Can questions be directly disjoined?

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CLS 51

Agenda

- Observe that complement questions can be either directly or indirectly conjoined, but they can only be indirectly disjoined.
- What theories of questions and coordination predict this difference?
- Look at

Partition theory (Groenendijk & Stokhof 1984),

Inquisitive Semantics (Groenendijk & Roelofsen 2009, Ciardelli et al. 2012)

Two ways to coordinate clauses A, B

- First coordinate, then possibly lift (direct method)

A and/or B =lift=> λP[P(A and/or B)]

λP[P(A and/or B)] (Mary_found_out) =

Mary_found_out (A and/or B)

- First lift, then coordinate (indirect method)

A =lift=> λP[P(A)]

B =lift=> λP[P(B)]

λP[P(A)] and/or λP[P(B)] = λP[P(A) and/or P(B)]

λP[P(A) and/or P(B)](Mary_found_out) =

Mary_found_out A and/or Mary_found_out B

Lifting A to λP[P(A)] is nothing but designating A to be the argument of some P.

Is lifting just a free type-shifting operation?

Subordinating complementizers (i.e. not pure clause-typers) can be seen as lifters.

When lifting interacts with coordination, the two methods may make a semantic difference.

Some support from English that-complements, and from languages that have subordinators also in wh-complements (Hungarian, Korean, etc.).

Presence of subordinators correlates with what units are lifted

It surprised Sue

(1a) that John was drunk and Mary was driving. =/=

(1b) that John was drunk and that Mary was driving.

(2a) that John drank or Mary gambled. =/=

(2b) that John drank or that Mary gambled.

(3a) I believe that John drinks or Mary gambles. =/=

(3b) ?? I believe that John drinks or that Mary gambles.

(4) He told me which girl he likes and
#(that) he is going to ask her out.

Hungarian hogy
is an invariant subordinator

Tudom, hogy hol van Mari. wh-complement
know-I subord where is Mari

Tudom, hogy Mari Londonban van. declarative c.
know-I subord Mari London-in is

Tudom, hogy Mari Londonban van-e. polar int c.
know-I subord Mari London-in is-interrog

Azt akarom, hogy Mari Londonba menjen. subjunct.
that want-I subord Mari London-to go.subj.3sg

In complement questions, it is optional to have SUBORD in each conjunct, but obligatory to have SUBORD in each disjunct

János megtudta, ...

John found.out

hogy mit csinálsz és (hogy) hol laksz.

SUBORD what you.do and SUBORD where you.live

hogy mit csinálsz vagy #(hogy) hol laksz.

SUBORD what you.do or SUBORD where you.live

Korean, subordinator ci

na-nun ... alayo

I-top ... know

- A-ka etiey sal-ko B-ka etiey sal-nun-ci
  A-nom where live-and B-nom where live-prs-subord
- # A-ka etiey sal-kena B-ka etiey sal-nun-ci
  A-nom where live-or B-nom where live-prs-subord
- A-ka etiey sal-nun-ci kuliko B-ka etiey sal-nun-ci

  and
- A-ka etiey sal-nun-ci hokun B-ka etiey sal-nun-ci

  or

Agenda

- We found that complement questions can be either directly or indirectly conjoined, but they can only be indirectly disjoined.
- What theories of questions and coordination predict this difference?
- Consider

Partition theory (Groenendijk & Stokhof 1984),

Inquisitive Semantics (Groenendijk & Roelofsen 2009, Ciardelli et al. 2012)

Question meanings
partition the set of worlds
(Groenendijk & Stokhof 1984 = G&S)

Semantically, a question demands a unique true and complete answer (although pragmatically, it accepts partial and mention-some answers).

[[Who sings?]]

= $\lambda w \lambda w'[\ \lambda x[sing'(w)(x)] = \lambda x[sing'(w')(x)]\ ]$

worlds where just Mary sings
words where just Bill sings
worlds where both M & B sing
worlds where no one sings

Partition semantics gets the conjunction of questions right

[[Who sings?]] $\cap$ [[Who dances?]] =

$\lambda w \lambda w'[\ \lambda x[\text{sing}'(w)(x)] = \lambda x[\text{sing}'(w')(x)]\ \wedge$
$\lambda x[\text{dance}'(w)(x)] = \lambda x[\text{dance}'(w')(x)]\ ]$

Moreover, the conjunction qualifies as a question. It has a unique true and complete answer:

Mary and Bill sing and Bill dances.

Hamblin and Karttunen don't get conjunction right.

$\{p: \exists x[p=\{w: \text{sing}'(w)(x)\}\} \cap \{p: \exists x[p=\{w: \text{dance}'(w)(x)\}\} =$
$\{p: \exists x[p=\{w: \text{sing}'(w)(x)\} \wedge p = \{w: \text{dance}'(w)(x)\}\} = \varnothing$

What does it say about disjunction?

[[Who sings?]] $\cup$ [[Who dances?]] =

$\lambda w \lambda w'$[λx[sing(w)(x)] = λx[sing(w′)(x)] $\vee$

λx[dance(w)(x)] = λx[dance(w′)(x)]]

But the disjunction does not qualify as a question.
It does not have a unique true and complete answer.
It offers a choice as to which question you answer:

Mary and Bill sing. *Bill dances.*

R is not transitive, so not an equivalence, doesn't partition W.

w1	w2	w3	
sing(m)	sing(m)	¬sing(m)	<w1,w2>∈R
¬dance(b)	dance(b)	dance(b)	<w2,w3>∈R
			<w1,w3>∉R

G&S: Lift before disjoining and thus distribute the embedding predicate over the complements

who_sings′ =lift=> λP[P(w*)(who_sings′)]

where P is the same type as I_know′, I_wonder′, Tell_me′, etc.

[[who sings or who dances]] =

λP[P(w*)(who_sings′)] ∪ λP[P(w*)(who_dances′)] =

λP[P(w*)(who_sings′) ∨ P(w*)(who_dances′)]

---

ans(w*)(p,Q) iff ∀w[p(w) →Q(w*)(w)]

ANS(w*)(p, who_sings_or_who_dances′) iff

ans(w*)(p, λw λw ′[λx[sing ′(w)(x)] = λx[sing ′(w′)(x)]]) or

ans(w*)(p, λw λw ′[λx[dance ′(w)(x)] = λx[dance ′(w′)(x)]])

On the right track!

The partition theory predicts a conjunction – disjunction contrast. A remaining wrinkle:

Main vs. complement (Szabolcsi 1997, Krifka 2001)

Who sings or who dances?	dubious
Who sings? Or, who dances?	change of mind
We found out who sings or who dances.	perfect
Who sings and who dances?	perfect
We found out who sings and who dances.	perfect

Lift complements only

Szabolcsi 1997

In G&S, lifting is unconstrained.

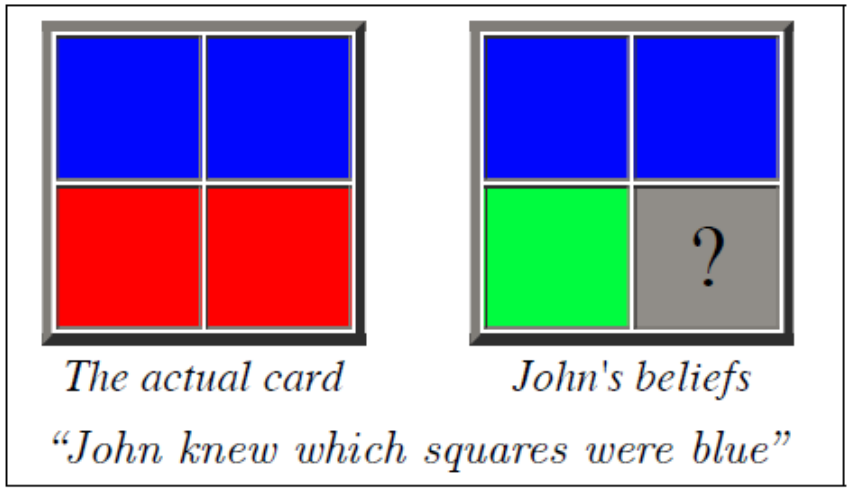
But, lifting A to λP[P(A)] is nothing but designating A to be an argument of some P. Not right for a main clause.

> "Lift complements only" has important consequences for pair-list readings, which exhibit large-scale contrasts between main and complement clauses. That was the focus of Szabolcsi 1997; not pertinent here.

From now on, only complement coordinations will be considered, because the data are much clearer there.

The good prediction for conjunction vs. disjunction came from partition semantics

But Heim 1994, Beck & Rullmann 1999, Mascarenhas 2009, Groenendijk & Roelofsen 2009, Klinedinst & Rothschild 2011, Spector & Egré 2014, Theiler 2014, ... argue against it. Some complements lack strongly exhaustive (SE) readings, others are ambiguous btw SE and weakly (WE) or intermediate exhaustive (IE) ones. E.g.



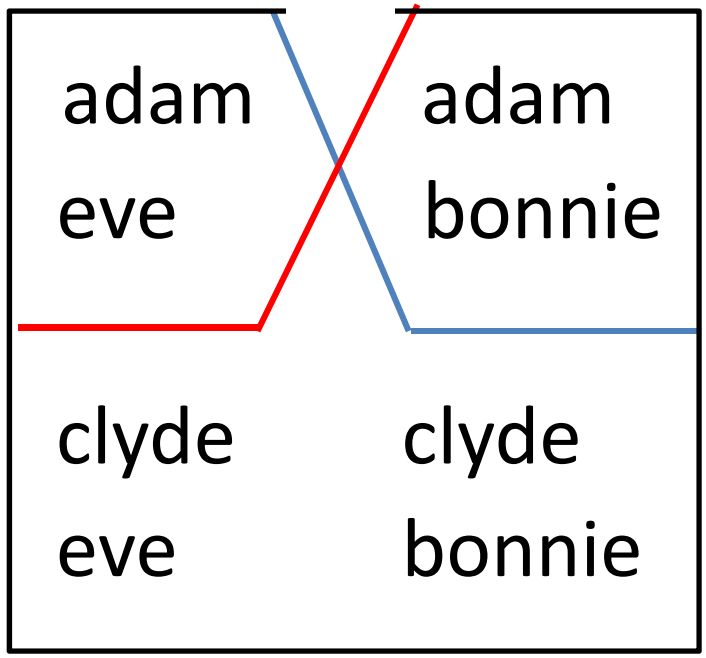
Cremers & Chemla 2014: false (SE) and true (WE/IE) judgments both significant

Inquisitive Semantics

https://sites.google.com/site/inquisitivesemantics/Home

In InqS, question meanings are not required to partition the set of worlds.

This affords an account of conditional questions:



If Adam is the father,
is Eve the mother /
who is the mother?

Could Inquisitive Semantics predict the conjunction-disjunction contrast?

Questions (and declaratives) are non-empty, downward closed sets of classical propositions.

adam	adam
eve	bonnie
clyde	clyde
eve	bonnie

Who is the mother?

$\wp\{w: m_w(e)\} \cup \wp\{w: m_w(b)\}$

$= \{\{ae, ce\}, \{ae\}, \{ce\}, \varnothing\} \cup$

$\{\{ab, cb\}, \{ab\}, \{cb\}, \varnothing\}$

Could Inquisitive Semantics predict the conjunction-disjunction contrast?

In InqS, questions (and declaratives) are non-empty, downward closed sets of classical propositions.

adam	adam
eve	bonnie

Who is the father?

$\wp\{w: f_w(a)\} \cup \wp\{w: f_w(c)\}$

clyde	clyde
eve	bonnie

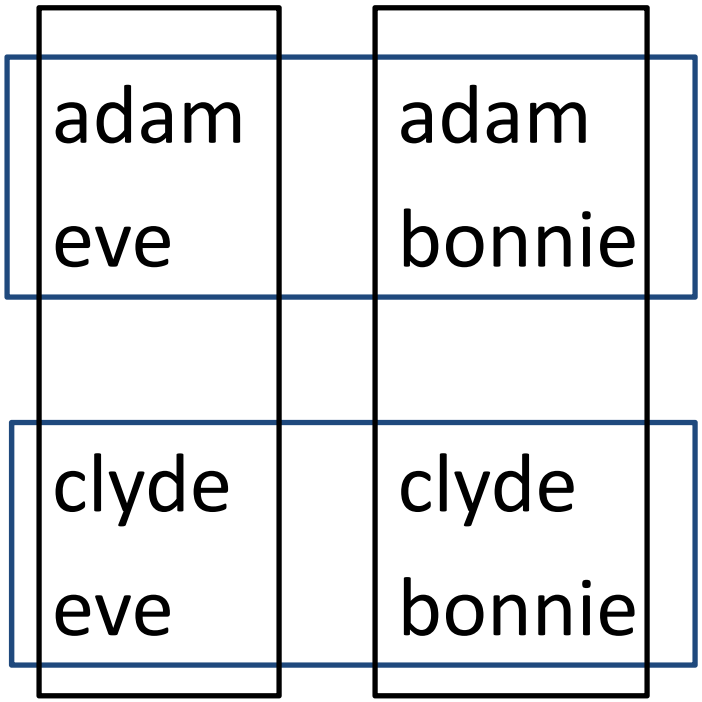
Q1 ∩ Q2

In InqS, questions (and declaratives) are non-empty, downward closed sets of classical propositions.

adam eve	adam bonnie	Who is the father? $\wp\{w: f_w(a)\} \cup \wp\{w: f_w(c)\}$
		∩
clyde eve	clyde bonnie	Who is the mother? $\wp\{w: m_w(e)\} \cup \wp\{w: m_w(b)\}$

Q1 ∪ Q2

Questions (and declaratives) are non-empty, downward closed sets of classical propositions.



Who is the father?

$\wp\{w: f_w(a)\} \cup \wp\{w: f_w(c)\}$

∪

Who is the mother?

$\wp\{w: m_w(e)\} \cup \wp\{w: m_w(b)\}$

Not there yet...

If the disjunction is simply the join, $\cup$ of the two questions, then it is predicted to be as good as the conjunction (meet, $\cap$). There is no necessity to lift-and-distribute in either case.

But Groenendijk & Roelofsen 2009, AnderBois 2012 make distinctions beyond plain algebraic ones:

A question is both inquisitive and non-informative.

- ϕ is inquisitive iff it contains more than one alternative.
- ϕ is non-informative iff its alternatives cover the set of worlds (do not exclude any possibility).

If OR flattened out the disjuncts,

then each disjunct would look like this:

adam	adam
eve	bonnie
clyde	clyde
eve	bonnie

Their ∪ would be the same.

Then Q1 OR Q2 would not qualify as a question.

Note that now OR =/= ∪,

just something defined in terms of ∪.

Does OR flatten out the disjuncts?

Roelofsen & Farkas 2014:

"Following Zimmermann (2000), Pruitt (2007), Biezma (2009), Biezma and Rawlins (2012), and Roelofsen (2013b), we will think of these types of sentences as *lists*. ... The only non-standard provision is that the non-inquisitive projection operator, !, is applied to every list item. The rationale for this is that every list item is to be seen, intuitively speaking, as one block, i.e., as contributing a single possibility to the proposition expressed by the list as a whole. This is ensured by applying !, which, roughly speaking, takes a set of possibilities and returns its union...

Rule for translating the body of a list:

[*item*$_1$ *or . . . or item*$_n$] $\approx>$ $!\varphi_1 \vee \ldots \vee !\varphi_n$."

Further potential support for flattening

- from Dynamic Semantics, where at least the baseline version of OR is internally and externally static, in distinction to AND:

  Mary has finished a book and/#or she has thrown it away.

  Mary got this from the NYT or a French paper.
  ?? She bought it at the airport.

- from sluicing as anaphora to issues (inquisitive propositions), AnderBois 2010:

  Bill saw Joe or {some girl / Mary or Sue},
  but we have no idea which #(girl / of M or S).

Both connections call for further investigation.

The need to lift is back ☺

In sum,

The conjunction—disjunction contrast does not fall out from the basic semantics of questions and disjunctions.

However, if theories impose constraints on what meanings qualify as question meanings (cf. partitional / inquisitive) and perhaps elaborate on what OR does, in addition to invoking ∪, then, luckily,

there is more than one way to predict the contrast.

Selected references

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