NPIs in Questions, Disjunction and Ellipsis

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Weak-NPIs in Questions

NPIs like *any* and *ever* are grammatical in most questions:

(1)a. Did Mary **ever** read *Syntactic Structures*?

b. Which students have **ever** read *Syntactic Structures*?

(2)a. John wonders whether Mary **ever** read *SS*.

b. John wonders which students have **ever** read *SS*.

Weak-NPIs in Questions

…but not all questions. E.g. not in **Alternative** Qs.

(3) a. Did Jon play chess or checkers? Alternative Y-N

b. Did **anyone** play chess or checkers? *Alternative ✓ Y-N

c. Jon wonders whether **anyone** played chess or checkers *Alternative /✓ Y-N

(Higginbotham 1993)

Alternative/Y-N ambiguity

(3) a. Did Jon play chess or checkers?

Alternative Interpretation

Presupposition: Jon played at least one of the two games.

Expected Answers: Jon played chess.
Jon played checkers

Y-N Interpretation

No Presuppositions

Expected answers: Yes, he played chess or checkers.
No he didn't play either.

.

Alternative Intonation

* *Did **anyone** play CHESS or CHECkers?*

Y-N Intonation

*Did **anyone** play chess or CHECkers?*

.

*Did **anyone** play chess or CHECkers?*

Expected Answers: Yes someone did.

No, nobody did.

Weak-NPIs in Questions

…but not all questions

E.g. Questions under *surprise* (Guerzoni&Sharvit2007)

(4)a. *It surprised Jon which students **ever** read *SS*.

b. Jon wondered which students **ever** read *SS*.

Weak-NPIs in Questions

Y/N	Alternative	Root-*wh*	Wonder-*wh*	Surprise-*wh*
✓	*	✓	✓	*

What Licenses NPIs in Questions

The Question Operator "?"/ the non veridical semantics of Questions?

…but NPIs are not acceptable in all questions

Whether/ Wh-phrases?

… but NPIs are not acceptable in all *whether* or *wh Q*

Some Question Embedding Predicates but not Others?

….but NPIs are not acceptable in alternative questions even in the complement of *wonder*.

NPIs and (the scope of) Negation

(5) a. * Mary ordered any Brussels sprouts

b. Mary did**n't** order **any** Brussels sprouts

c. ***Any** Brussels sprouts didn' t fall off her plate.

What if NPIs were licensed in the scope of negation also in questions?

If feasible, this theory would satisfy all the contenders: every theory of NPIs must be compatible with negations being licensers

Content of This Talk

Part I

A unified syntax/semantic analysis of Y-N and alternative interrogatives (in the spirit of Larson 1985)

==> The resulting analysis provides a straightforward explanation for the **Y-N/alternative contrast** in the acceptability of NPIs

Content of This Talk

Part II

A natural extension of the analysis in Part I to *wh*-questions:

==> The resulting analysis provides a straightforward explanation for the **wonder/surprise** contrast.

Weak-NPIs in Questions

Y/N	Alternative	Root-*wh*	Wonder-*wh*	Surprise-wh
✓	*	✓	✓	*

New(ish) View on Questions

Questions are traditionally analyzed as **sets of alternative answers**.

We see **disjunction** as one of the basic ways to provide alternative propositions, in *y/n,* alternative and even some *wh*-questions.

New(ish) View on Questions

We suggest an ellipsis-based fully unified syntactic and semantic analysis of:

(i) Alternative questions

(ii) Y/N-questions,

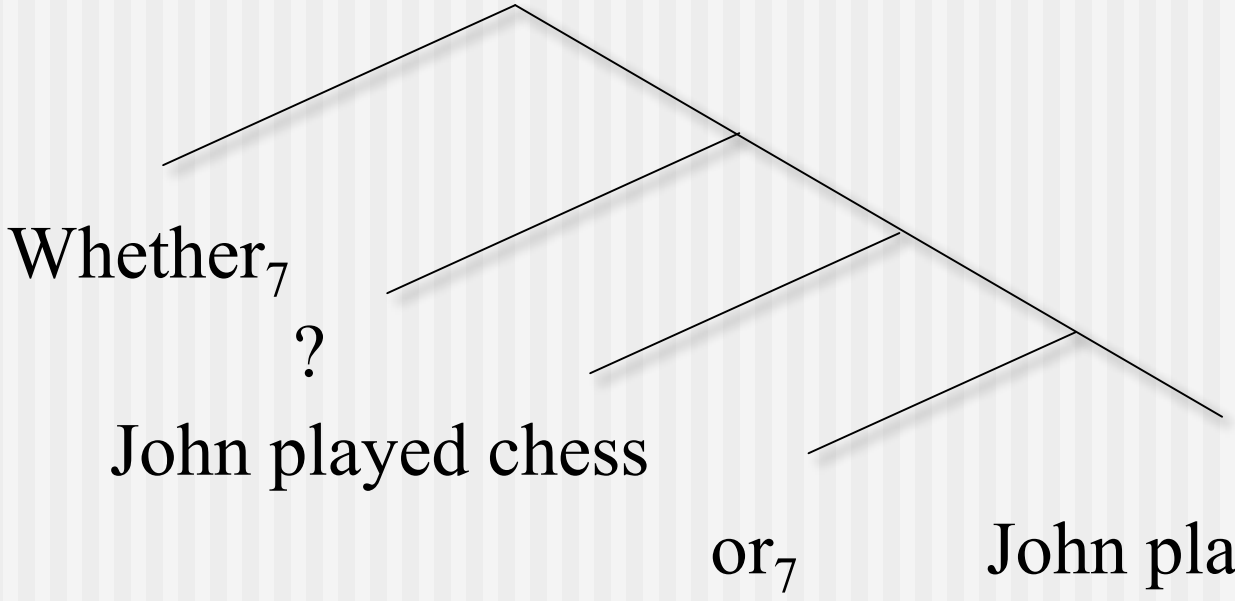
(iii) and the nucleus of

A. root WH-questions

B. wonder-wh questions

Alternative Questions

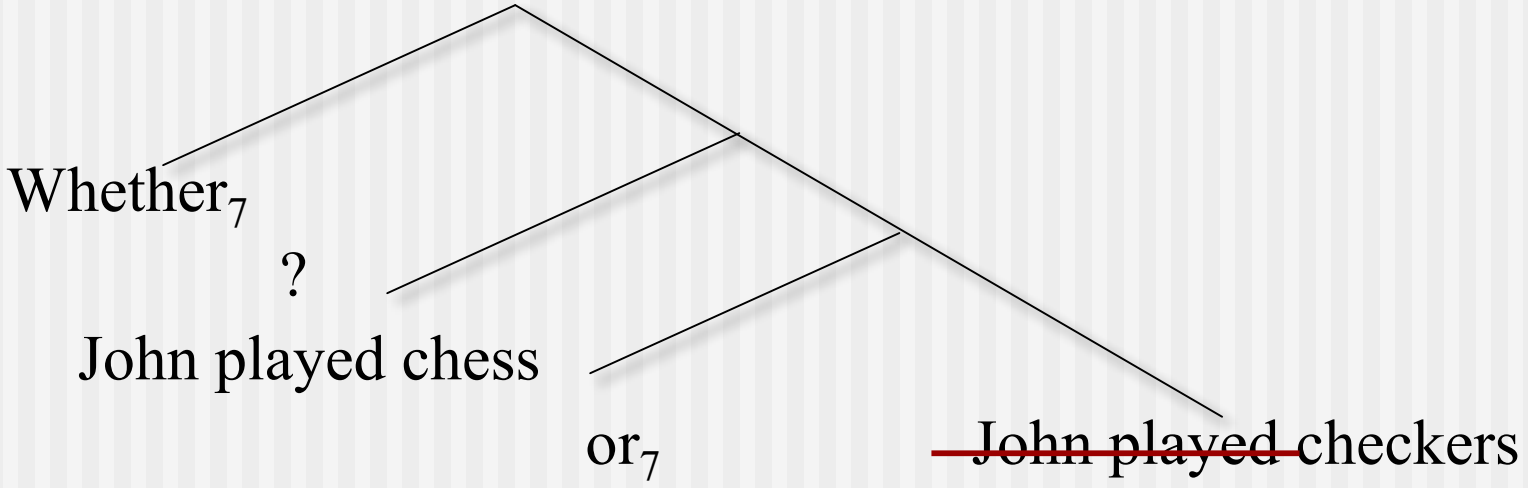
Underlying:



(C.f. Han and Romero 2004)

Alternative Questions

With Ellipsis



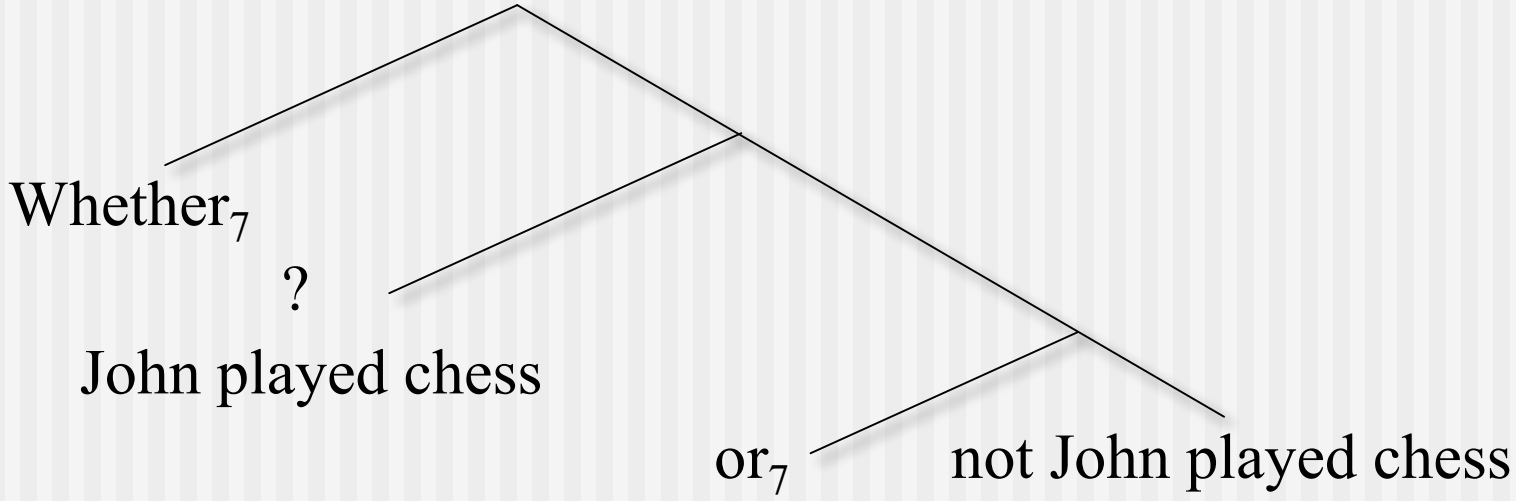
Y/N Questions: *whether p*

Did John play chess? /Whether <u>*John played chess*</u>

p

Y/N Questions: *whether p*

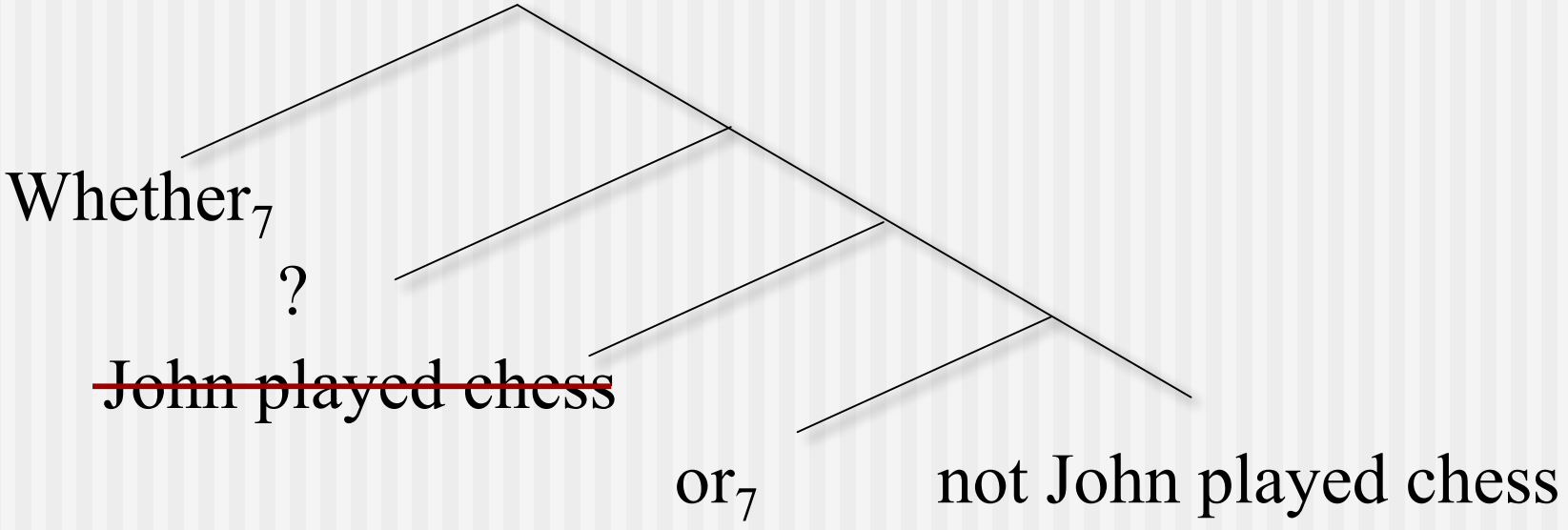
Underlying:



(see Larson 1985)

Y/N Questions: *whether p*

With Ellipsis: Option 1

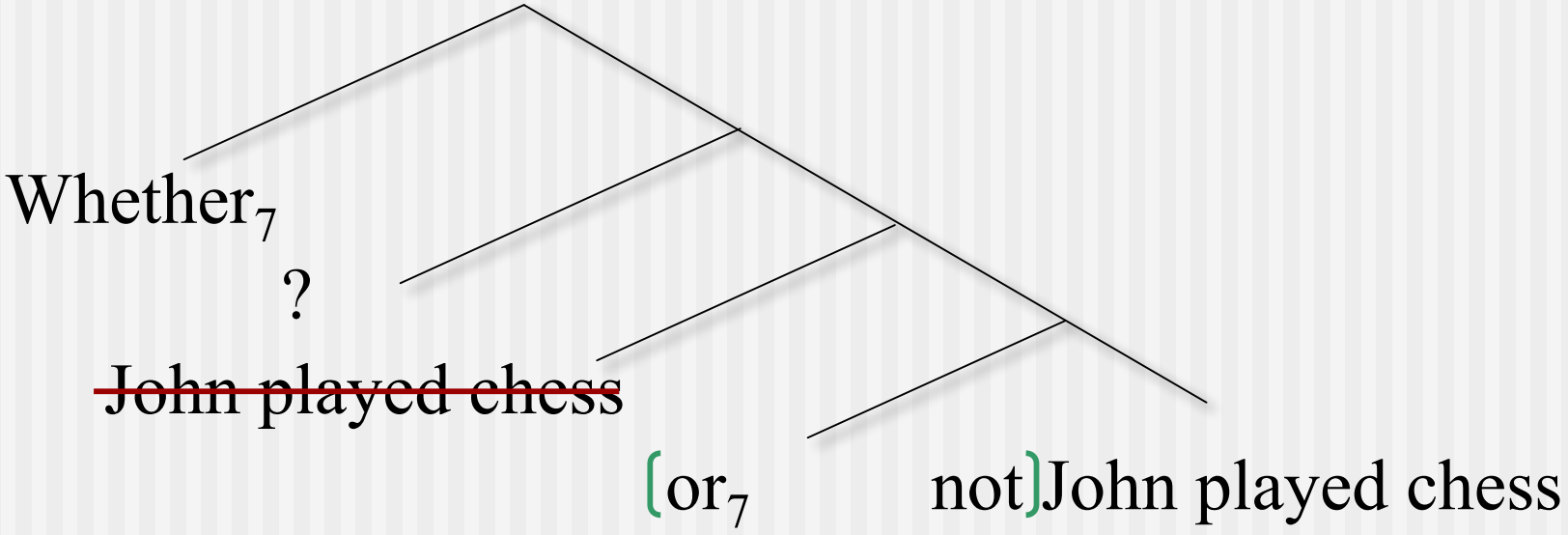


Without omission of *or not*: *Whether or not p*

(6) Whether or not John played chess

Y/N Questions: *whether p*

With Ellipsis: Option 1

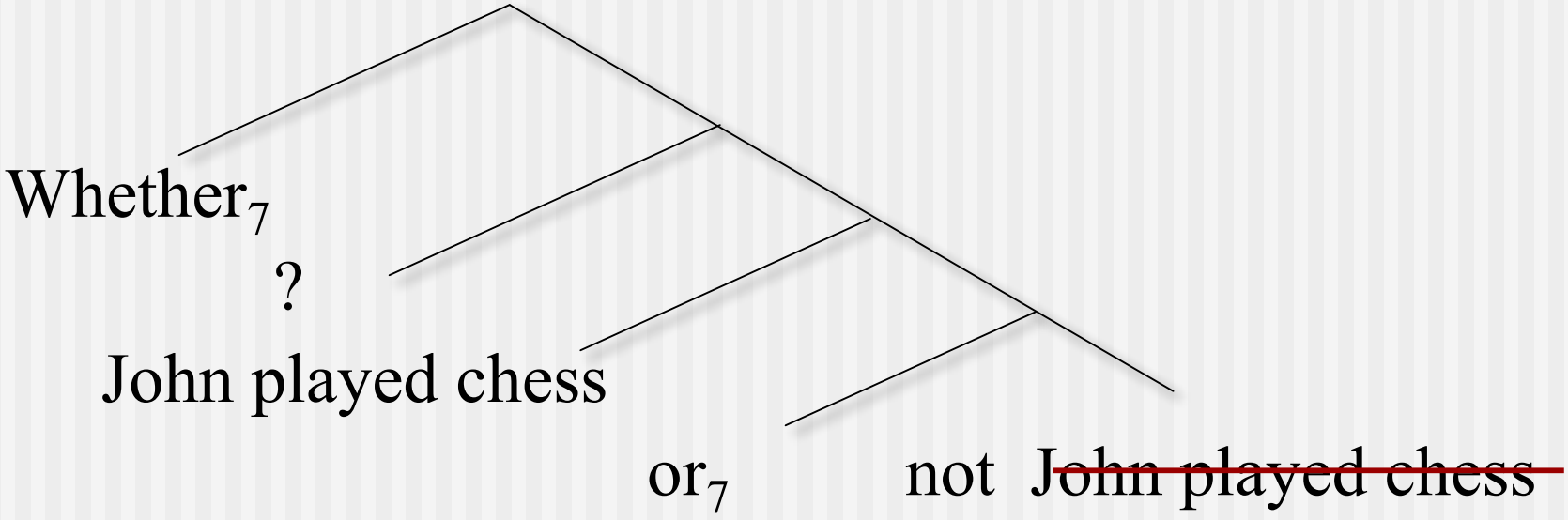


Without omission of *or not*: *Whether or not p*

(6) Whether or not John played chess

Y/N Questions: *whether p*

With Ellipsis: Option 2

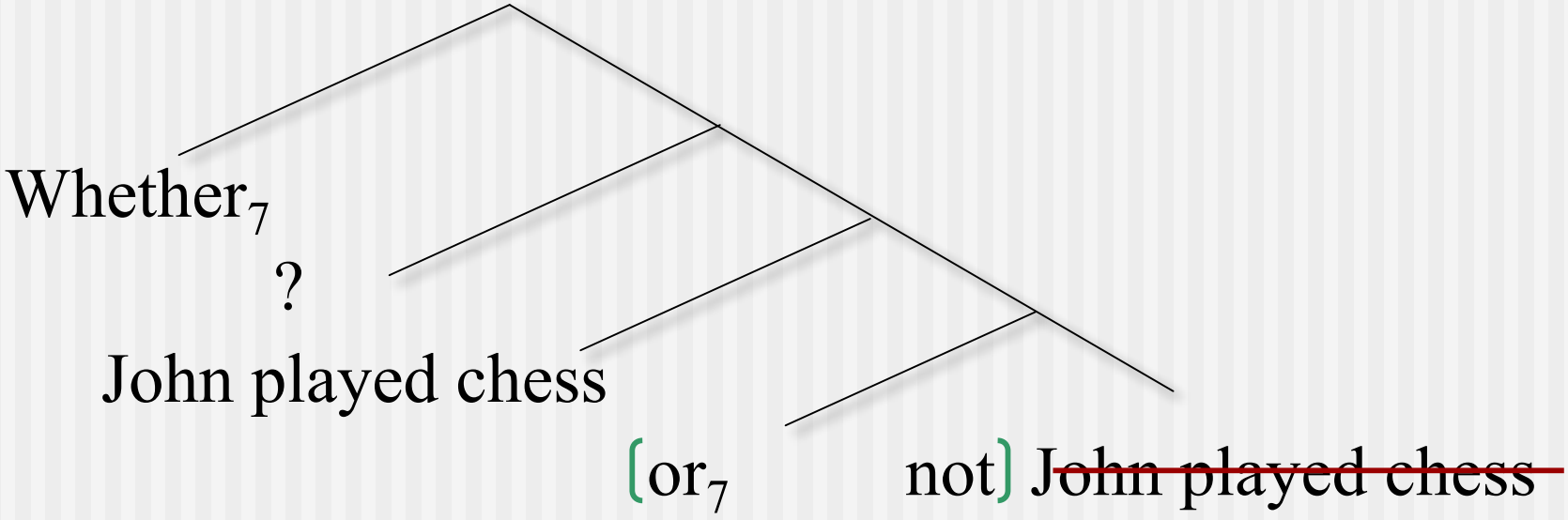


Without omission of *or not*: *Whether p or not*

(7) Whether John played chess or not.

Y/N Questions: *whether p*

With Ellipsis: Option 2



Without omission of *or not*: *Whether p or not*

(7) Whether John played chess or not.

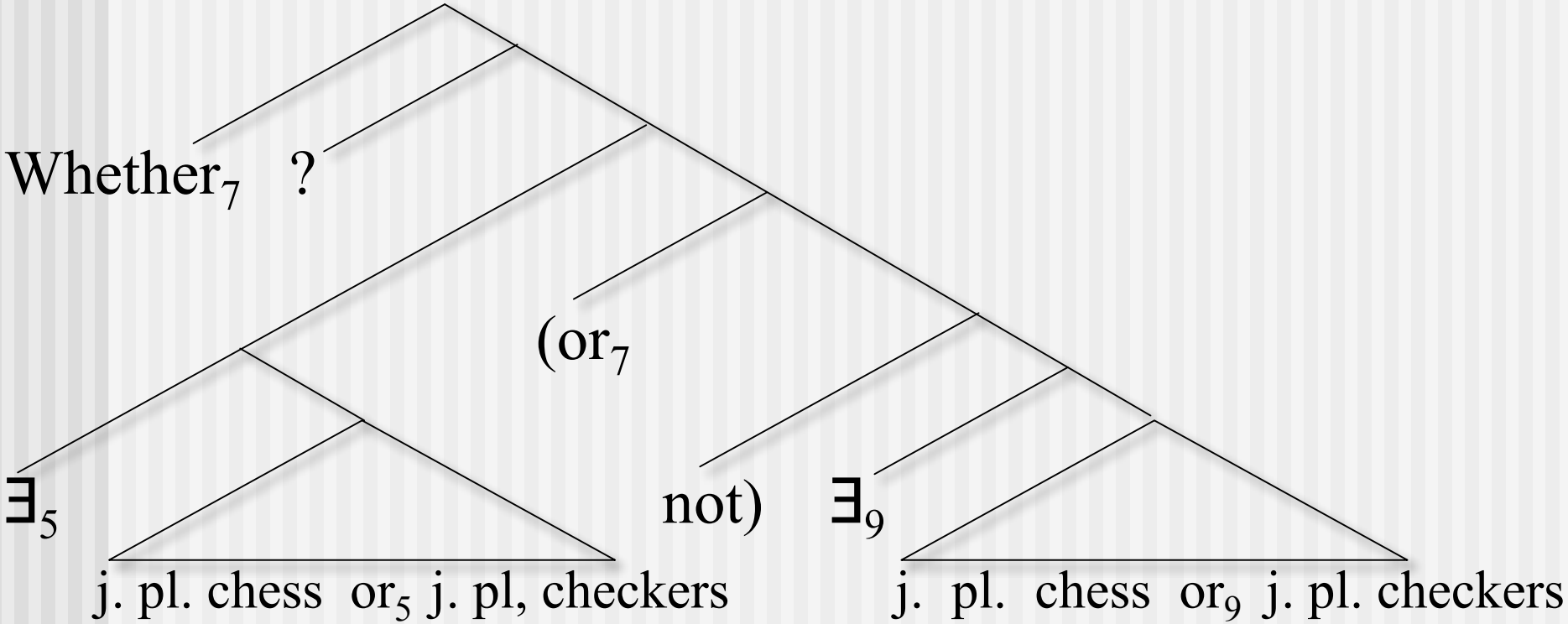
Y/N readings of *whether p* or *q*

Q: Did John play chess or checkers?
= Is it true that he did at least play one of the two games?

A: Yes, but I don't remember which.

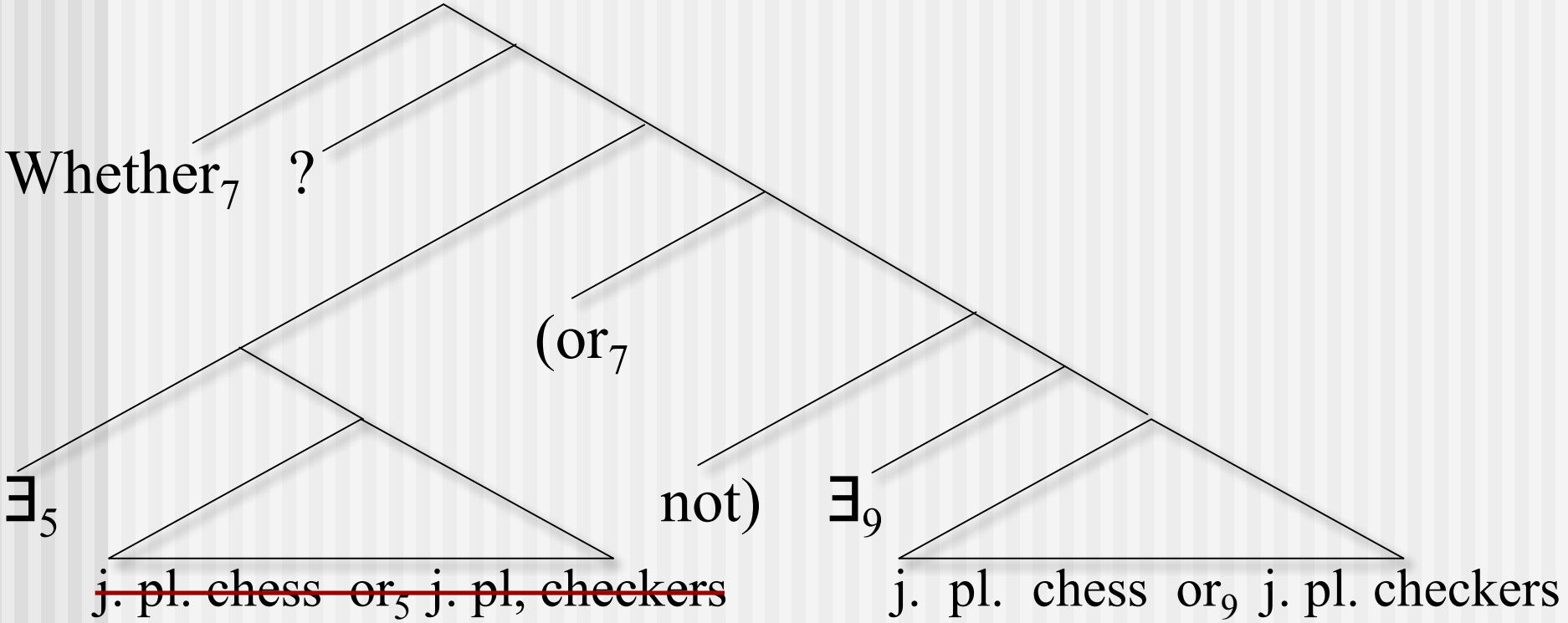
Y/N readings of *whether p* or *q*

Before Ellipsis:



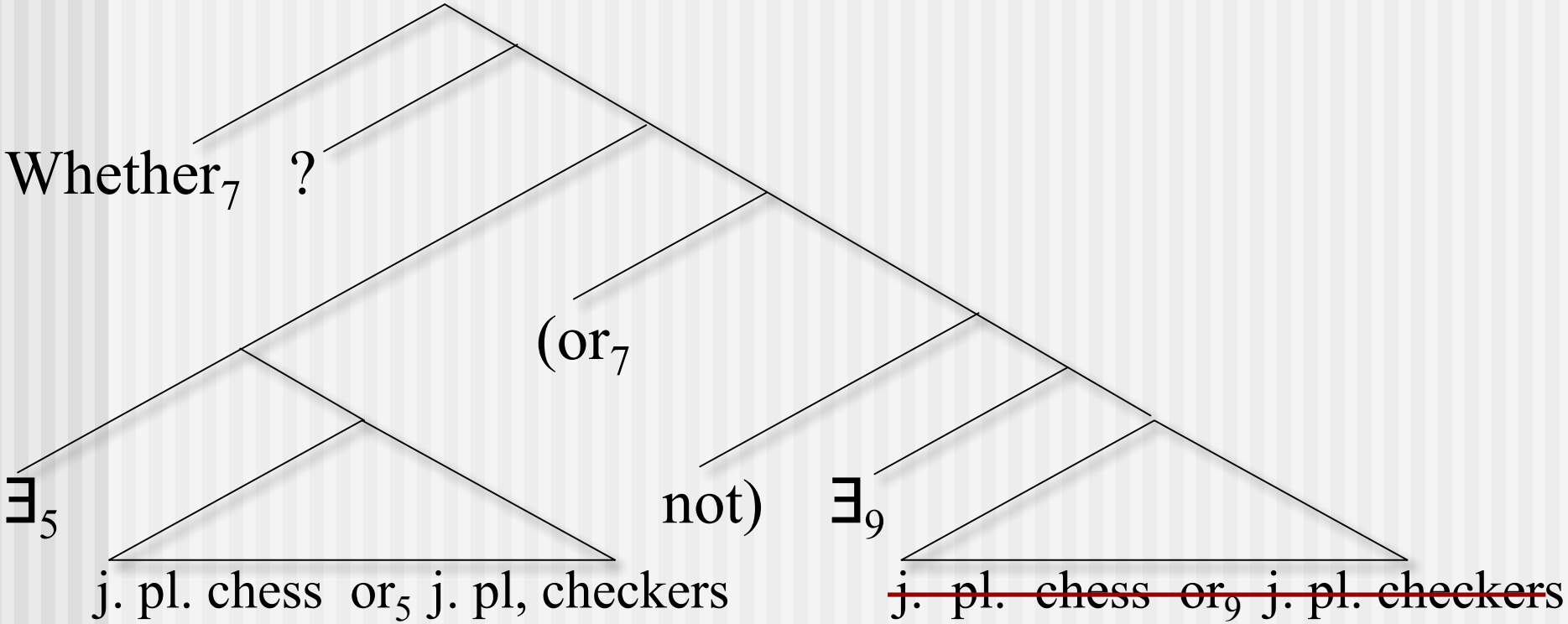
Y/N readings of *whether p* or *q*

With Ellipsis: Option1

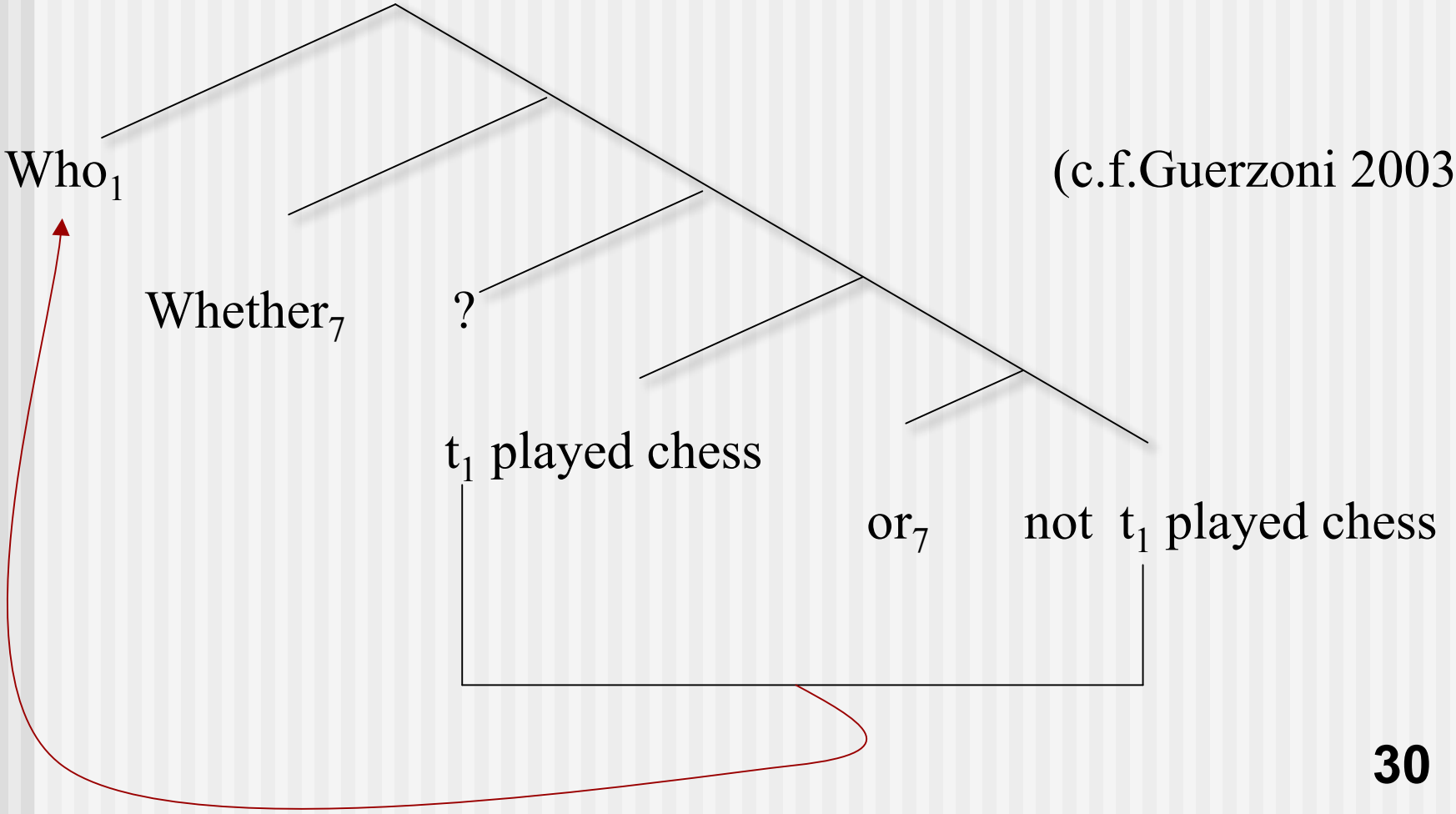


Y/N readings of *whether p* or *q*

With Ellipsis: Option 2



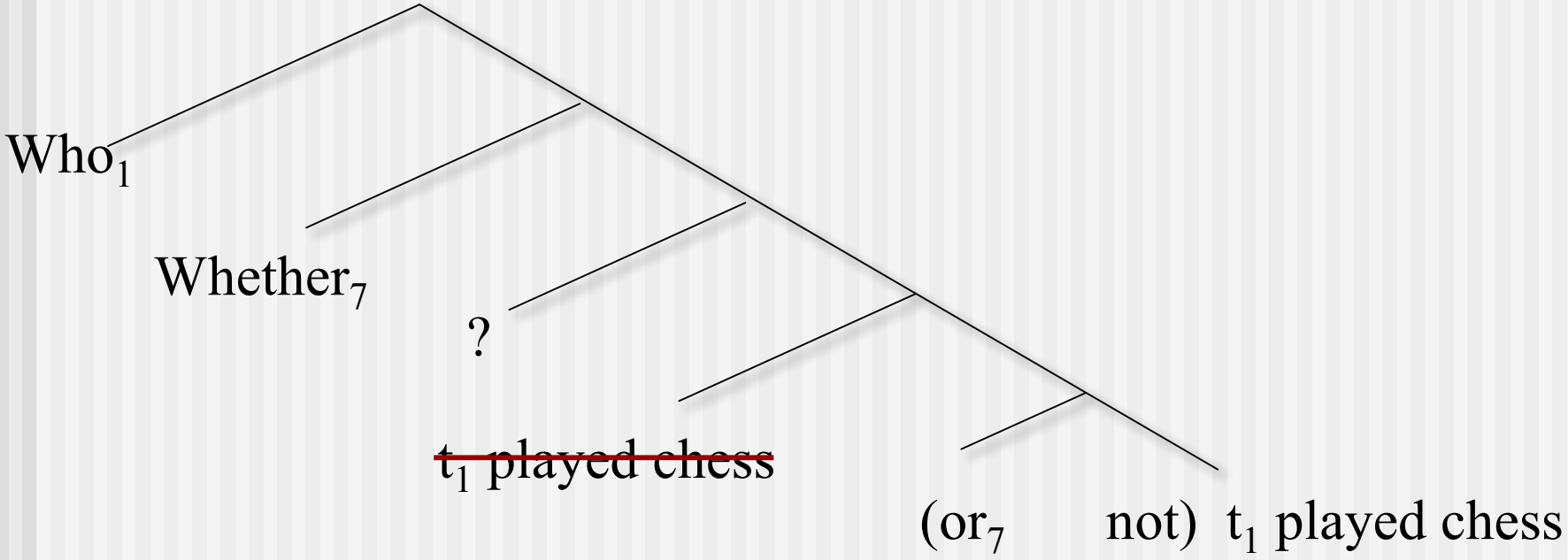
Root *Wh*-questions:



(c.f.Guerzoni 2003)

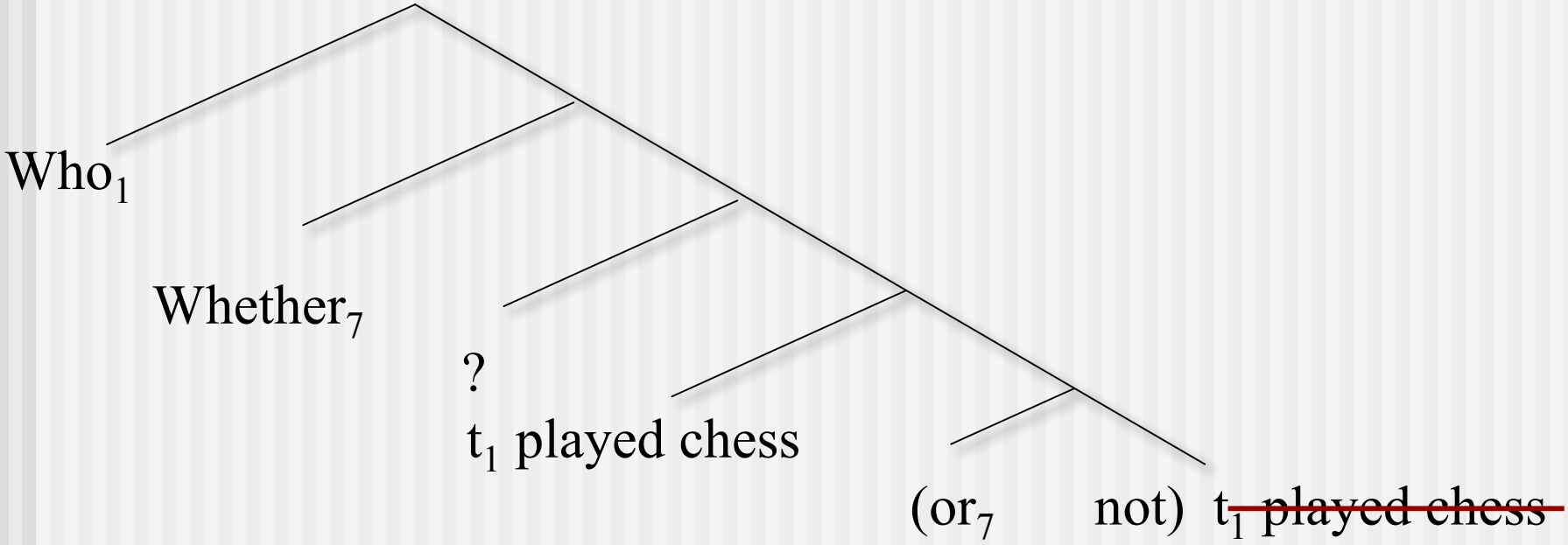
Root *Wh*-questions:

Option 1:



Root *Wh*-questions:

Option 2:



Evidence from Bulgarian: matrix and embedded Y-N questions obligatorily contain the 'question clitic' *li* (or its non clitic variant *dali*) ; *li* can, but doesn't have to co-occur with *wh*-words.

(1)a. Iska *(li) kafe?
want-3sg *li* coffee
'Does he/she want coffee?'

b. Čudja se/ ne znam iska *(li) kafe
wonder-1sg refl/not know-1sg want-3sg *li* coffee
'I wonder/ I don't know whether he/she wants coffee'

(2)a. S kogo li se e sres^tnal vc^era?
With whom *li* refl is met-participle yesterday?
'Who did you meet yesterday?'

b. S koi li studenti se e sres^tnal vc^era?
With which *li* student refl is met-participle yesterday?
'Which student did you meet yesterday?'

c. C^udja se kakvo li iska
wonder-1sg refl what *li* want-3sg
'I wonder what he wants'

Guerzoni (2003)

Summing up:

Alternative Questions

Whether CP_1 *or* CP_2

Y/N Questions

Whether CP_1 *or* ***not*** CP_1

Root Wh-questions

Wh-XP_1*Whether* $[_{CP1} \ldots t_1 \ldots]$ *or* ***not*** $[_{CP1} \ldots t_1 \ldots.]$

Consequensces

The syntax of *Y/N* Questions & root *Wh*-questions contains sentential negation, and may therefore license NPIs in its scope, the syntax of Alternative Questions does not contain negation and cannot license NPIs.

Weak-NPIs in Questions

Y/N	Alternative	Root-*wh*	Wonder-*wh*	Surprise-wh
✓	*	✓	✓	*

Basic Assumptions

- Partee and Rooth (1982)'s Heimian-indefnite semantics of *or*.
- Heim&Kratzer (1998)'s stepwise procedure for binding and quantification of the indefinite

Semantics

Indefinite *or*

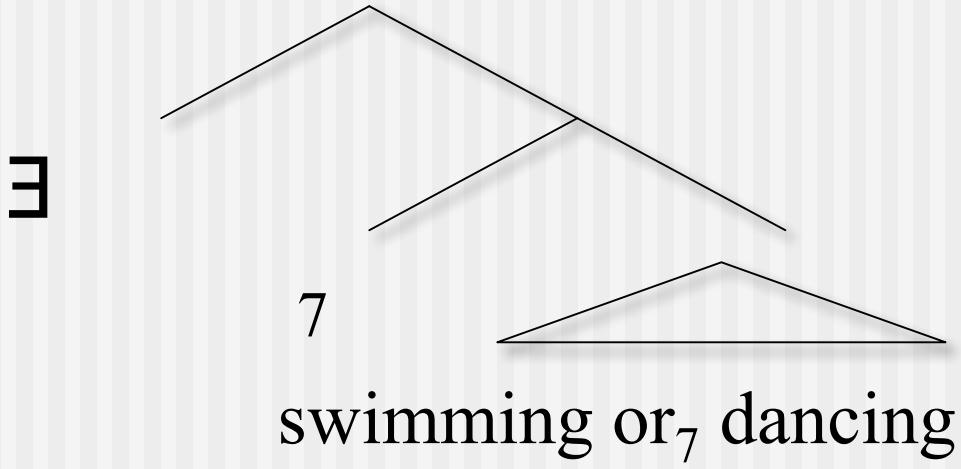
(8) $[\![\text{or}_i]\!]^g =$

$\lambda P_{<\sigma, t>}.\lambda Q_{<\sigma, t>}.\ \lambda x_{\sigma}.\ [g(i)= P \vee g(i)= Q\ ] \wedge g(i)(x)=1$

(9) $[\![\text{or}_i]\!]^g(P_{<\sigma, t>})(Q_{<\sigma, t>})$ = an open predicate of type $<\sigma, t>$, containing a variable restricted by the set {P, Q}

Existential Closure of "or"

(10) (Mary is) swimming or dancing.



Semantics

Existential Closure of "or"

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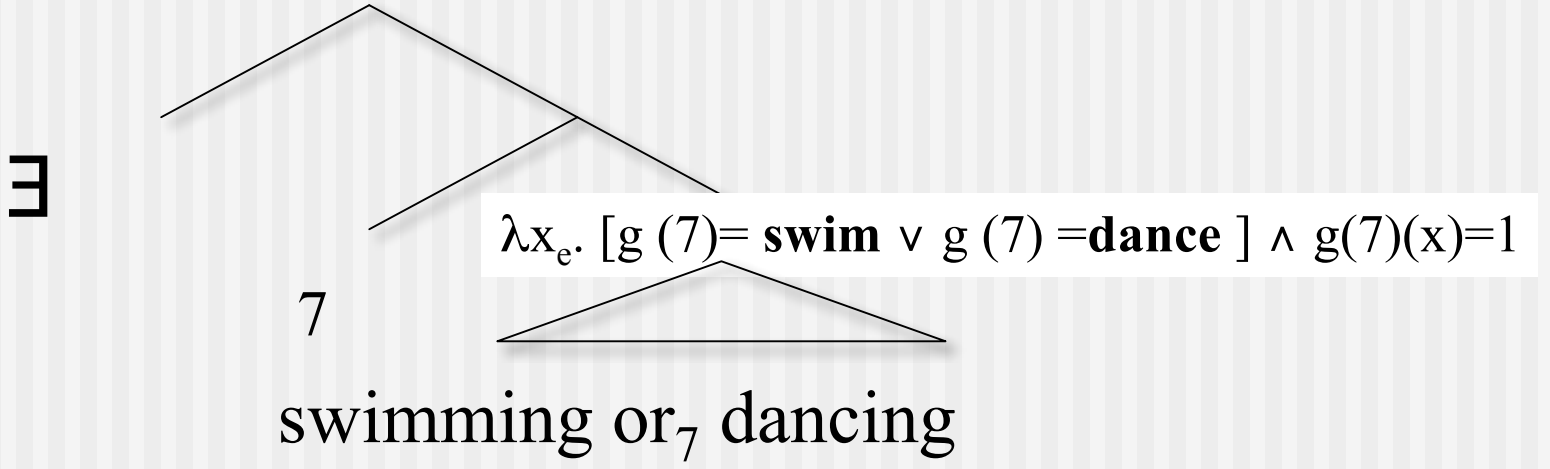

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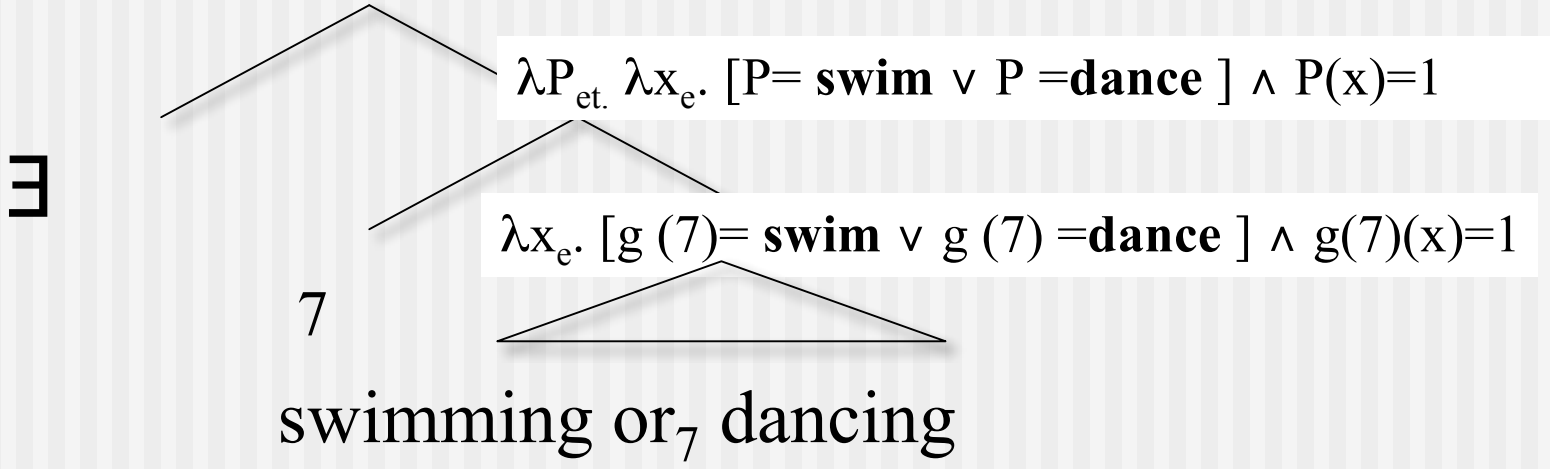

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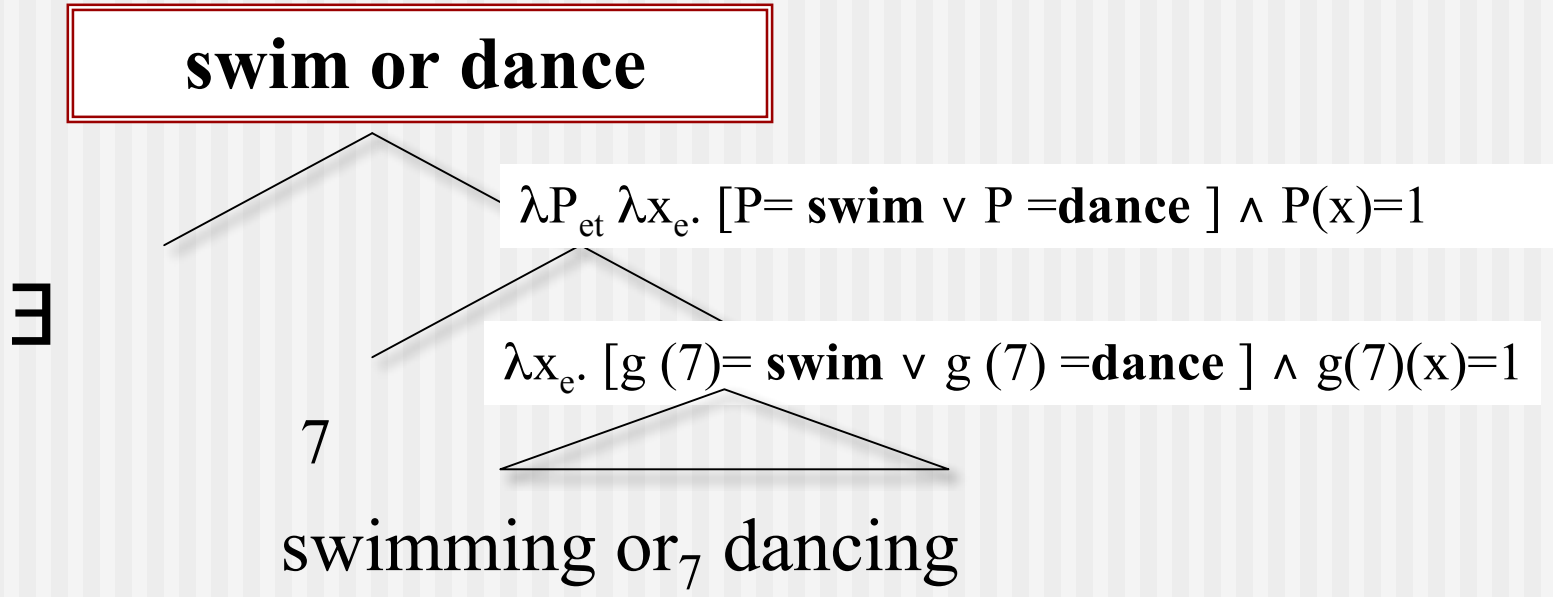


$[[\exists]] = \lambda S_{<et,\, et>}.\ \lambda x_{\,e}.\ \exists R_{\,<e,t>}$ s.t. S(R)(x)=1

Semantics

Whether A or B = Which of either A or B

"Historically, *whether* developed as the *wh*-counterpart of *either*, with the original meaning of *which of either A or B* [...] (Larson 1985, p.225)

Whether is greater, the gold or the temple?

(Jaspersen 1909-49, II p.200)

Whether

Our semantics of *whether* is that of *wh*-determiners (like *which, what*).

$[[\textit{whether}]]^w = \lambda Q_{<st,stt>}.\ \{q_{st}: \exists r_{st}\ [q \in Q(r) \wedge q(w) = 1]\}$

"Which proposition …..?"

(compare with:

$[[\textit{which}]]^w = \lambda Q_{<e,stt>}.\ \{q_{st}: \exists x_e\ [q \in Q(x) \wedge q(w) = 1]\}\}$

"Which individual…."

The restrictor *whether* is the predicate of (set of) propositions combined by disjunction.

Whether p or q

Whether Jon played chess or ~~Jon played~~ checkers

Semantics

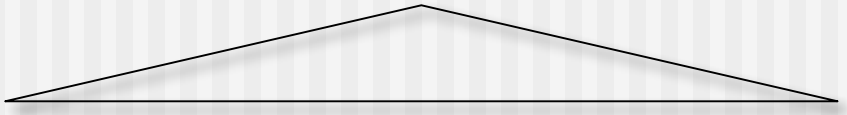
"or" as a restricted variable

Jon played chess or Jon played checkers

Abbreviations: **CH** = λw. Jon played chess in w

CHK = λw. Jon played checkers in w

$$\lambda w.[g(7)=\mathbf{CH} \vee g(7)=\mathbf{CHK}] \wedge g(7)(w)=1$$



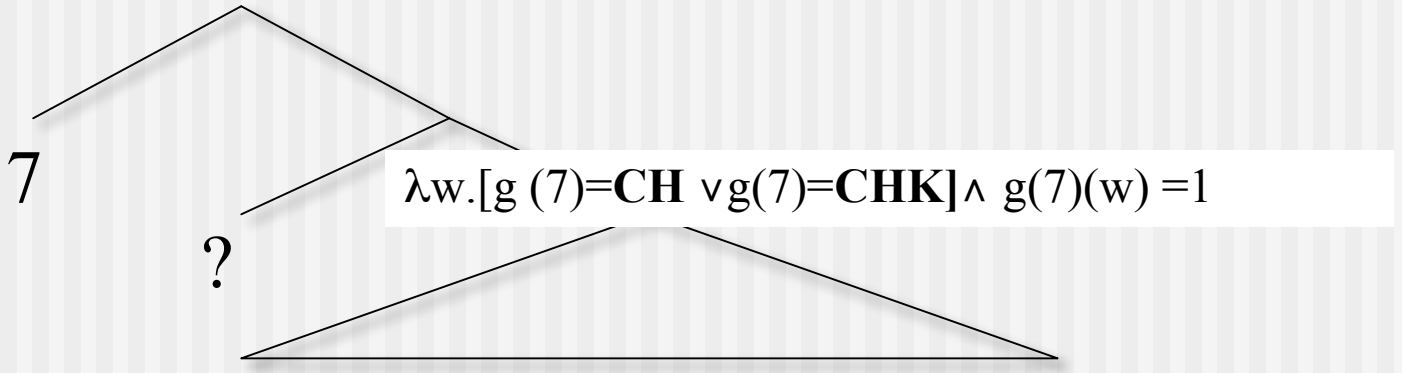
Jon played chess or_7 Jon played checkers

Semantics

Adding the question morpheme ? and binding *"or"*

[7 ? Jon played chess or$_7$ John played checkers]

$\lambda p_{st}.\ \{\lambda w.\ [p = \mathbf{CH} \vee p = \mathbf{CHK}] \wedge p(w) = 1\}$

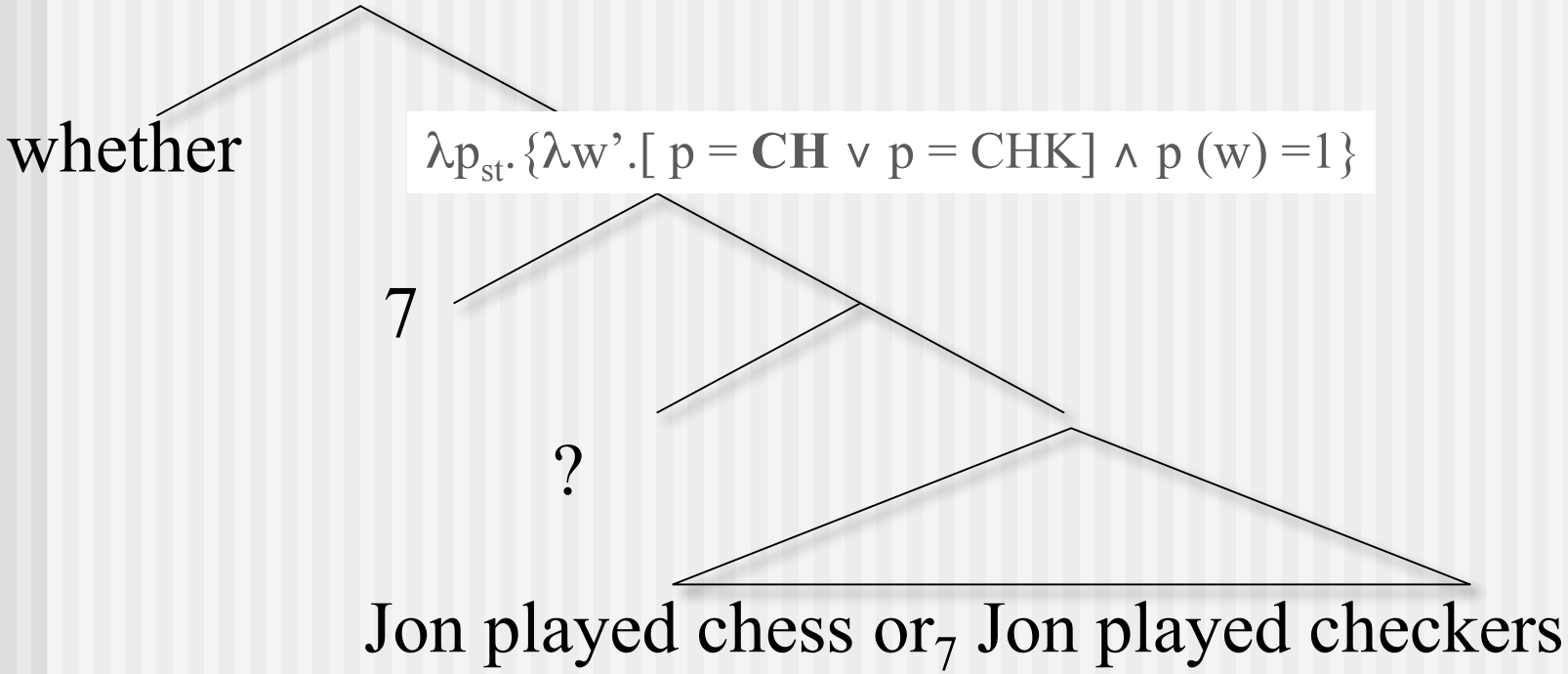


Jon played chess or$_7$ Jon played checkers

(c.f. Karttunen 1977 for the meaning of ?)

Semantics

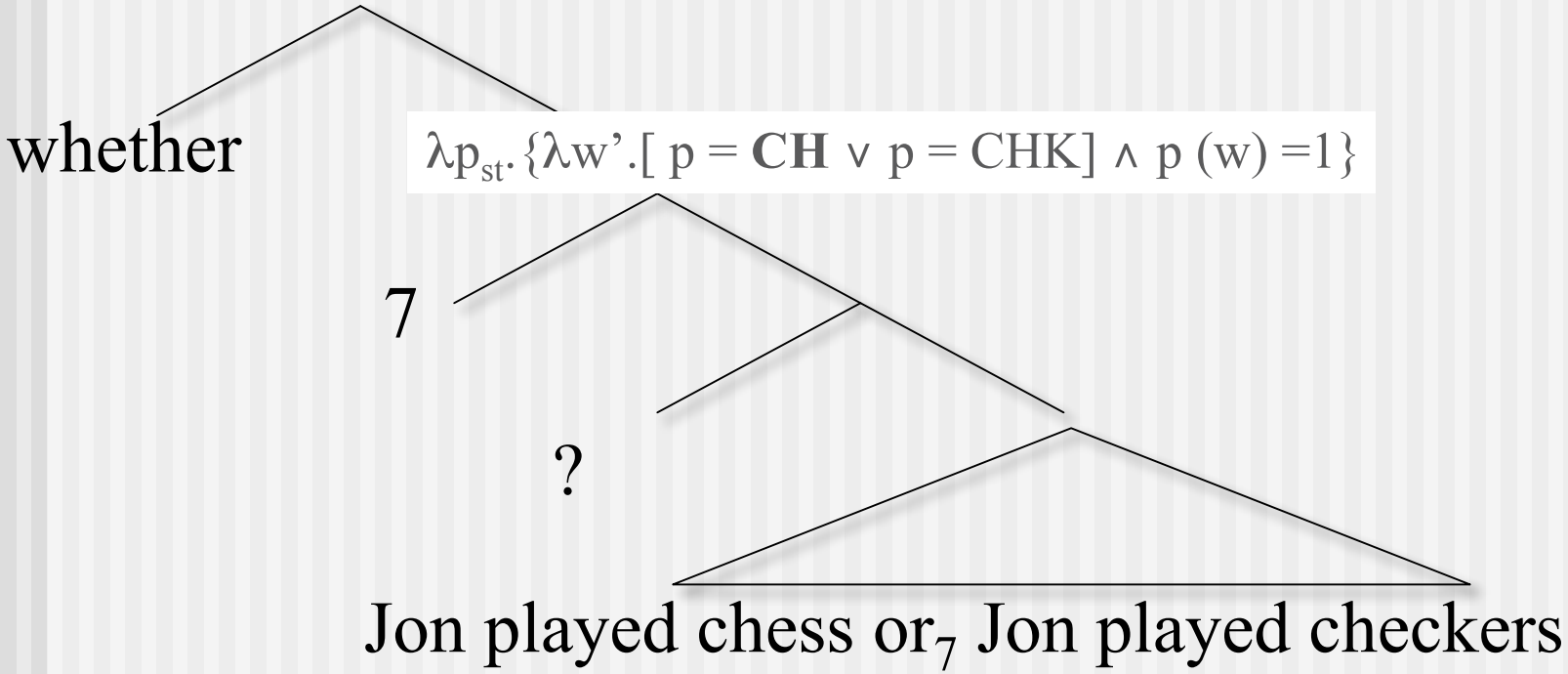
$[[\textit{whether}]]^w = \lambda Q_{<st,stt>}.\ \{q_{st}: \exists r_{st}\ [q \in Q(r) \wedge q(w) = 1]\}$



Semantics

$[[whether]]^w = \lambda Q_{<st,stt>}.\ \{q_{st}: \exists r_{st}\ [q \in Q(r) \wedge q(w) = 1]\}$

$\{q_{st}: (q = \mathbf{CH} \vee q = \mathbf{CHK}) \wedge q(w) = 1]\}$



Y/N Questions

Recall that….

Whether p or not: Whether Jon played chess or not

Whether or not p: Whether or not Jon played chess

Whether p: Whether Jon played chess

Have the Same Structure Before Ellipsis:

Whether p or not p:

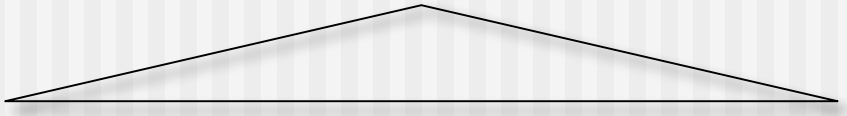
(11) Whether 7 ? Jon played chess or$_7$ not Jon played chess

Semantics

"or" as a restricted variable

Jon played chess or not Jon played chess

$$\lambda w.[g(7)=\textbf{CH} \vee g(7)=\textbf{not CH} \wedge g(7)(w)] = 1$$



Jon played chess or_7 not Jon played chess

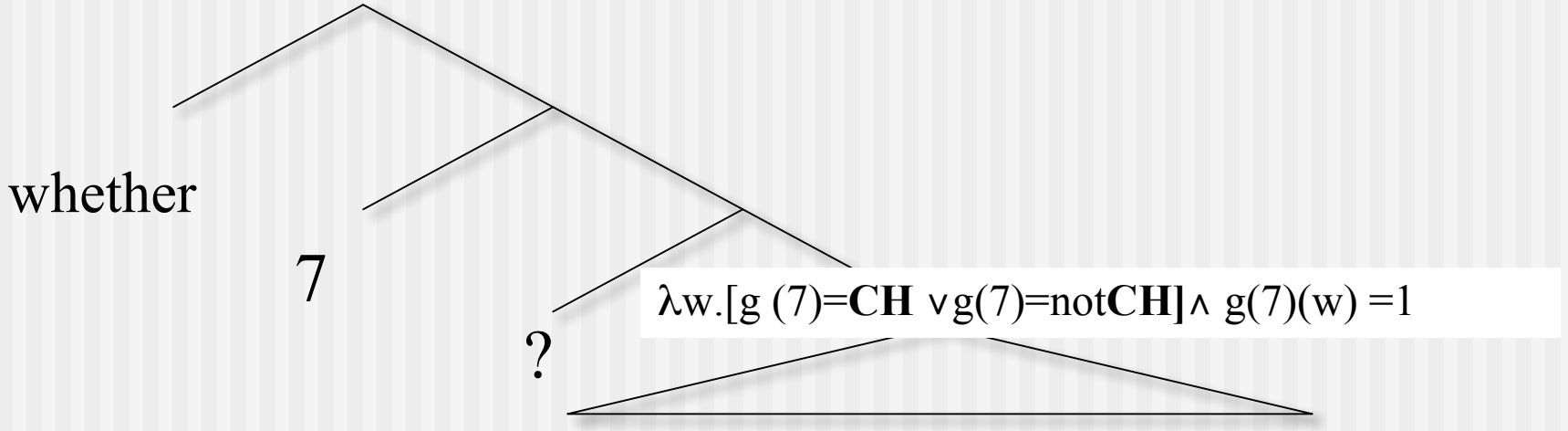
Abbreviations: **CH** = λw. Jon played chess in w

not CH = λw. Jon didn't played checkers in w

Semantics

$[[whether]]^w = \lambda Q_{<st,sst>}.\ \{q_{st}: \exists r_{st}\ [q \in Q(r) \wedge q(w) = 1]\}$

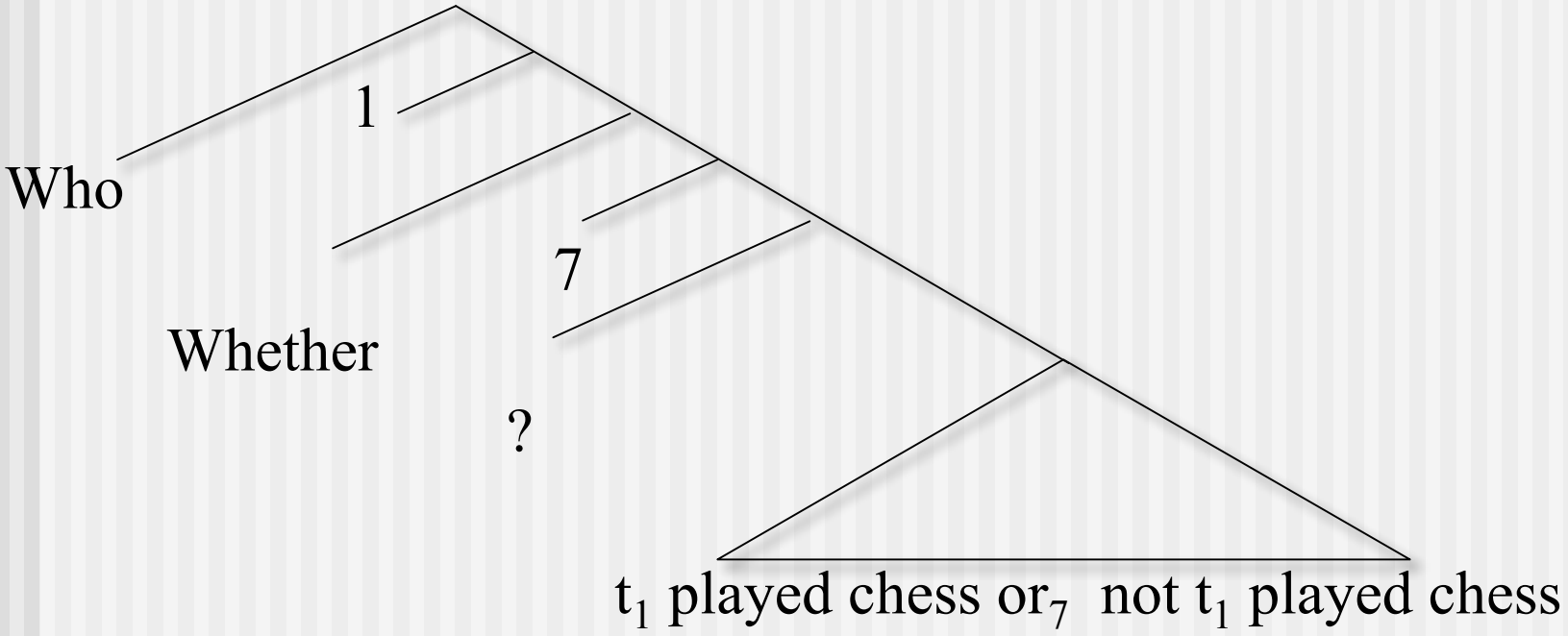
$\{q_{st}: [q = \mathbf{CH} \vee q = \mathbf{not\ CH}] \wedge q\,(w) = 1]\}$



Jon played chess or$_7$ not Jon played chess

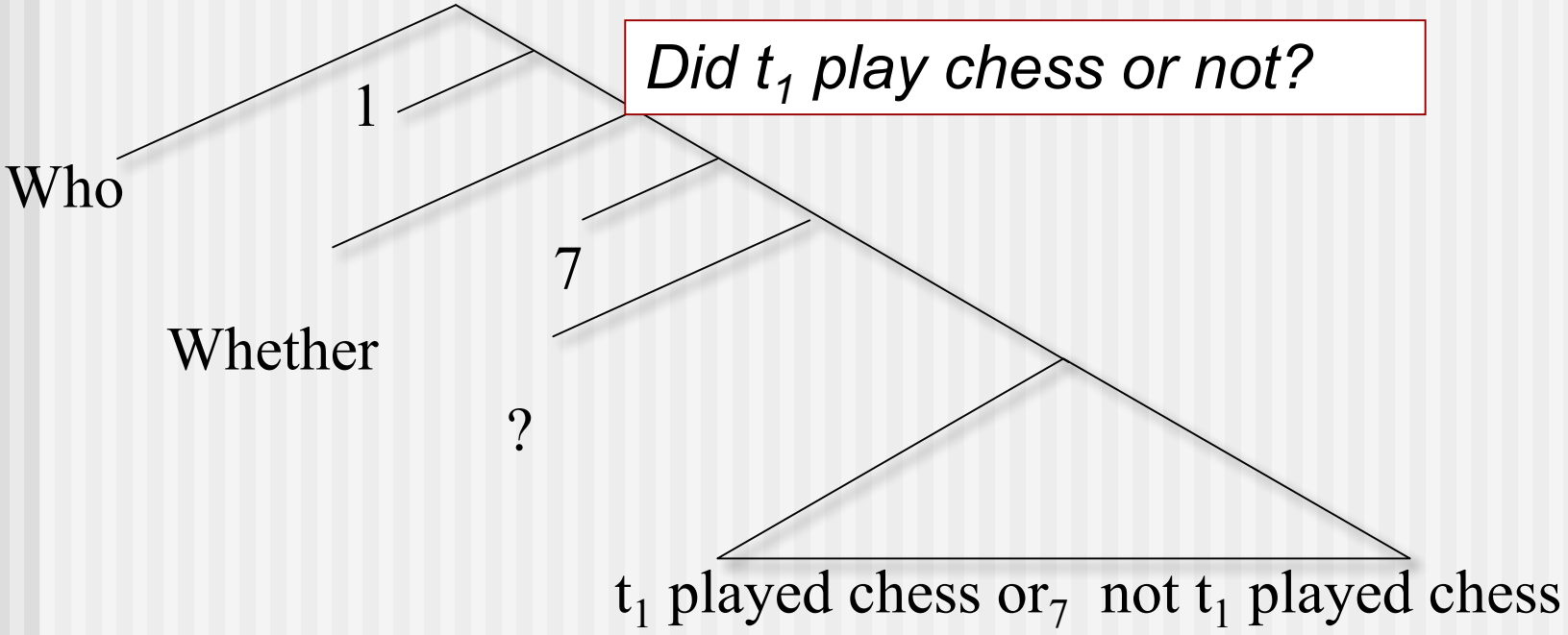
Wh-questions

Who played chess?



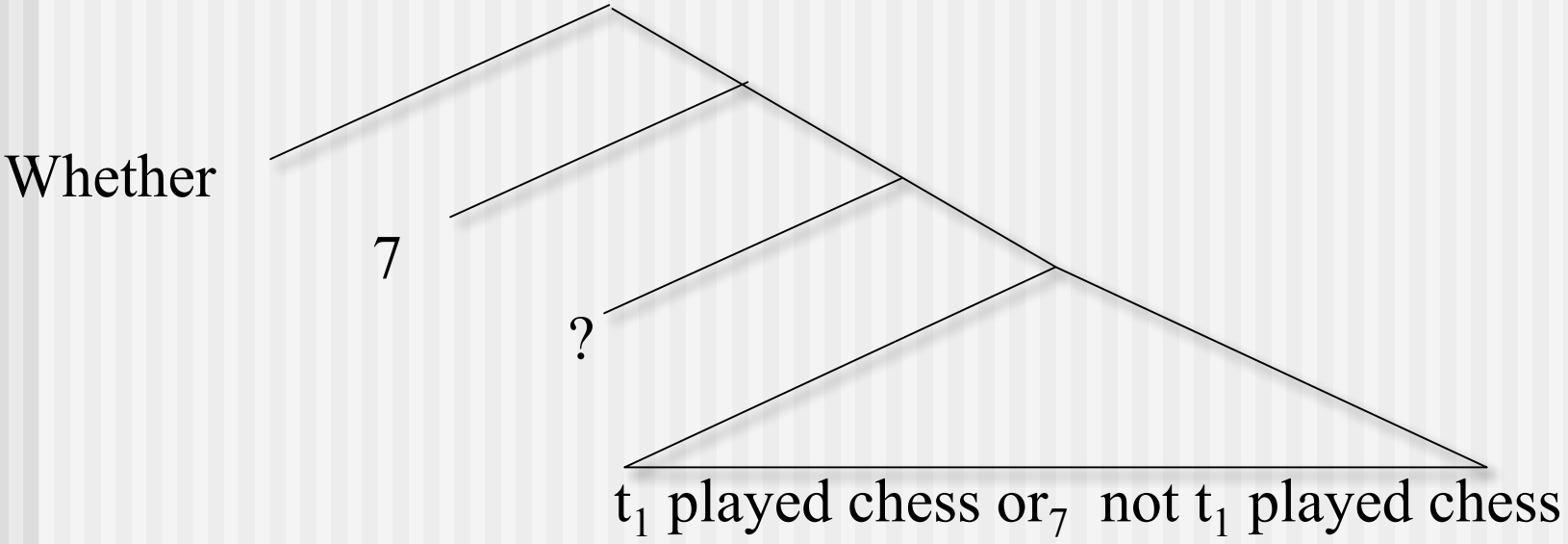
Wh-questions

Who played chess?



Wh-questions

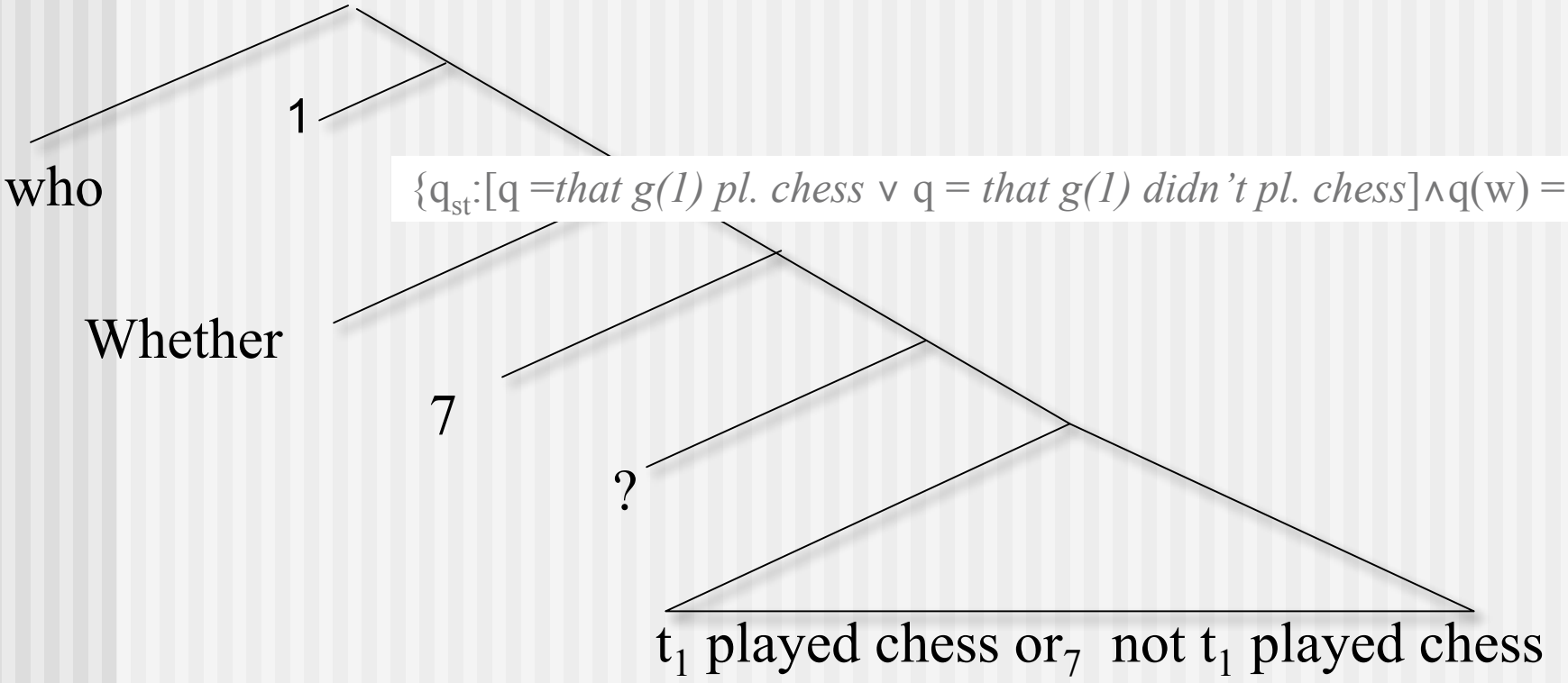
$\{q_{st}:[q = \textit{that g(1) pl. chess} \vee q = \textit{that g(1) didn't pl. chess}] \wedge q(w) = 1]\}$



Semantics

Wh-questions

$\{q_{st}:\exists x[q = \textit{that x pl. chess} \vee q = \textit{that x didn't pl. chess}] \wedge q(w) = 1\}$



Preliminary evidence from Italian:

Y/N

Mario si domanda se Giovanni sia (**o no)** venuto (/**o no).**
Mario wonders if John is-Subj (or not) come (/or not)
'Mario wonders whether (or not) John came (/or not)'

wh-

M. si domanda chi sia (o **no)** venuto (/o **no).**
M. wonders who is-Subj (or not) came (/or not)
'Mario wonders who came'

Refined Predictions

1. Scope

In Y/N, which do contain negation, NPIs are acceptable only if their overt occurence is **in the scope of that negation.**

(12) a. *[R] Mary wondered *whether* Jon has ever read Syntactic Structures or **not** Jon has ever read SS.

b. Mary wondered *whether* Jon has ever read Syntactic Structures **or not** Jon has **ever** read SS.

Refined Predictions

This correlates with Kayne's observation that ellipsis of *any* in declarative clauses is acceptable only when the overt *any* is in the negated clause.

(13) a. *Mary didn't buy any books about linguistics but John did buy **any** books about linguistics.

b. Mary bought any books about linguistics but John did**n't** buy <u>any</u> books about linguistics.

(Kayne 1994 n. 19, p. 146)

Refined Predictions

Corollary: *Whether p*

NPIs are acceptable in *whether p* questions, because these questions do admit an analysis in which they are in the scope of negation:

(14) (Whether) Jon has ever read read *Syntactic Structures*?

* whether$_1$?[J. has ever read *SS*](**or$_1$[not)** J. has ever read *SS*]

✓whether1?[J. has ever read *SS*](**or$_1$[not)** J. has ever read *SS*]

Weak-NPIs in Questions

Y/N	Alternative	Root-*wh*	Wonder-*wh*	Surprise-wh
✓	*	✓	✓	*

Weak-NPIs in Questions

Y/N		Alternative	WH		
Whether or not p *Whether p*	*Whether p or not*		root	Wonder	Surprise
✓	*	*	✓	✓	*

?

Refined Predictions

3. Wonder vs. Surprise:

Predicates like *surprise* do not admit *whether (or not)* complements,

(14) a. *It surprised Susan whether (or not) Mary called.

Wonder-predicates do admit *whether or not* complements

(15) a. Susan wondered whether (or not) Mary called

(Guerzoni 2003, Guerzoni and Sharvit 2007)

Refined Predictions

=> wh-complements of *surprise* may not contain a y/n question

(16) It surprised Susan [which students]$_1$ [? [t_1 read SS]]

=> wh-complements of *Wonder* predicates may:

(17)Susan wonders/knows [which students]$_1$ [whether [t_1 ever read SS (or not) t_1 read SS]]

This relates to the difference between Weak and Strong Exhaustivity (see Heim 1994, Guerzoni 2003, and Guerzoni and Sharvit 2007)

Refined Predictions

Wh-complements of *surprise* contain no negation and disallow NPIs:

(18) *It surprised Susan which students **ever** read SS.
surprise[which students]$_1$ [? [t_1 **ever** read SS]]

Wh-complements of w*onder predicates* do admit admit NPIs:

(15) a. Susan wondered whether Mary called
b. Susan wondered/knows which students **ever** read SS.
wonder[which students]$_1$ [whether [t_1 ever read SS (or not) t_1 **ever** read SS]]

Weak-NPIs in Questions

Y/N		Alternative	WH		
Whether or not p *Whether p*	*Whether p or not*		root	Wonder	Surprise
✓	*	*	✓	✓	*

Conclusions:

A unified syntax/semantics of:

- y/n questions
- alternative questions
- nuclei of root and SE *wh*-questions

In terms of $whether_i$ …or_i

Provides a satisfactory account of the complex pattern of NPIs in Interrogative Sentences.

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Appendix I: Beyond English:

(1) ✓*Whether CP* with NPI

Dan si chiedeva se Mira fosse **mai** stata in Francia.
Dan wonder-past if Mira be-past-subj **ever** be-participle in-France
'Dan wondered whether Mira had **ever** been to France' **Italian**

Dan taha im Mira ey-pa'am hayta be-Carfat
Dan wonder-past if Mira ever be-past in-France
'Dan wondered whether Mira was ever in France' **Hebrew**

(2) ✓*Whether CP or not CP* w/o NPI

Dan si chiedeva se Mira fosse stata in Francia **o no**
Dan wonder-past if Mira be-past-subj be-participle in-France or not
'Dan wondered whether Mira had been to France or not' **Italian**

Dan taha im Mira hayta be-carfat o lo
Dan wonder-past if Mira be-past in-France or not
'Dan wondered whether Mira was in France or not' **Hebrew**

(3) *[R]*Whether CP or not CP* with NPI

*[R]Dan si chiedeva se Mira fosse **mai** stata in Francia **o no**?
Dan wonder-past if Mira be-past-subj **ever** be-prt in-France or or not
Italian

*[R]Dan taha im Mira ey-pa'am hayta be-carfat o lo
Dan wonder-past if Mira ever be-past in-France or not
Hebrew

No *whether or not p* in either language:

(4) **Whether or CP not CP* w/o NPI

*Dan si chiedeva se o no Mira fosse stata in Francia
Dan wonder-past if or not Mira be-past-subj be-participle in-France
Italian

*Dan taha im o lo Mira hayta be-carfat
Dan wonder-past if or not Mira be-past in-France
'Dan wondered whether or not Mira was in France '
Hebrew

Other structures with overt *or not*

Hebrew: *whether yes CP or no CP*

(5) *Whether [yes CP or no CP]*

?Dan taha im ken o lo Mira hayta be-carfat
Dan wonder-past if yes or not Mira be-past in-France
'Dan wondered whether or not Mira was in France '

(6) *Whether [yes CP or no CP]* with NPI

?Dan taha im ken o **lo** Mira **ey-pa'am** hayta be-carfat
Dan wonder-past if yes or **not** Mira **ever** be-past in-France
'Dan wondered whether or not Mira was ever in France '

Italian: *VP or not VP*

(7) ✓*Whether XP Aux [VP or not VP]* w/o NPI

Dan si chiedeva se Mira fosse **o no** stata in Francia.
Dan wonder-pst if Mira be-pst-sbj or not be-participle in-France
'Dan wondered whether Mira had or not been to France'.

(8) ✓*Whether [XP Aux [mai VP or not mai VP]* with NPI

Dan si chiedeva se Mira fosse o no **mai** stata in Francia.
Dan wonder-pst if Mira be-pst-sbj or not **ever** be-prt. in-France
'Dan wondered whether Mira had or not ever been to France'.

(9) *Whether [XP Aux [mai VP or not VP]* with NPI
Dan si chiedeva se Mira fosse o no stata in Francia.
Dan wonder-pst if Mira be-pst-sbj or not **ever** be-prt. in-France
'Dan wondered whether Mira had or not ever been to France'.

(10)**Whether [XP Aux [mai VP or not mai VP]* with NPI
Dan si chiedeva se Mira fosse **mai** o no stata in Francia.
Dan wonder-pst if Mira be-pst-sbj or not **ever** be-prt. in-France
'Dan wondered whether Mira had or not ever been to France'.

(11) **Whether [XP Aux [mai [VP or not VP]* with NPI
*Dan si chiedeva se Mira fosse **mai** o no stata in Francia.
Dan wonder-pst if Mira be-pst-sbj **ever** or not ever be-prt. in-France
'Dan wondered whether Mira had ever or not been to France'.

Appendix II: Calculation

Whether 7 ? John played chess or$_7$ checkers

Lexical Entries:

$[\![\text{ or}_{7<st,<st,st>>}]\!]^{g,w} = \lambda p_{<s,t>} . \lambda q_{<s,t>} . \lambda w'.\ [g(7) = p \vee g(7) = r] \wedge g(7)(w') = 1$

$[\![?]\!]^{g,w} = \lambda q_{st} . \{q\}$ (c.f. Karttunen 1977)

$[\![\textit{whether}]\!]^{g,w} = \lambda S_{<st,stt>} . \{p_{<st>} : \exists r_{<s,t>} \text{ s.t. } p \in S(r) \ \& \ p(w)=1\}$

Calculation:

$[\![\text{ or}_7]\!]^{g,w} ([\![\textit{John played chess}]\!]_{¢}) (([\![\textit{John played checkers}]\!]_{¢}) =$

$\lambda w'.\ [g(7) = \mathbf{CH} \vee g(7) = \mathbf{CHK}] \wedge g(7)(w') = 1$

This proposition is g(7) if g(7) is either *that John played chess* or *that John played checkers,* otherwise it is a contradiction.

$[\![? \textit{ John played chess or}_7 \textit{ checkers}]\!]^{g,w} =$

$\{\lambda w'.\ [g(7)= \mathbf{CH} \vee g(7)= \mathbf{CHK}\ ] \wedge g(7)(w')= 1\}$

$[[\ 1\ ?\ \textit{John played chess or}_7\ \textit{checkers}]]^{g,w} =$
$\lambda p_{st}.\ \{\lambda w'.\ [p= \mathbf{CH} \vee p= \mathbf{CHK}] \wedge p(w') = 1\}$

$[[\textit{whether 7 ? [[John played chess] or}_7\ \textit{[John played checkers]]}\ ]]^{g,w} =$
$= [\ \ [\textit{whether}]]^{g,w}\ (\lambda p_{st}.\ \{\lambda w'.\ [p= \mathbf{CH} \vee p= \mathbf{CHK}] \wedge p(w') = 1\})$

$= \{q_{st}: \exists r_{st}\ \text{s.t.}\ q \in [\lambda p_{st}.\ \{\lambda w'.\ [p= \mathbf{CH} \vee p= \mathbf{CHK}] \wedge p(w') = 1\}]\ (r)\ \ \&\ q(w)=1\}$

$= \{q_{st}: \exists r_{st}\ \text{s.t.}\ q \in \{\lambda w'.\ [r = \mathbf{CH} \vee r= \mathbf{CHK}\ ] \wedge r\ (w')= 1\} \wedge q(w)=1\}$

$= \{q_{st}: \exists r_{st}\ \text{s.t.}\ q = \lambda w'.[r = \mathbf{CH} \vee r = \mathbf{CHK}] \wedge r\ (w')= 1] \wedge q(w)=1\}$

because of the condition $\exists r_{st}$ s.t. $q = \lambda w'.[r = \mathbf{CH} \vee r = \mathbf{CHK}] \wedge r\ (w')= 1]$
there are only 3 possible values for q: **CH, CHK** or $\perp$,

$= \{q_{st}: (q = \mathbf{CH} \vee q = \mathbf{CHK} \vee q = \perp\ ) \wedge q(w)=1\}$

But given the condition q(w)=1, q cannot be $\perp$,

$= \{q_{st}: \exists r_{st}\ \text{s.t.}\ (q = \mathbf{CH} \vee q = \mathbf{CHK}) \wedge q(w)=1\}$