumptions.

1. Strong singular.
2. *Wh-s* range over individuals.
3. Maximally informative answer.

Deriving uniqueness.

(21) $[[\lambda_1$ which student.SG $\lambda_2[[?\ t_1][\ t_2$ left$]]]]^w = \left\{ \begin{array}{c} {}^*\textbf{left}(\textbf{a}), \\ {}^*\textbf{left}(\textbf{b}) \end{array} \right\}$

	w_1	w_2	w_3
facts	no student left_w	only **a** left_w	**a** and **b** left_w
$\text{TRUE}_w(Q)$	$\varnothing$	$\{{}^*\textbf{left}(\textbf{a})\}$	$\left\{ \begin{array}{c} {}^*\textbf{left}(\textbf{a}), \\ {}^*\textbf{left}(\textbf{b}) \end{array} \right\}$
$\text{MAX}_{\subseteq}(\text{TRUE}_w(Q))$	x	✓	x

$[[\text{ANS}]]^w$ (21) is defined only if exactly one student left in w.

Deriving antiuniqueness for plural forms: assumptions.

1. Strong singular.
2. *Wh-s* range over individuals.
3. Maximally informative answer.
4. Weak plural.
5. Pragmatic competition between singular and plural.
6. Exhaustification.

Hamblin sets of plural questions closed under conjunction.

(22) $[[\lambda_1[\text{ which student.SG }]\ \lambda_2[[?t_1][\ t_2\ \text{ left}]]]]^w$

$$= \left\{ \begin{array}{c} {}^*\mathbf{left}(\mathbf{a}), \\ {}^*\mathbf{left}(\mathbf{b}) \end{array} \right\}$$

(23) $[[\lambda_1\ [\text{ which student.PL }]\ \lambda_2\ [\ ?\ t_1\ ]\ [t_2\ \text{left}]]]^{w,g}$

$$= \left\{ \begin{array}{c} {}^*\mathbf{left}(\mathbf{a}), \\ {}^*\mathbf{left}(\mathbf{b}), \\ {}^*\mathbf{left}(\mathbf{a} \oplus \mathbf{b}) \end{array} \right\} = \left\{ \begin{array}{c} {}^*\mathbf{left}(\mathbf{a}), \\ {}^*\mathbf{left}(\mathbf{b}), \\ {}^*\mathbf{left}(\mathbf{a}) \wedge^* \mathbf{left}(\mathbf{b}) \end{array} \right\}$$

ANS delivers an existential presupposition.

(24) $[[\lambda_1$ [which student.PL] λ_2 [? t_1] [t_2 left]]]^{w,g}

$$= \left\{ \begin{array}{c} {}^*\textbf{left}(\textbf{a}), \\ {}^*\textbf{left}(\textbf{b}), \\ {}^*\textbf{left}(\textbf{a} \oplus \textbf{b}) \end{array} \right\} = \left\{ \begin{array}{c} {}^*\textbf{left}(\textbf{a}), \\ {}^*\textbf{left}(\textbf{b}), \\ {}^*\textbf{left}(\textbf{a}) \wedge {}^*\textbf{left}(\textbf{b}) \end{array} \right\}$$

	w_1	w_2	w_3
facts	no student left$_w$	only **a** left$_w$	**a** and **b** left$_w$
TRUE$_w$(Q)	$\varnothing$	$\{{}^*\textbf{left}(\textbf{a})\}$	$\left\{ \begin{array}{c} {}^*\textbf{left}(\textbf{a}), \\ {}^*\textbf{left}(\textbf{b}), \\ {}^*\textbf{left}(\textbf{a}) \wedge {}^*\textbf{left}(\textbf{b}) \end{array} \right\}$
MAX$_\subseteq$ (TRUE$_w$(Q))	x	✓	✓

[[ANS]]^w (24) is defined iff some student left in w.

ANS delivers an existential presupposition.

(27) $[[\lambda_1\ [\ \text{which student.PL}\ ]\ \lambda_2\ [\ ?\ t_1\ ]\ [t_2\ \text{left}]]]^{w,g}$

$$= \left\{ \begin{array}{c} {}^*\mathbf{left}(\mathbf{a}), \\ {}^*\mathbf{left}(\mathbf{b}), \\ {}^*\mathbf{left}(\mathbf{a} \oplus \mathbf{b}) \end{array} \right\} = \left\{ \begin{array}{c} {}^*\mathbf{left}(\mathbf{a}), \\ {}^*\mathbf{left}(\mathbf{b}), \\ {}^*\mathbf{left}(\mathbf{a}) \wedge {}^*\mathbf{left}(\mathbf{b}) \end{array} \right\}$$

$[[\text{ANS}]]^w$ (27) is defined iff some student left in w.

Plural answers expected.

Singular answers expected too!

Deriving antiuniqueness for plural forms: assumptions.

1. Strong singular.
2. *Wh-s* range over individuals.
3. Maximally informative answer.
4. Weak plural.
5. Pragmatic competition between singular and plural.
6. Exhaustification.

Singular vs. plural competition.

(25) $[\![\text{ANS}\ \lambda_1\ [\ \text{which student.SG}\ ]\ \lambda_2\ [\ ?\ t_1\ ]\ t_2\ \text{left}]\!]^{w,g}$

presupposes that only one student left.

(26) $[\![\text{ANS}\ \lambda_1\ [\ \text{which student.PL}\ ]\ \lambda_2\ [\ ?\ t_1\ ]\ t_2\ \text{left}]\!]^{w,g}$

presupposes that at least one student left.

Both defined and equivalent when only one student left.

Block (26) when both (26) and (25) are defined,
i.e. when only one student left.

Deriving antiuniqueness for plural forms: assumptions.

1. Strong singular.
2. *Wh-s* range over individuals.
3. Maximally informative answer.
4. Weak plural.
5. Pragmatic competition between singular and plural.
6. Exhaustification.

EXH_{p} strengthens presuppositions.

(27) a. $[[\text{ANS}\ \lambda_1\ [\ \text{which student.SG}\ ]\ \lambda_2\ [\ ?\ t_1\ ]\ t_2\ \text{left}]]^w$

b. $[[\text{ANS}\ \lambda_1\ [\ \text{which student.PL}\ ]\ \lambda_2\ [\ ?\ t_1\ ]\ t_2\ \text{left}]]^w$

(28) $[[\text{EXH}_{\text{p}}\ \text{ANS}\ \lambda_1\ [\ \text{which student.PL}\ ]\ \lambda_2\ [\ ?\ t_1\ ]\ t_2\ \text{left}]]^w$

is defined only if (27-b) is and (27-a) is not,

i.e. iff some student left in *w*
and not [only one student left in *w*],

i.e. iff more than one student left in *w*

Background: Why are bare interrogatives a puzzle for Dayal (1996)?

A challenge: number inflected bare interrogatives.

Bare interrogatives uninflected for number.

(29) a. Who left?
b. ✓Al [left].
c. ✓Al and Bob [left].

If *who* is semantically plural (ranges over atomic and non-atomic individuals), ANS will trigger an existential presupposition.

No competition with a singular form expected to strengthen the existential presupposition to an antiuniqueness presupposition.

A challenge (Maldonado, 2020).

(30) a. ¿Quién marchó?
who.SG left.SG

b. ✓Ana.

c. ✓Ana y Blas.

(31) a. ¿Quién**es** marcharon?
who.PL left.PL

b. # Ana.

c. ✓Ana y Blas.

Strong singular?

(32) a. $[[\text{quién}]]^w =$
$\lambda Q_{et}.\ \exists x[{}^*\textbf{human.sg}_w(x) \wedge Q(x)]$
$({}^*\textbf{human.sg}_w(x) := \lambda x : \textbf{atom}(x).\lambda w.{}^*\textbf{human}_w(x))$

b. $[[\text{quiénes}]]^w =$
$\lambda Q_{et}.\ \exists x[{}^*\textbf{human}_w(x) \wedge Q(x)]$

(32-a) wrongly predicts a uniqueness presupposition for answers to *quién* questions.

Weak singular?

(33) $[[\text{quién}]]^w = \lambda Q_{et}.\ \exists x[{}^*\mathbf{human}_w(x) \wedge Q(x)]$

(33) predicts a weaker existential presupposition to *quién* questions.

But if the plural is weak, it would be equivalent to its singular counterpart and no antiuniqueness would be derived.

(34) $[[\text{quiénes}]]^w = \lambda Q_{et}.\ \exists x[{}^*\mathbf{human}_w(x) \wedge Q(x)]$

Number inflected bare interrogatives: Two puzzles.

1. Why do singular bare interrogatives not convey uniqueness?
2. Why do their plural counterparts convey antiuniqueness?

A solution: Weak singular, strong plural, higher-order quantification.

A solution: Weak singular, strong plural, higher-order quantification.

The weak singular / strong plural analysis (Maldonado, 2020)

Maldonado (2020)

1. *Wh-s* range over individuals.
2. Maximally informative answer.
3. ~~Strong singular.~~ $\rightsquigarrow$ Weak singular.
4. ~~Weak plural.~~ $\rightsquigarrow$ Strong plural.
5. Pragmatic competition between singular and plural.
6. ~~Exhaustification~~

Weak singular, strong plural.

(35) a. $[\![\text{quién}_{\text{weak}}]\!]^w =$
$\lambda Q_{et}.\ \exists x[{}^*\textbf{human}_w(x) \wedge Q(x)]$

b. $[\![\text{quién}\textcolor{cyan}{\text{es}}_{\text{strong}}]\!]^w =$
$\lambda Q_{et}.\ \exists x[{}^*\textbf{human.}\textcolor{cyan}{\textbf{pl}}_w(x) \wedge Q(x)]$

$({}^*\textbf{human.}\textcolor{cyan}{\textbf{pl}}_w(x)$
$:= \lambda x : \neg\textcolor{cyan}{\textbf{atom}}(x).\lambda w.{}^*\textbf{human}_w(x))$

Weak singular: no uniqueness.

(36) $[[\lambda_1 \text{ quién}_{\text{weak}} \lambda_2 [\ ?\ t_1\ ]\ t_2 \text{ left}\ ]]^{w,g} =$

$$\left\{ \begin{array}{c} {}^*\textbf{left}(\textbf{a}), \\ {}^*\textbf{left}(\textbf{b}), \\ {}^*\textbf{left}(\textbf{a} \oplus \textbf{b}) \end{array} \right\} = \left\{ \begin{array}{c} {}^*\textbf{left}(\textbf{a}), \\ {}^*\textbf{left}(\textbf{b}), \\ {}^*\textbf{left}(\textbf{a}) \wedge {}^*\textbf{left}(\textbf{b}) \end{array} \right\}$$

	w_1	w_2	w_3
facts	no student left$_w$	only **a** left$_w$	**a** and **b** left$_w$
$\text{TRUE}_w(Q)$	$\varnothing$	$\{{}^*\textbf{left}(\textbf{a})\}$	$\left\{ \begin{array}{c} {}^*\textbf{left}(\textbf{a}), \\ {}^*\textbf{left}(\textbf{b}), \\ {}^*\textbf{left}(\textbf{a}) \wedge {}^* \textbf{left}(\textbf{b}) \end{array} \right\}$
$\text{MAX}_{\subseteq}(\text{TRUE}_w(Q))$	x	✓	✓

$[[\text{ANS}]]^w$ (36) is defined iff some student left in w.

Strong plural: antiuniqueness without strengthening.

(37) $[\![\lambda_1 \text{ quiénes}_{\text{strong}}\ \lambda_2\ [\ ?\ t_1\ ]\ t_2 \text{ left}\ ]\!]^{w,g} = \{^*\textbf{left}(\textbf{a} \oplus \textbf{b})\}$
$= \{^*\textbf{left}(\textbf{a}) \wedge^* \textbf{left}(\textbf{b})\}$

	w_1	w_2	w_3
facts	no student left_w	only **a** left_w	**a** and **b** left_w
$\text{TRUE}_w(Q)$	$\varnothing$	$\varnothing$	$\{^*\textbf{left}(\textbf{a}) \wedge^* \textbf{left}(\textbf{b})\}$
$\text{MAX}_{\subseteq}$	x	x	✓

$[\![\text{ANS}]\!]^w$ (37) is defined iff more than one student left in w.

No obligatory $\textsc{exh}_p$.

Obligatory exhaustification would predict uniqueness for the singular form.

Summary

The strong singular / weak plural analysis avoids deriving unattested uniqueness inferences for singular *quién*.

Coming up next:

The strong singular / weak plural analysis still overgenerates uniqueness inferences, a challenge inherited from Dayal's setup.

A solution: Weak singular, strong plural, higher-order quantification.

Collective predicates: an overgeneration challenge.

Plural *quiénes* + collective predicates.

(38)

a. ¿Quién**es** formaron un círculo?
who.PL formed.PL a circle

b. ¿Quién**es** rodearon el edificio?
who.PL surrounded.PL the building

c. ¿Quién**es** se reúnen en la cafetería?
who.PL RFXV meet.PL in the cafeteria

d. ¿Quién**es** son más numerosos que los profesores?
who.PL are.PL more numerous than the professors

Expected.

(39) ¿Quién**es** formaron un círculo?
who.PL formed.PL a circle

(40) a. #Ana [formó un círculo.]
Ana formed.3SG a circle

b. #El estudiante [formó un círculo.]
the student [formed.3SG a circle.]

(41) a. Ana, Blas y Carlos [formaron un círculo.]
Ana, Blas, and Carlos formed.3PL a circle

b. Los estudiantes [formaron un círculo.]
the students [formed.3PL a circle.]

Expected.

(42) $[\![\text{formed a circle}]\!]^w = \lambda x : \neg\textbf{atom}(x).\ {}^*\textbf{formed-a-circle}_w(x)$

(43) $[\![\ \lambda_1\ \text{quiénes}_{\text{strong}}\ \lambda_2\ [\ ?\ t_1\ ]\ t_2\ \text{formed a circle}]\!]^w =$

$$\left\{\begin{array}{c} {}^*\textbf{formed-a-circle}(\textbf{a} \oplus \textbf{b}), \\ {}^*\textbf{formed-a-circle}(\textbf{a} \oplus \textbf{c}), \\ {}^*\textbf{formed-a-circle}(\textbf{b} \oplus \textbf{c}), \\ {}^*\textbf{formed-a-circle}(\textbf{a} \oplus \textbf{b} \oplus \textbf{c}) \end{array}\right\}$$

Unexpected.

(44) ¿Quién**es** formaron un círculo?
who.PL formed.PL a circle

(45) a. Ana y Blas [formaron un círculo] y Ana y Carlos [formaron un círculo.]
Ana and Blas [formed.3PL a circle] and Ana and Carlos [formed.3PL a circle]

b. Los estudiantes [formaron un círculo] y los profesores
the students [formed.3PL a circle] and the professors

[formaron un círculo.]

[formed.3PL a circle]

Uniqueness expected.

The propositions in (46) are logically independent.

(46) $$\left\{\begin{array}{c} {}^{*}\textbf{formed-a-circle}(\textbf{a} \oplus \textbf{b}), \\ {}^{*}\textbf{formed-a-circle}(\textbf{a} \oplus \textbf{c}), \\ {}^{*}\textbf{formed-a-circle}(\textbf{b} \oplus \textbf{c}), \\ {}^{*}\textbf{formed-a-circle}(\textbf{a} \oplus \textbf{b} \oplus \textbf{c}) \end{array}\right\}$$

Only the singleton subsets of ANS have a maximally informative element.

For the set of true propositions that ANS operates over to satisfy the presupposition of ANS, it will have to be a singleton subset of (46).

(Xiang 2016 makes the same point for plural complex interrogatives.)

A solution: Weak singular, strong plural, higher-order quantification.

Restricting overgeneration: higher order quantification.

Solving the problem: Closure under conjunction.

$$\left\{ \ {}^*\mathbf{f}(\mathbf{a} \oplus \mathbf{b}), {}^*\mathbf{f}(\mathbf{a} \oplus \mathbf{c}), {}^*\mathbf{f}(\mathbf{b} \oplus \mathbf{c}), {}^*\mathbf{f}(\mathbf{a} \oplus \mathbf{b} \oplus \mathbf{c}) \ \right\}$$

$$\Rightarrow$$

$$\left\{ \begin{array}{c} {}^*\mathbf{f}(\mathbf{a} \oplus \mathbf{b}),\ {}^*\mathbf{f}(\mathbf{a} \oplus \mathbf{c}),\ {}^*\mathbf{f}(\mathbf{b} \oplus \mathbf{c}),\ {}^*\mathbf{f}(\mathbf{a} \oplus \mathbf{b} \oplus \mathbf{c}), \\ {}^*\mathbf{f}(\mathbf{a} \oplus \mathbf{b}) \wedge^* \mathbf{f}(\mathbf{a} \oplus \mathbf{c}),\ {}^*\mathbf{f}(\mathbf{a} \oplus \mathbf{b}) \wedge^* \mathbf{f}(\mathbf{b} \oplus \mathbf{c}), {}^*\mathbf{f}(\mathbf{a} \oplus \mathbf{c}) \wedge^* \mathbf{f}(\mathbf{b} \oplus \mathbf{c}), \\ {}^*\mathbf{f}(\mathbf{a} \oplus \mathbf{b}) \wedge^* \mathbf{f}(\mathbf{a} \oplus \mathbf{b} \oplus \mathbf{c}), {}^*\mathbf{f}(\mathbf{a} \oplus \mathbf{c}) \wedge^* \mathbf{f}(\mathbf{a} \oplus \mathbf{b} \oplus \mathbf{c}), {}^*\mathbf{f}(\mathbf{b} \oplus \mathbf{c}) \wedge^* \mathbf{f}(\mathbf{a} \oplus \mathbf{b} \oplus \mathbf{c}), \\ {}^*\mathbf{f}(\mathbf{a} \oplus \mathbf{b}) \wedge^* \mathbf{f}(\mathbf{a} \oplus \mathbf{c}) \wedge^* \mathbf{f}(\mathbf{b} \oplus \mathbf{c}), \\ {}^*\mathbf{f}(\mathbf{a} \oplus \mathbf{b}) \wedge^* \mathbf{f}(\mathbf{a} \oplus \mathbf{c}) \wedge^* \mathbf{f}(\mathbf{a} \oplus \mathbf{b} \oplus \mathbf{c}), \\ {}^*\mathbf{f}(\mathbf{a} \oplus \mathbf{b}) \wedge^* \mathbf{f}(\mathbf{b} \oplus \mathbf{c}) \wedge^* \mathbf{f}(\mathbf{a} \oplus \mathbf{b} \oplus \mathbf{c}), \\ {}^*\mathbf{f}(\mathbf{a} \oplus \mathbf{c}) \wedge^* \mathbf{f}(\mathbf{b} \oplus \mathbf{c}) \wedge^* \mathbf{f}(\mathbf{a} \oplus \mathbf{b} \oplus \mathbf{c}), \\ {}^*\mathbf{f}(\mathbf{a} \oplus \mathbf{b}) \wedge^* \mathbf{f}(\mathbf{a} \oplus \mathbf{c}) \wedge^* \mathbf{f}(\mathbf{b} \oplus \mathbf{c}) \wedge^* \mathbf{f}(\mathbf{a} \oplus \mathbf{b} \oplus \mathbf{c}) \end{array} \right\}$$

No uniqueness predicted

(47) $[\![\lambda_1$ quiénes$_{\text{strong}}$ λ_2 [? t_1] t_2 formed a circle $]\!]^w =$
$\{^*\mathbf{f}(\mathbf{a} \oplus \mathbf{b}), ^*\mathbf{f}(\mathbf{b} \oplus \mathbf{c}), ^*\mathbf{f}(\mathbf{a} \oplus \mathbf{b}) \wedge^* \mathbf{f}(\mathbf{b} \oplus \mathbf{c}), \ldots\}$

	w_1	w_2	w_3
facts	no circle$_w$	$^*\mathbf{f}_w(\mathbf{a} \oplus \mathbf{b})$	$^*\mathbf{f}_w(\mathbf{a} \oplus \mathbf{b}) \wedge^* \mathbf{f}_w(\mathbf{b} \oplus \mathbf{c})$
TRUE$_w$(Q)	$\varnothing$	$\{^*\mathbf{f}(\mathbf{a} \oplus \mathbf{b})\}$	$\left\{ \begin{array}{c} ^*\mathbf{f}(\mathbf{a} \oplus \mathbf{b}), \\ ^*\mathbf{f}(\mathbf{b} \oplus \mathbf{c}), \\ ^*\mathbf{f}(\mathbf{a} \oplus \mathbf{b}) \wedge^* \mathbf{f}(\mathbf{b} \oplus \mathbf{c}) \end{array} \right\}$
MAX$_\subseteq$	x	✓	✓

$[\![\text{ANS}]\!]^w$ (47) is defined iff at least one group formed a circle in w.

Getting there: Quantifying over conjunctions.

(48) $\mathbf{Q}^{\wedge}(Q) = \{\lambda P_{et}.\ \forall x \in X[P(x)] \mid X \neq \varnothing \wedge X \subseteq Q\}$,
for any Q_{et}

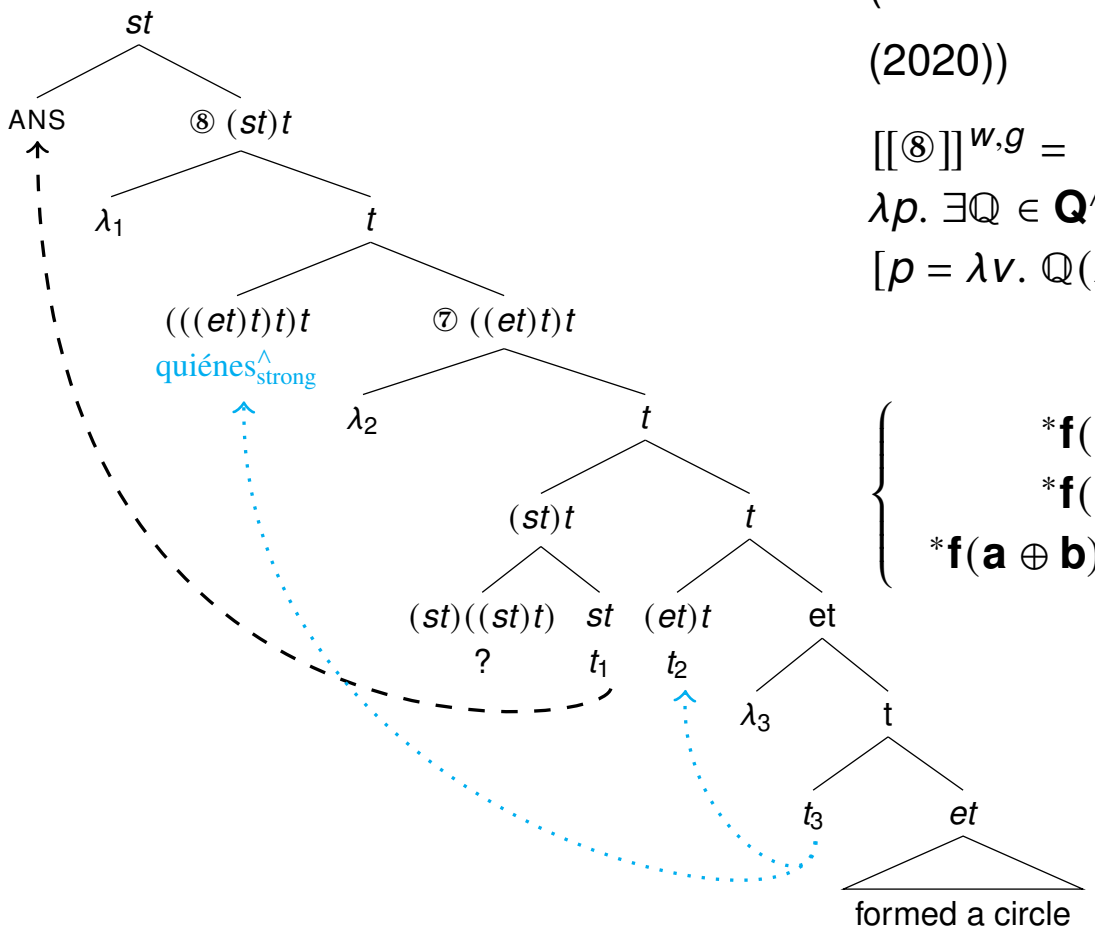
Quién is weak: it quantifies over conjunctions 'formed out' of atomic and non-atomic individuals.

(49) $[[\text{quién}^{\wedge}_{\text{weak}}]]^{w} =$
$\lambda \mathbb{P}_{((et)t)t}.\ \exists \mathbb{Q}_{(et)t} \in \mathbf{Q}^{\wedge}(\{x :^{*}\mathbf{human}_{w}(x)\})[\mathbb{P}(\mathbb{Q})]$

Quiénes is strong: it quantifies over conjunctions 'formed out' of non-atomic individuals.

(50) $[[\text{quiénes}^{\wedge}_{\text{strong}}]]^{w} =$
$\lambda \mathbb{P}_{((et)t)t}.\ \exists \mathbb{Q}_{(et)t} \in \mathbf{Q}^{\wedge}(\{x :^{*}\mathbf{human.pl}_{w}(x)\})[\mathbb{P}(\mathbb{Q})]$

Getting there: Quantifying over conjunctions.



(Movement of $t_{(et)t}$, as in Elliott et al. (2020))

$[[⑧]]^{w,g} =$
$\lambda p.\ \exists \mathbb{Q} \in \mathbf{Q}^{\wedge}(\{x :^{*}\mathbf{human.pl}_{w}(x)\})$
$[p = \lambda v.\ \mathbb{Q}(\lambda x : \neg\mathbf{atom}(x).\ ^{*}\mathbf{f}_{v}(x))]$

$$\left\{ \begin{array}{c} ^{*}\mathbf{f}(\mathbf{a} \oplus \mathbf{b}), \ldots \\ ^{*}\mathbf{f}(\mathbf{b} \oplus \mathbf{c}), \ldots \\ ^{*}\mathbf{f}(\mathbf{a} \oplus \mathbf{b}) \wedge^{*} \mathbf{f}(\mathbf{b} \oplus \mathbf{c}), \ldots \end{array} \right\}$$

Still same Hamblin sets for distributive predicates.

$$[[\lambda_1 \text{ quién}_{\text{weak}} \lambda_2 \text{ [? } t_1 \text{] } t_2 \text{ left }]]^{w,g} = \left\{ \begin{array}{c} {}^*\mathbf{I}(\mathbf{a}), {}^*\mathbf{I}(\mathbf{b}), {}^*\mathbf{I}(\mathbf{c}), \\ {}^*\mathbf{I}(\mathbf{a} \oplus \mathbf{b}), {}^*\mathbf{I}(\mathbf{a} \oplus \mathbf{c}), {}^*\mathbf{I}(\mathbf{b} \oplus \mathbf{c}), \\ {}^*\mathbf{I}(\mathbf{a} \oplus \mathbf{b} \oplus \mathbf{c}) \end{array} \right\}$$

$$= \left\{ \begin{array}{c} {}^*\mathbf{I}(\mathbf{a}), {}^*\mathbf{I}(\mathbf{b}), {}^*\mathbf{I}(\mathbf{c}), \\ {}^*\mathbf{I}(\mathbf{a}) \wedge^* \mathbf{I}(\mathbf{b}), {}^*\mathbf{I}(\mathbf{a}) \wedge^* \mathbf{I}(\mathbf{c}), {}^*\mathbf{I}(\mathbf{b}) \wedge^* \mathbf{I}(\mathbf{c}), \\ {}^*\mathbf{I}(\mathbf{a}) \wedge^* \mathbf{I}(\mathbf{b}) \wedge^* \mathbf{I}(\mathbf{c}) \end{array} \right\}$$

For distributive predicates, the Hamblin sets were already closed under conjunction.

Same sets whether we quantify over individuals or conjunctions ‘formed out’ of atomic individuals and groups.

Still same Hamblin sets for distributive predicates.

$$[[\lambda_1 \text{ quiénes}_{\text{strong}} \lambda_2 \text{ [? } t_1 \text{] } t_2 \text{ left }]]^{w,g} = \left\{ \begin{array}{c} {}^*\mathbf{I}(\mathbf{a} \oplus \mathbf{b}), {}^*\mathbf{I}(\mathbf{a} \oplus \mathbf{c}), {}^*\mathbf{I}(\mathbf{b} \oplus \mathbf{c}), \\ {}^*\mathbf{I}(\mathbf{a} \oplus \mathbf{b} \oplus \mathbf{c}) \end{array} \right\}$$

$$= \left\{ \begin{array}{c} {}^*\mathbf{I}(\mathbf{a}) \wedge^* \mathbf{I}(\mathbf{b}), {}^*\mathbf{I}(\mathbf{a}) \wedge^* \mathbf{I}(\mathbf{c}), {}^*\mathbf{I}(\mathbf{b}) \wedge^* \mathbf{I}(\mathbf{c}), \\ {}^*\mathbf{I}(\mathbf{a}) \wedge^* \mathbf{I}(\mathbf{b}) \wedge^* \mathbf{I}(\mathbf{c}) \end{array} \right\}$$

For distributive predicates, the Hamblin sets were already closed under conjunction.

Same sets whether we quantify over individuals or conjunctions ‘formed out’ of groups.

A solution: Weak singular, strong plural, higher-order quantification.

Disjunctions.

More evidence for higher-order: Spector 2007b, 2008

Complete disjunctive answers conveying free choice.

(51) ¿Con quién**es** tienes que hablar?
with whom.PL have-to.2SG que speak?
With who do you have to speak?

(52) Con Al y Bob o con Al y Charles.
with Al and Bob or with Al and Charles
$\rightsquigarrow \Diamond S(a \oplus b) \wedge \Diamond S(a \oplus c)$

More evidence for higher-order: Spector 2007b, 2008

Complete disjunctive answers conveying free choice.

(53) ¿Con quién tienes que hablar?
with whom.SG have-to.2SG que speak?
With who do you have to speak?

(54) Con Al o con Bob
with Al or with Bob

$\rightsquigarrow \Diamond S(a) \wedge \Diamond S(b)$

(55) Con Al o con Bob y Charles
with Al or with Bob and Charles

$\rightsquigarrow \Diamond S(a) \wedge \Diamond S(b \oplus c)$

Quantification over conjunctions and disjunctions

(56) a. $[\![\text{quién}^{\wedge\vee}_{\text{weak}}]\!]^w =$

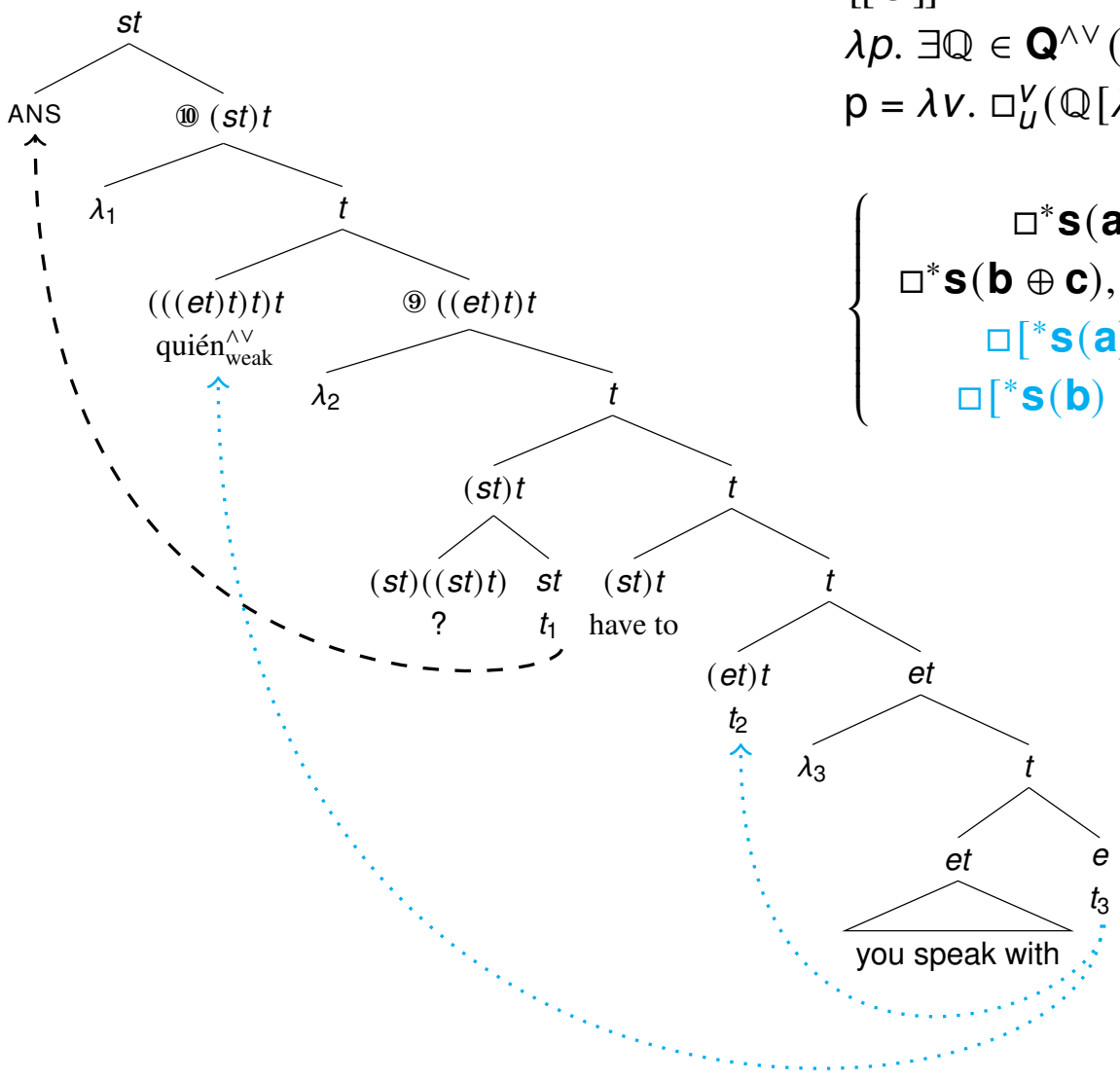
$\lambda\mathbb{P}_{((et)t)t}.\ \exists\mathbb{Q} \in \mathbf{Q}^{\wedge\vee}\ (\{x :^{*}\mathbf{human}_w(x)\})[\mathbb{P}(\mathbb{Q})]$

b. $[\![\text{quién}\textcolor{cyan}{\text{es}}^{\wedge\vee}_{\text{strong}}]\!]^w =$

$\lambda\mathbb{P}_{((et)t)t}.\ \exists\mathbb{Q} \in \mathbf{Q}^{\wedge\vee}(\{x :^{*}\mathbf{human.}\textcolor{cyan}{\mathbf{pl}}_w(x)\})[\mathbb{P}(\mathbb{Q})]$

c. $\mathbf{Q}^{\wedge\vee}(Q) = \begin{array}{c} \{\lambda P_{et}.\ \forall x \in X[P(x)] \mid X \neq \varnothing \wedge X \subseteq Q\} \\ \cup \\ \{\lambda P_{et}.\ \exists x \in X[P(x)] \mid X \neq \varnothing \wedge X \subseteq Q\} \end{array}$

Disjunctions under modals.



$[\![⑩]\!]^{w,g} =$
$\lambda p.\ \exists \mathbb{Q} \in \mathbf{Q}^{\wedge\vee}(\{x :^* \mathbf{human}_w(x)\})$
$\mathrm{p} = \lambda v.\ \Box^v_u(\mathbb{Q}[\lambda x.\ ^*\mathbf{you\text{-}speak\text{-}with}_u(x))]$

$$\left\{ \begin{array}{c} \Box^*\mathbf{s}(\mathbf{a}),\ \Box^*\mathbf{s}(\mathbf{b}),\ \ldots \\ \Box^*\mathbf{s}(\mathbf{b}\oplus\mathbf{c}),\ \Box^*\mathbf{s}(\mathbf{a}\oplus\mathbf{b}\oplus\mathbf{c}),\ \ldots \\ \Box[^*\mathbf{s}(\mathbf{a}) \vee\ ^*\mathbf{s}(\mathbf{b}\oplus\mathbf{c})], \\ \Box[^*\mathbf{s}(\mathbf{b}) \vee\ ^*\mathbf{s}(\mathbf{b}\oplus\mathbf{c})],\ \ldots \end{array} \right\}$$

A solution: Weak singular, strong plural, higher-order quantification.

Interim summary.

Bare interrogatives: Maldonado (2020).

1. Bare *wh-s* range over individuals.
2. Maximally informative answer.
3. ~~Strong singular.~~ $\rightsquigarrow$ Weak singular.
4. ~~Weak plural.~~ $\rightsquigarrow$ Strong plural.
5. Pragmatic competition between singular and plural.
6. ~~Exhaustification~~

Bare interrogatives: us.

1. Bare *wh-s* range over ~~individuals~~ $\rightsquigarrow$ conjunctions and disjunctions.
2. Maximally informative answer.
3. ~~Strong singular.~~ $\rightsquigarrow$ Weak singular.
4. ~~Weak plural.~~ $\rightsquigarrow$ Strong plural.
5. (Pragmatic competition between singular and plural.)
6. ~~Exhaustification~~

Weak plurals elsewhere.

(57) I didn't see any cardinals.

False if the speaker saw one cardinal.

If plural were strong, (57) would convey that the speaker didn't see any group of cardinals.

(Sauerland, 2003; Spector, 2007a; Zweig, 2009) a.o.

Coming up next.

What is the cost of defending a more conservative account that resorts to higher-order quantification but maintains strong singulars and weak plurals?

An alternative and its challenges.

Bare interrogatives: us

1. Bare *wh-s* range over ~~individuals~~ $\rightsquigarrow$ conjunctions and disjunctions.
2. Maximally informative answer.
3. ~~Strong singular.~~ $\rightsquigarrow$ Weak singular.
4. ~~Weak plural.~~ $\rightsquigarrow$ Strong plural.
5. (Pragmatic competition between singular and plural.)
6. ~~Exhaustification~~

Bare interrogatives: Elliott et al. (2020)

1. Bare *wh-s* always range over ~~individuals~~ $\rightsquigarrow$ sometimes over individuals, sometimes conjunctions and disjunctions (and other GQs).
2. Maximally informative answer.
3. Strong singular.
4. Weak plural.
5. Pragmatic competition between singular and plural.
6. Exhaustification (amended)

Coming up next

- Laying out the components of Elliott et al. 2020
- Undergeneration challenges.
- Overgeneration challenges

(Both challenges avoided under the Weak Singular / Strong Plural proposal that we presented)

An alternative and its challenges.

(Elliott et al., 2020)

Bare interrogatives: Elliott et al. (2020)

1. Bare *wh-s* ~~always~~ range over ~~individuals~~ $\rightsquigarrow$
   sometimes over individuals, sometimes over conjunctions and disjunctions (and other GQs).
2. Maximally informative answer.
3. Strong singular.
4. Weak plural.
5. Pragmatic competition between singular and plural.
6. Exhaustification (amended)

Strong singular, weak plural

(58) a. $[\![\text{SG}]\!]^w = \lambda x : \textbf{atom}(x).\ x$

b. $[\![\text{PL}]\!]^w = \lambda x.x$

Bare interrogatives: Elliott et al. (2020).

1. Bare *wh-s* ~~always~~ range over ~~individuals~~ $\rightsquigarrow$
   sometimes over individuals, sometimes over conjunctions and disjunctions (and other GQs)
2. Maximally informative answer.
3. Strong singular.
4. Weak plural.
5. Pragmatic competition between singular and plural.
6. Exhaustification (amended)

Strong *quién* needed.

If *quiénes* is weak, and

antiuniqueness is to be derived via a pragmatic competition,

quiénes must compete with a strong *quién* conveying uniqueness.

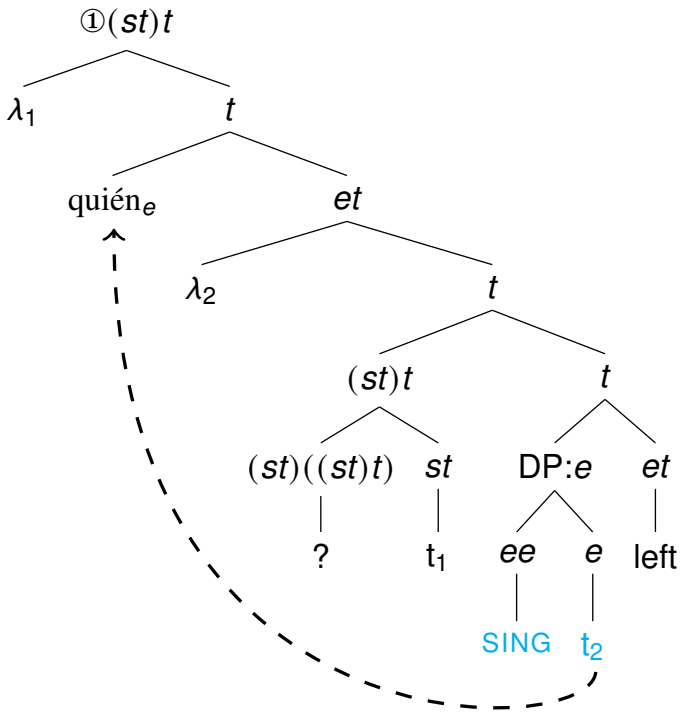
Quantification over individuals or GQs.

quién is ambiguous:

- *quién*$_e$:
  - ranges over atomic individuals,
  - conveys uniqueness
- *quién*$_{(et)t}$:
  - ranges over generalized quantifiers,
  - conveys existence

Both the number associated with *quién*$_e$ and with *quién*$_{(et)t}$ is a strong singular.

quién$_e$, strong singular.



$[\![\text{quién}_e]\!]^w =$

$\lambda P_{et}.\exists x[{}^*\mathbf{human}_w(x) \wedge P(x)]$

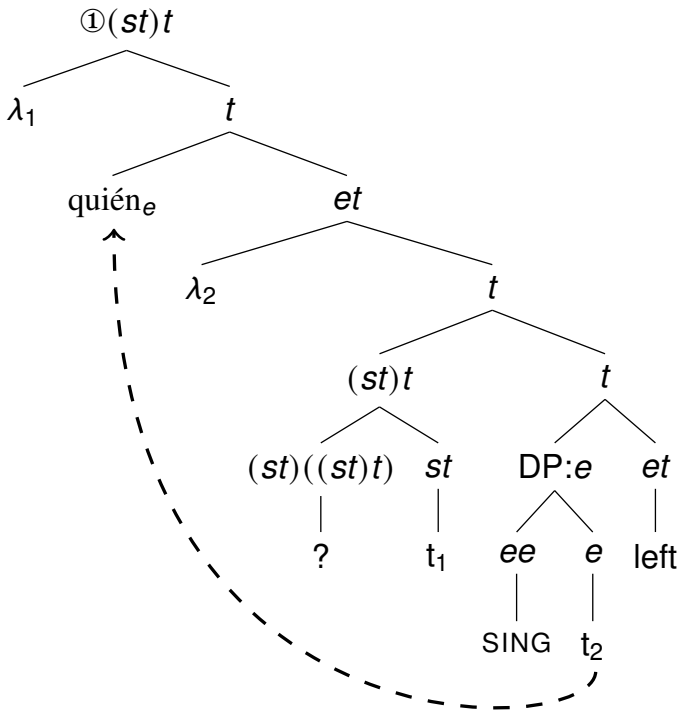
$[[①]]^{w,g} =$

$\lambda p.\ \exists x[{}^*\mathbf{human}_w(x) \wedge$

$\mathrm{p} = \lambda v : \mathbf{atom}(x).{}^*\mathbf{left}_v(x)]$

$$\left\{ \begin{array}{c} \lambda w : \mathbf{atom}(\mathbf{a}).{}^*\mathbf{left}_w(\mathbf{a}), \\ \lambda w : \mathbf{atom}(\mathbf{b}).{}^*\mathbf{left}_w(\mathbf{b}), \\ \lambda w : \mathbf{atom}(\mathbf{a} \oplus \mathbf{b}).{}^*\mathbf{left}_w(\mathbf{a} \oplus \mathbf{b}) \end{array} \right\}$$

quién$_e$, strong singular.



$[\![\text{quién}_e]\!]^w =$

$\lambda P_{et}.\exists x[{}^*\mathbf{human}_w(x) \wedge P(x)]$

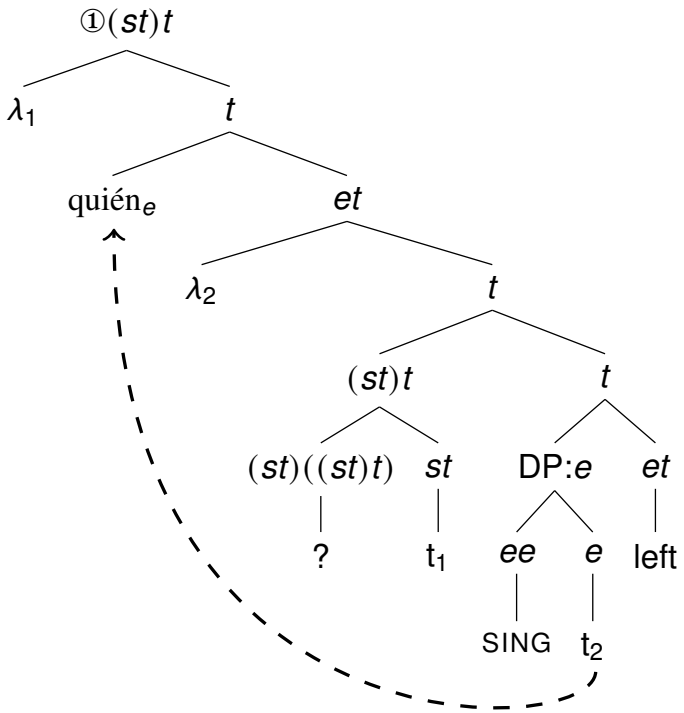
$[[①]]^{w,g} =$

$\lambda p.\ \exists x[{}^*\mathbf{human}_w(x) \wedge$

$\text{p} = \lambda v : \mathbf{atom}(x).{}^*\mathbf{left}_v(x)]$

$$\left\{ \begin{array}{c} {}^*\mathbf{left}(\mathbf{a})_{\mathbf{atom}(\mathbf{a})}, \\ {}^*\mathbf{left}(\mathbf{b})_{\mathbf{atom}(\mathbf{b})}, \\ {}^*\mathbf{left}(\mathbf{a} \oplus \mathbf{b})_{\mathbf{atom}(\mathbf{a} \oplus \mathbf{b})} \end{array} \right\}$$

quién$_e$, strong singular.



$[\![\text{quién}_e]\!]^w =$

$\lambda P_{et}.\exists x[{}^*\mathbf{human}_w(x) \wedge P(x)]$

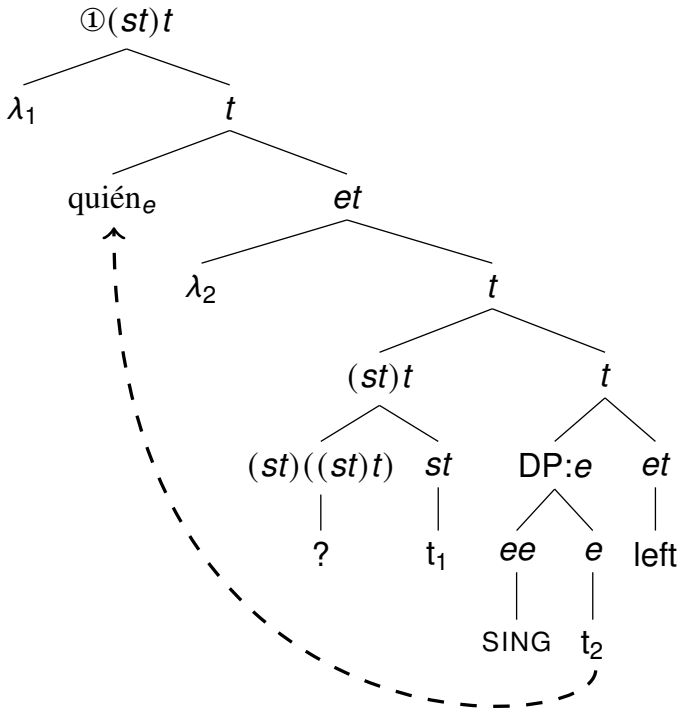
$[[①]]^{w,g} =$

$\lambda p.\ \exists x[{}^*\mathbf{human}_w(x) \wedge$

$\text{p} = \lambda v : \mathbf{atom}(x).{}^*\mathbf{left}_v(x)]$

$$\left\{ \begin{array}{c} {}^*\mathbf{left}(\mathbf{a})_{\mathbf{atom}(\mathbf{a})}, \\ {}^*\mathbf{left}(\mathbf{b})_{\mathbf{atom}(\mathbf{b})} \end{array} \right\}$$

quién$_e$, strong singular



$[\![\text{quién}_e]\!]^w =$

$\lambda P_{et}.\exists x[{}^*\mathbf{human}_w(x) \wedge P(x)]$

$[[①]]^{w,g} =$

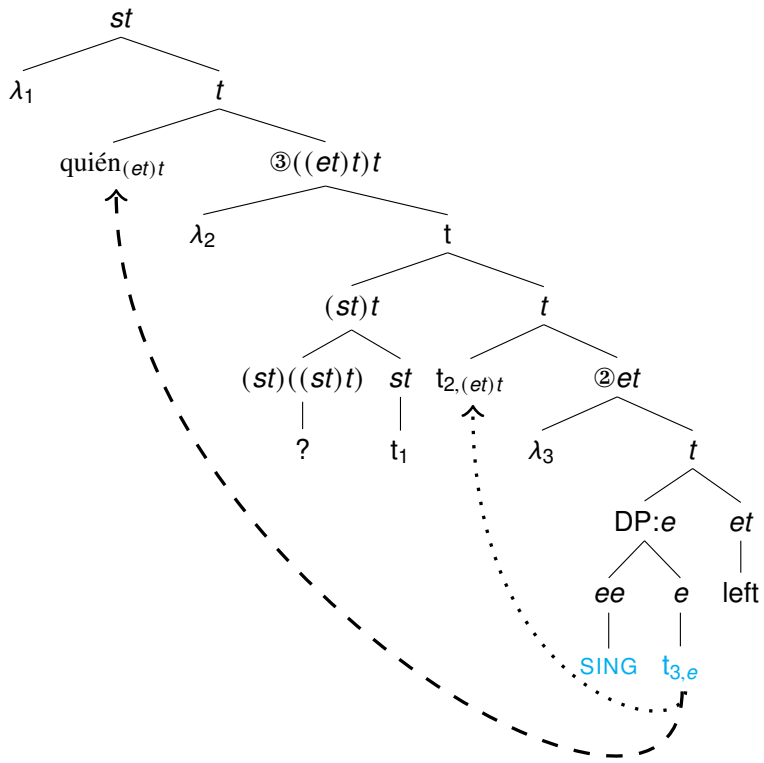
$\lambda p.\ \exists x[{}^*\mathbf{human}_w(x) \wedge$

$\text{p} = \lambda v : \mathbf{atom}(x).{}^*\mathbf{left}_v(x)]$

$$\left\{ \begin{array}{c} {}^*\mathbf{left}(\mathbf{a}), \\ {}^*\mathbf{left}(\mathbf{b}) \end{array} \right\}$$

ANS conveys uniqueness

quién$_{(et)t}$: strong singular.



$[\![②]\!]^w = \lambda x : \mathbf{atom}(x).{}^*\mathbf{left}_w(x)$

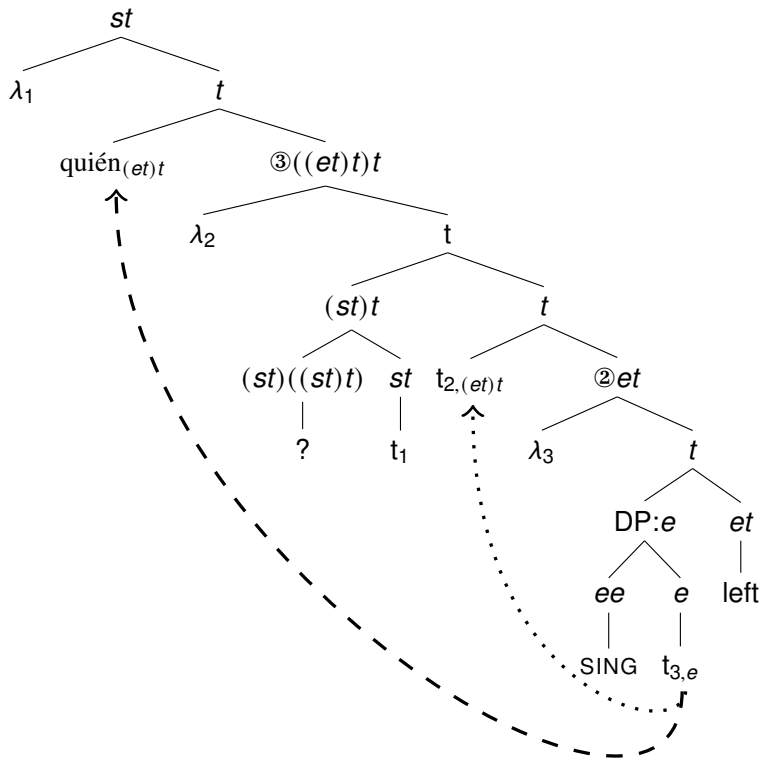
$[[③]]^{w,g} =$
$\lambda\mathbb{Q}_{(et)t}.g(t_1) =$
$\mathbb{Q}(\lambda x : \mathbf{atom}(x).{}^*\mathbf{left}_w(x))$

$[[\textit{quién}_{(et)t}]]^{w,g} =$
$\lambda\mathbb{P}_{((et)t)t}.\exists\mathbb{Q}_{(et)t} \in Q[\mathbb{P}(\mathbb{Q})]$

$Q =$
$\{\lambda P_{et} : \mathbf{atomic}(P).\ \forall x \in X[P(x)] \mid X \neq$
$\varnothing \wedge X \subseteq \{x :{}^* \mathbf{human}_w(x)\}\}$

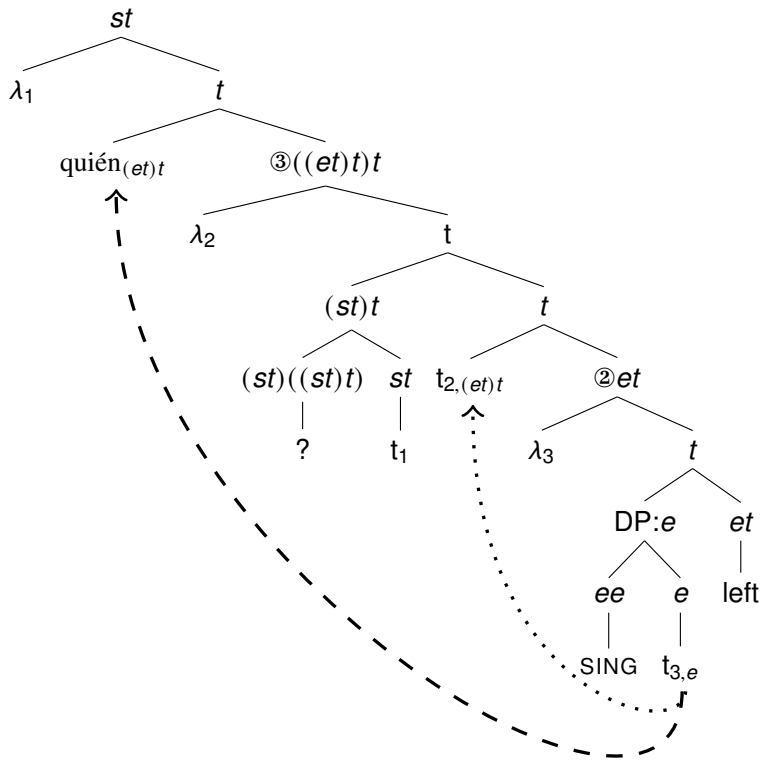
(**atomic**(P) = 1 iff P is only defined for atomic individuals.)

quién$_{(et)t}$: strong singular.



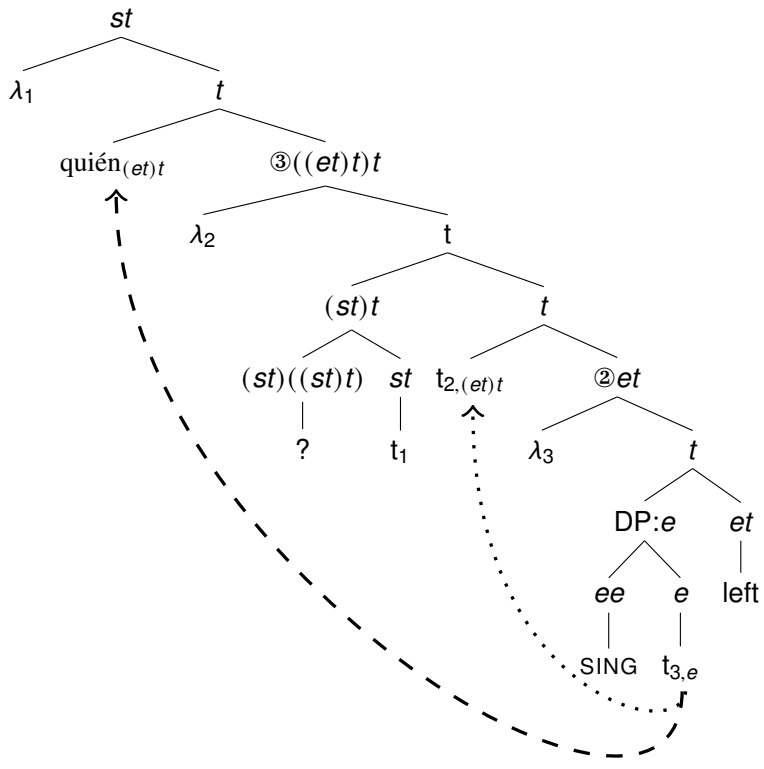
$$\left\{ \begin{array}{c} {}^{*}\mathbf{I}(\mathbf{a})_{\mathbf{at}(\mathbf{a})}, \\ {}^{*}\mathbf{I}(\mathbf{b})_{\mathbf{at}(\mathbf{b})}, \\ {}^{*}\mathbf{I}(\mathbf{a}) \wedge {}^{*}\mathbf{I}(\mathbf{b})_{\mathbf{at}(\mathbf{a}) \wedge \mathbf{at}(\mathbf{b})}, \\ {}^{*}\mathbf{I}(\mathbf{a} \oplus \mathbf{b})_{\mathbf{at}(\mathbf{a} \oplus \mathbf{b})}, \\ {}^{*}\mathbf{I}(\mathbf{a}) \wedge {}^{*}\mathbf{I}(\mathbf{a} \oplus \mathbf{b})_{\mathbf{at}(\mathbf{a}) \wedge \mathbf{at}(\mathbf{a} \oplus \mathbf{b})}, \\ {}^{*}\mathbf{I}(\mathbf{b}) \wedge {}^{*}\mathbf{I}(\mathbf{a} \oplus \mathbf{b})_{\mathbf{at}(\mathbf{b}) \wedge \mathbf{at}(\mathbf{a} \oplus \mathbf{b})} \\ {}^{*}\mathbf{I}(\mathbf{a}) \wedge {}^{*}\mathbf{I}(\mathbf{b}) \wedge {}^{*}\mathbf{I}(\mathbf{a} \oplus \mathbf{b})_{\mathbf{at}(\mathbf{a}) \wedge \mathbf{at}(\mathbf{b}) \wedge \mathbf{at}(\mathbf{a} \oplus \mathbf{b})} \end{array} \right\}$$

quién$_{(et)t}$: strong singular.



$$\left\{ \begin{array}{c} {}^{*}\mathbf{I}(\mathbf{a})_{\mathbf{at}(\mathbf{a})}, \\ {}^{*}\mathbf{I}(\mathbf{b})_{\mathbf{at}(\mathbf{b})}, \\ {}^{*}\mathbf{I}(\mathbf{a}) \wedge {}^{*}\mathbf{I}(\mathbf{b})_{\mathbf{at}(\mathbf{a}) \wedge \mathbf{at}(\mathbf{b})} \end{array} \right\}$$

quién$_{(et)t}$: strong singular.



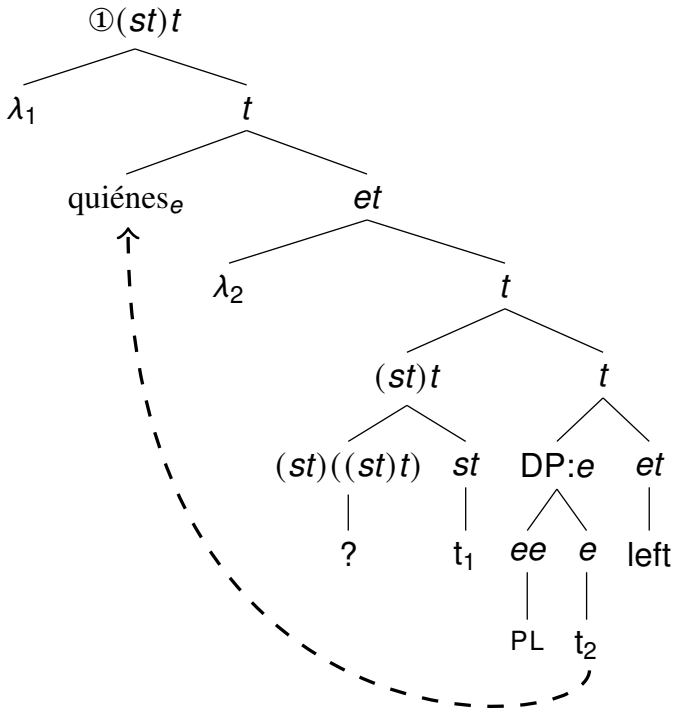
$$\left\{ \begin{array}{c} {}^{*}\mathbf{I}(\mathbf{a}), \\ {}^{*}\mathbf{I}(\mathbf{b}), \\ {}^{*}\mathbf{I}(\mathbf{a} \oplus \mathbf{b}) \end{array} \right\}$$

$$=$$

$$\left\{ \begin{array}{c} {}^{*}\mathbf{I}(\mathbf{a}), \\ {}^{*}\mathbf{I}(\mathbf{b}), \\ {}^{*}\mathbf{I}(\mathbf{a}) \wedge {}^{*}\mathbf{I}(\mathbf{b}), \end{array} \right\}$$

ANS conveys existence

quiénes$_e$



$[\![\text{quiénes}_e]\!]^w =$

$\lambda P_{et}.\exists x[{}^*\mathbf{human}_w(x) \wedge P(x)]$

$[[①]]^{w,g} =$

$\lambda p.\ \exists x[{}^*\mathbf{human}_w(x) \wedge$

$\text{p} = \lambda v.{}^*\mathbf{left}_v(x)]$

$$\left\{ \begin{array}{c} {}^*\mathbf{I}(\mathbf{a}), \\ {}^*\mathbf{I}(\mathbf{b}), \\ {}^*\mathbf{I}(\mathbf{a} \oplus \mathbf{b}), \end{array} \right\}$$

$=$

$$\left\{ \begin{array}{c} {}^*\mathbf{I}(\mathbf{a}), \\ {}^*\mathbf{I}(\mathbf{b}), \\ {}^*\mathbf{I}(\mathbf{a}) \wedge {}^*\mathbf{I}(\mathbf{b}), \end{array} \right\}$$

ANS conveys existence

Bare interrogatives: Elliott et al. (2020).

1. Bare *wh-s* always range over ~~individuals~~ $\rightsquigarrow$
   sometimes over individuals, sometimes over conjunctions and disjunctions (and other GQs).
2. Maximally informative answer.
3. Strong singular.
4. Weak plural.
5. Pragmatic competition between singular and plural.
6. Exhaustification (amended)

Wanted

Obligatory strengthening of *quiénes*$_e$ via competition with *quién*$_e$.

No obligatory strengthening of *quién*$_{(et)t}$ via competition with *quién*$_e$.

Why?

(59) a. ¿Quién marchó?
who.SG left.SG

b. Ana y Blas, o Carlos.
Ana and Blas, or Carlos.

No existence presupposition for *quién*$_{(et)t}$ questions

The domain of *quién*$_{(et)t)}$ includes (60):

(60) $\lambda P_{et} : \mathbf{atomic}(P).\neg\exists x[^{*}\mathbf{human}_{w}(x) \wedge P(x)]$

No existence presupposition for *quién*$_{(et)t)}$ questions: ① can be the maximally informative *p* that is true in *w*.

(61) a. ¿Quién$_{(et)t}$ marchó?
who.SG left.SG

b. $\left\{ \begin{array}{c} {}^{*}\mathbf{I}(\mathbf{a})_{\mathbf{at}(\mathbf{a})}, {}^{*}\mathbf{I}(\mathbf{b})_{\mathbf{at}(\mathbf{b})}, {}^{*}\mathbf{I}(\mathbf{a}) \wedge {}^{*}\mathbf{I}(\mathbf{b})_{\mathbf{at}(\mathbf{a}) \wedge \mathbf{at}(\mathbf{b})}, \\ ① \neg\exists x[^{*}\mathbf{human}_{w}(x) \wedge {}^{*}\mathbf{I}(x)]_{\exists x[^{*}\mathbf{human}_{w}(x) \wedge \mathbf{at}(x)]} \end{array} \right\}$

Three competitors.

	$\text{ANS}(\text{quién}_e)$		$\text{ANS}(\text{quiénes})$		$\text{ANS}(\text{quién}_{(et)t})$
pres.	$\exists!x$	$\Rightarrow$	$\exists x$	$\Rightarrow$	$\varnothing$

☞ One of the competitors of *quiénes* is always defined.

Don't drop EXH_{p} with *quiénes*$_e$.

Avoid Ineffability! (Elliott and Sauerland, 2019; Elliott et al., 2020)

EXH_{p} can be dropped in $[\text{EXH}_{\text{p}}\ \phi]$ in context C iff no alternative to ϕ is defined in C.

EXH_{p} is obligatory for *quiénes* questions. $\rightsquigarrow$ antiuniqueness.

EXH_{p} can be dropped for *quién*$_{(et)t}$ questions when neither uniqueness or existence is taken for granted. $\rightsquigarrow$ no antiuniqueness.

Summary.

Singular is strong.

Plural is weak.

Answers to *quién*$_e$ questions convey uniqueness.

Answers to *quién*$_{(et)t}$ questions don't.

Answers to *quiénes*$_e$ convey antiuniqueness.

An alternative and its challenges.

Challenges.

Challenges.

The Strong Singular assumption faces undergeneration challenges.

The Weak Plural assumption faces overgeneration challenges.

Undergeneration challenges (I): ‘mixed’ predicates.

(62) a. ¿Quién levantó ese piano?
who.SC lifted that piano
‘Who lifted that piano?’

b. Ana y Blas.
Ana and Blas

(62-b) can be felicitous and true in a situation where there was one collective lifting of the piano by Ana and Blas.

Same for Farsi, Greek, Hungarian counterparts.

Undergeneration challenges (I): ‘mixed’ predicates.

(63) a. ¿Quién levantó ese piano?
who.SC lifted that piano
‘Who lifted that piano?’

b. Ana y Blas.
Ana and Blas

Unexpected if *quién* is *quién*$_e$:

answers to *quién*$_e$ questions presuppose that at most one lifting by an atomic individual took place.

Undergeneration challenges (I): 'mixed' predicates

(64) a. ¿Quién levantó ese piano?
who.SC lifted that piano
'Who lifted that piano?'

b. Ana y Blas.
Ana and Blas

Unexpected if *quién* is *quién*$_{(et)t}$:

plural answers to *quién*$_{(et),t}$ questions convey that more than one lifting by an atomic individual took place.

Undergeneration challenges (I): ‘mixed’ predicates.

Possible interpretations for *quién* questions are wrongly ruled out.

Undergeneration challenges (II): cumulative interpretations.

Wh-questions with plural definites and plural wh-phrases allow for cumulative answers.

(Dayal, 1992, 1996; Krifka, 1992)

(65) ¿Qué estudiantes hablaron con esos diez profesores?
which student:pl talked with these ten professors
'Which students talked to these ten professors?'

(66) Esos veinte estudiantes hablaron con esos diez profesores
those twenty students talked with those ten professors

(66) can provide a complete answer, it conveys that

- each of those twenty students talked to at least one of those ten professors, and
- each of those ten professors talked to at least one of those twenty students.

Undergeneration challenges (II): cumulative interpretations.

(67) ¿Qué estudiantes hablaron con esos diez profesores?
which student:pl talked with these ten professors
'Which students talked to these ten professors?'

(68) $[\![\text{ANS}\ (150)]\!]^w =$
$\lambda w.{}^*\textbf{talk}_w(\textbf{those-10-professors})(\textbf{those-twenty-students})$

(69) *Cumulativity, (et)t functions:*
$\forall x, x' \forall y, y' [{}^*\textbf{talk}(x)(y) \wedge {}^*\textbf{talk}(x')(y')] \rightarrow {}^*\textbf{talk}(x \oplus x')(y \oplus y')]$

Undergeneration challenges (II): cumulative interpretations.

Quién questions, and their counterparts in Farsi, Greek and Hungarian, also allow for cumulative answers.

(70) ¿Con quién hablaron esos diez profesores?
with who:SING talked these ten professors
'With whom did these ten professors talk?'

(71) Esos diez profesores hablaron con esos veinte estudiantes.
those ten professors talked with those thirty students

Undergeneration challenges (II): cumulative interpretations

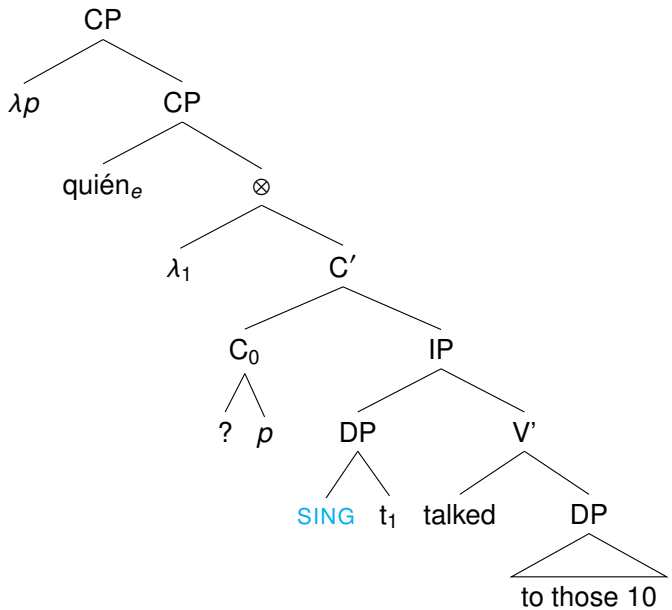
Quién questions, and their counterparts in Farsi, Greek and Hungarian, also allow for cumulative answers.

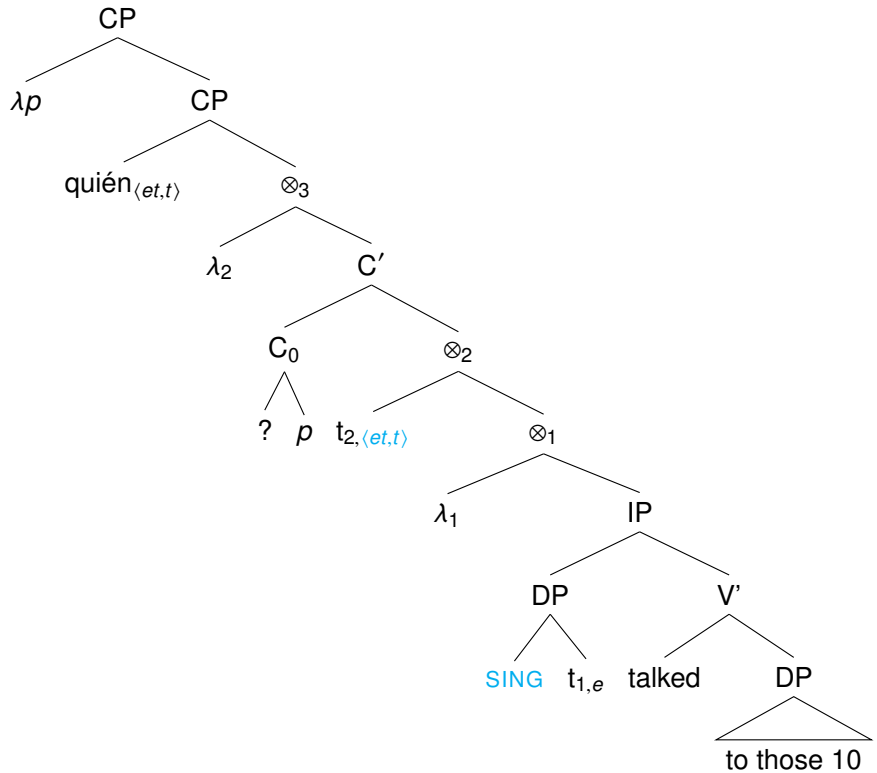
(72) ¿Quién habló con esos diez profesores?
who:SING talked to these ten professors
'Who talked to those ten professors?'

(73) Esos veinte estudiantes hablaron con esos diez profesores.
those twenty students talked to those ten professors

Undergeneration challenges (II): cumulative interpretations.

The existence of cumulative answers for *quién* questions is unexpected, since the base position of both $quién_e$ and $quién_{\langle et,t \rangle}$ is filled by an atomic argument.





Undergeneration challenges (II): cumulative interpretations.

The Hamblin set corresponding to the *quién*$_e$ question will contain propositions of the form in (74). Only those where *x* is an atomic individual will be defined.

(74) $^{*}\mathbf{talk}_{\mathbf{atom(x)}}(x)(\mathbf{those\text{-}10\text{-}students})$

This Hamblin set will yield a uniqueness presupposition conveying that a unique individual talked to those ten professors.

Undergeneration challenges (II): cumulative interpretations.

The Hamblin set corresponding to the *quién*$_{(et)t}$ question expands the Hamblin set of its corresponding *quién*$_e$ question by adding coordinations and disjunctions of propositions of the form in (75).

(75) $^*\mathbf{talk}_{\mathbf{atom}(\mathbf{x})}(x)(\mathbf{those\text{-}10\text{-}students})$

The set will then contain propositions that convey

- that one individual talked to each of those professors,
- that each one of a group of individuals talked to each of those professors, or
- that at least one individual in a group talked to each of those professors.

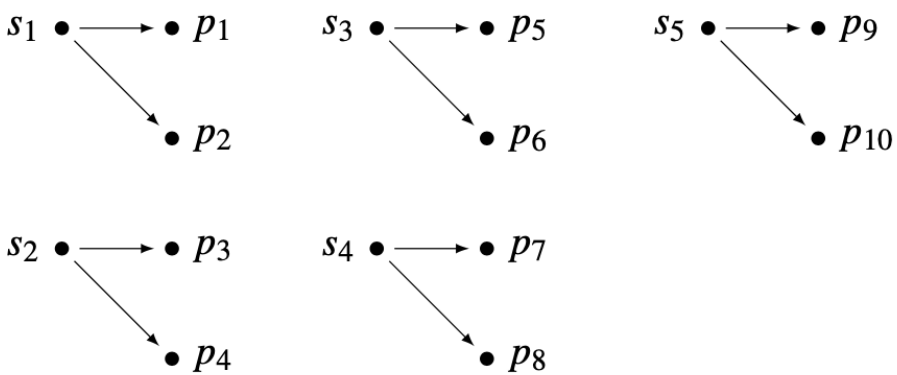
Undergeneration challenges (II): cumulative interpretations.

The set will then contain propositions that convey

- that one individual talked to each of those professors,
- that each one of a group of individuals talked to each of those professors, or
- that at least one individual in a group talked to each of those professors.

No answer predicted to be true in (76):

(76)



Undergeneration challenges (II): cumulative interpretations

Again, attested interpretations are ruled out.

Weak Plural: Overgeneration.

Alonso-Ovalle and Rouillard 2019:

(77) a. A: ¿Con quiénes tiene que hablar Juan?
with who.PL must that speak-to Juan
'With whom does John have to talk?'

b. B: [Juan tiene que hablar] con Ana y Blas o con Carlos y
Juan has to talk with Ana and Blas or with Carlos and
David.
David

Weak Plural: Overgeneration.

Elliott et al. (2020): *quiénes* is also ambiguous:

- *quiénes*$_e$ quantifies over entities
- *quiénes*$_{(et)t}$ ranges over generalized quantifiers.

Weak Plural: Overgeneration.

Assume *quiénes*$_{(et)t}$ ranges over conjunctions, disjunctions, and the negative quantifier.

Since plural is weak, the conjunctions and disjunctions are 'formed out' of atomic and non-atomic individuals.

(78) a. $\{\lambda P_{et}.\ \forall x \in X[P(x)] \mid X \neq \emptyset \wedge X \subseteq \{x :^{*}\mathbf{human}_w(x)\}\}$

b. $\{\lambda P_{et}.\exists x \in X[P(x)] \mid X \neq \emptyset \wedge X \subseteq \{x :^{*}\mathbf{human}_w(x)\}\}$

c. $\{\lambda P_{et}.\neg\exists x[^{*}\mathbf{human}_w(x) \wedge P(x)]\}$

Weak Plural: Overgeneration.

Since plural is weak, the conjunctions and disjunctions are ‘formed out’ of atomic and non-atomic individuals.

The unattested answers below should be in the Hamblin set of *quiénes*$_{(et)t}$.

(79) a. B: # [Juan tiene que hablar] con Ana o con Blas.
[Juan has to talk] with Ana or with Blas.

b. B: # [Juan tiene que hablar] con Ana o con Blas y Carlos.
[Juan has to talk] with Ana or with Blas and Carlos.

They should be ruled out via a pragmatic competition.

Weak Plural: Overgeneration

The unattested answers should be ruled out via a pragmatic competition.

(80) a. B: # [Juan tiene que hablar] con Ana o con Blas.
[Juan has to talk] with Ana or with Blas.

b. B: # [Juan tiene que hablar] con Ana o con Blas y Carlos.
[Juan has to talk] with Ana or with Blas and Carlos.

Competition with *quién*$_e$ will convey that there is no unique individual that Juan is required to talk to.

Not enough:

true if $\Box[^*\mathbf{s(a)} \vee^* \mathbf{s(b)}] \wedge \Diamond^*\mathbf{s(a)} \wedge \Diamond^*\mathbf{s(b)}$

true if $\Box[^*\mathbf{s(a)} \vee^* \mathbf{s(a \oplus b)}] \wedge \Diamond^*\mathbf{s(a)} \wedge \Diamond^*\mathbf{s(a \oplus b)}$

Weak Plural: Overgeneration

The unattested answers should be ruled out via a pragmatic competition.

(81) a. B: # [Juan tiene que hablar] con Ana o con Blas.
[Juan has to talk] with Ana or with Blas.

b. B: # [Juan tiene que hablar] con Ana o con Blas y Carlos.
[Juan has to talk] with Ana or with Blas and Carlos.

Competition with *quiénes*$_e$ will convey that there is no unique group of individuals that Juan is required to talk to.

Still not enough:

true if $\Box[^*\mathbf{s(a)} \vee^* \mathbf{s(b)}] \wedge \Diamond^*\mathbf{s(a)} \wedge \Diamond^*\mathbf{s(b)}$

true if $\Box[^*\mathbf{s(a)} \vee^* \mathbf{s(a \oplus b)}] \wedge \Diamond^*\mathbf{s(a)} \wedge \Diamond^*\mathbf{s(a \oplus b)}$

Weak Plural: Overgeneration

The unattested answers should be ruled out via a pragmatic competition.

(82) a. B: # [Juan tiene que hablar] con Ana o con Blas.
[Juan has to talk] with Ana or with Blas.

b. B: # [Juan tiene que hablar] con Ana o con Blas y Carlos.
[Juan has to talk] with Ana or with Blas and Carlos.

For a *quién*$_{(et)t}$ competitor to rule out answers like these, it would have to presuppose $\neg\Box|\{x :^* \mathbf{s}(x)\}| > 1$

But there are possible maximally informative answers in the *quién*$_{(et)t}$ that convey $\Box|\{x :^* \mathbf{s}(x)\}| > 1$

We can then not appeal to a competition with *quién*$_{(et)t}$ to explain the strong plural behavior of *quiénes*$_{(et)t}$.

Conclusions.

Conclusions.

To account for the behavior of bare interrogatives, Maldonado (2020) assumes that singular bare interrogatives are weak and plural bare interrogative strong.

We have sided with the weak singular / strong plural proposal, but, to avoid overgenerating uniqueness inferences, we have assumed that bare interrogatives range over conjunctions and disjunctions.

Conclusions.

What sets apart bare interrogatives from other DPs, for which there are reasons to assume a weak plural?

Conclusions.

There are other DPs that are morphologically singular but do not convey uniqueness:

(83) María probó alguna fruta exótica.
María tasted ALGUNA fruit exotic
'María tasted some exotic fruit(s).'

While *algún* is obligatorily distributive, it also allows for plural witnesses.

What is the connection, if any, with bare interrogatives?

Conclusions.

Thanks!

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