UBCs under embedding

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Upper-bounded construals of scalars: two views

(1) Some of the goats are sick.
$\rightsquigarrow \mathbf{Bel}_S\neg$(all the goats are sick)

- *Pragmatic view*
  This inference is due to a quantity implicature.
- *Conventionalist view*
  - This is not an inference at all.
  - Rather, *some* is read, in effect, as "some but not all".
  - The origin of this reading is either lexical or syntactic.

A problem with beliefs

(1) Julius believes that some of the goats are sick.

a. $\mathbf{Bel}_{\mathrm{S}}(\mathbf{Bel}_{\mathrm{J}}(\neg(\text{all the goats are sick})))$
b. $\mathbf{Bel}_{\mathrm{S}}(\neg\mathbf{Bel}_{\mathrm{J}}(\text{all the goats are sick}))$

- (1a) is an inference we would like to account for.
- (1b) is the best we can do on an orthodox Gricean account.

Problem explained

1. Could it be the case that, for all S knows, Julius believes that all the goats are sick, i.e. $\mathbf{Bel}_{\mathrm{S}}(\mathbf{Bel}_{\mathrm{J}}(\text{all the goats are sick}))$?
2. Presumably not, for then S should have said, "Julius believes that all the goats are sick." Hence, $\neg\mathbf{Bel}_{\mathrm{S}}(\mathbf{Bel}_{\mathrm{J}}(\text{all the goats are sick}))$.
3. Suppose that S is competent with respect to the proposition that $\mathbf{Bel}_{\mathrm{J}}(\text{all the goats are sick})$: $\mathbf{Bel}_{\mathrm{S}}(\mathbf{Bel}_{\mathrm{J}}(\text{all the goats are sick})) \vee \mathbf{Bel}_{\mathrm{S}}(\neg\mathbf{Bel}_{\mathrm{J}}(\text{all the goats are sick}))$.
4. If so, it follows that $\mathbf{Bel}_{\mathrm{S}}(\neg\mathbf{Bel}_{\mathrm{J}}(\text{all the goats are sick}))$.

Problem solved

4. $\mathbf{Bel}_{\mathrm{S}}(\neg\mathbf{Bel}_{\mathrm{J}}(\text{all the goats are sick}))$.
5. Suppose it is common ground that *Julius* is competent with respect to the proposition that all the goats are sick: $\mathbf{Bel}_{\mathrm{J}}(\text{all the goats are sick}) \vee \mathbf{Bel}_{\mathrm{J}}\neg(\text{all the goats are sick}))$.
6. Then it follows that $\mathbf{Bel}_{\mathrm{S}}(\mathbf{Bel}_{\mathrm{J}}\neg(\text{all the goats are sick}))$.

More problems with embedded scalars

(1) Fred ordered sashimi or some of the sushi.
$\rightsquigarrow$ Fred didn't order all the sushi.

(2) Fred knows that Betty got many of the answers right.
$\rightsquigarrow$ Betty didn't get all the answers right.

(3) At least one of the girls got most of the answers right.
$\rightsquigarrow$ At least one of the girls didn't get all the answers right.
$\not\rightsquigarrow$ None of the girls got all the answers right.

☺ These problems have been solved, too.

A fresh supply of problems (Chierchia et al., to appear)

(1) If you take salad OR dessert, you pay $20; but if you take BOTH there is a surcharge.

(2) Exactly three students did MOST of the exercises; the rest did them ALL.

(3) It is not just that you CAN write a reply. You MUST.

Pragmatic view:

- These are not quantity implicatures.
- Rather, (1)-(3) require truth-conditional narrowing of *or*, *most*, and *can*.
- These construals are *forced* by the context.

What is *not* at issue

- On the pragmatic view, there are two mechanisms that variously underwrite UBCs: quantity implicature and truth-conditional narrowing.
- However: *the conventionalist view agrees with this.*

(1) Barney stole some of the tarts.

a. $\mathbf{Bel}_S\neg$(Barney stole all the tarts) (strong)

b. $\neg\mathbf{Bel}_S$(Barney stole all the tarts) (weak)

What *is* at issue, then?

1. the nature of truth-conditional narrowing
2. the division of labour between truth-conditional narrowing and quantity implicature

Aside: the limits of conventionalist narrowing

(1) When Betty DRINKS, she DRINKS.

(2) Julius isn't RICH: he's RICH.

Truth-conditional narrowing vs. quantity implicature

1. *The pragmatic view*
   a. Quantity implicature is the normal case.
   b. Narrowing is a marked option in any context.
2. *The conventionalist view*
   a. Narrowing is always a freely available option, and therefore UBCs "occur systematically and freely in arbitrarily embedded positions." (Chierchia et al., to appear)
   b. This may hold even for downward-entailing and non-monotone contexts.

The critical difference is that between [1b] and [2a].

Systematically and freely?

(1) All the villagers have rabbits or chickens.

$\not\rightsquigarrow$ None of them have both.

(2) At least 10 of the villagers have rabbits or chickens.

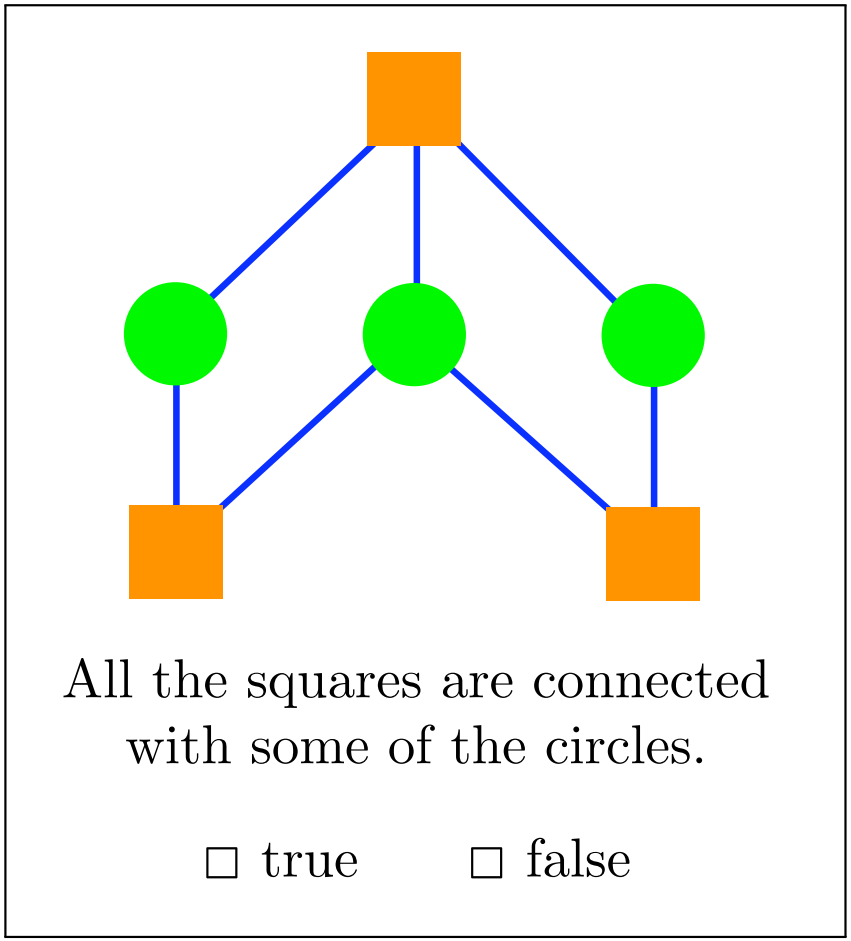
$\not\rightsquigarrow$ At least 10 of them don't have both.

(3) Only 6 of the villagers have rabbits or chickens.

$\not\rightsquigarrow$ Only 6 of the villagers have rabbits or chickens but not both.

Experimental evidence against conventionalism

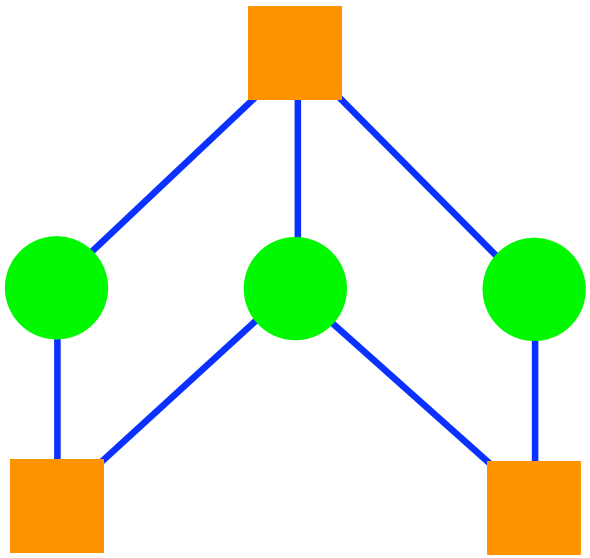
(Geurts & Pouscoulous 2009)



☞ No embedded UBCs.

Experimental evidence against conventionalism

(Geurts & Pouscoulous 2009)



All the squares are connected with some of the circles.

☐ true ☐ false ☐ could be either

☞ No embedded UBCs.

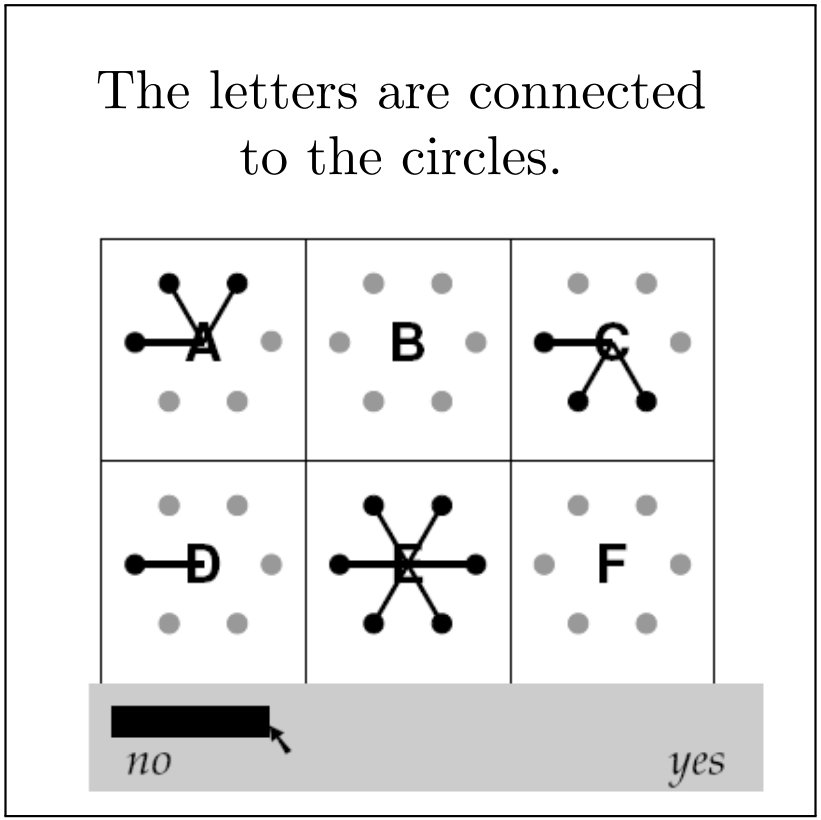
Charity to the rescue?

1. *Principle of Charity* (Wilson, Quine, Davidson)
   Try to interpret the speaker's utterance in such a way that it is true.
2. *Preference for Truth* (Chemla & Spector, Sauerland)
   If a sentence is ambiguous between two readings R_1 and R_2, where R_2 asymmetrically entails R_1, then naive subjects will only perceive reading R_1.

- [2] is not the same thing as [1].
- Unlike [1], [2] is not plausible at all.
- [2] is contradicted by a variety of data.

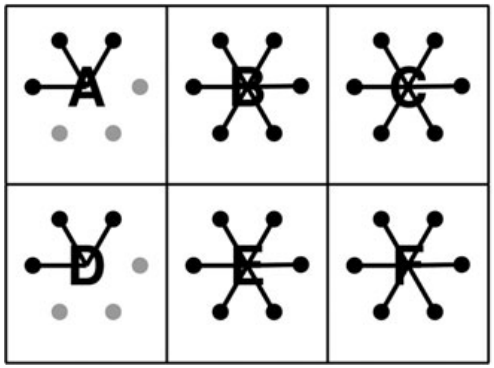
Experimental evidence for embedded UBCs?

(Chemla & Spector 2011)

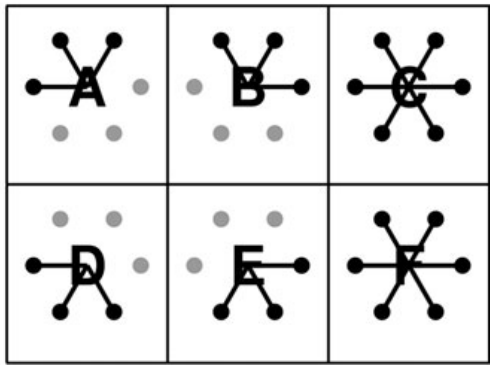


Materials

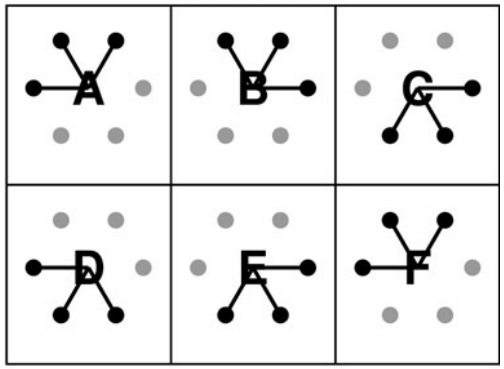
Target sentence: "Every letter is connected to some of its circles."



P5



P6



P7

	P5	P6	P7
No circles connected	0	0	0
All circles connected	4	2	0
Only some circles connected	2	4	6

Results and discussion

	P1	P2	P3	P4	P5	P6	P7
No circles connected	6	4	2	0	0	0	0
All circles connected	0	0	0	6	4	2	0
Only some circles connected	0	2	4	0	2	4	6
Mean rating	0	12	24	44	63	73	99

- C&S take the difference between P5/6 and P7 to show that embedded UBCs were derived some of the time.
- But where does this leave the rest of the data?
- *All* these data can be explained in terms of typicality.

Aside: An experimental artifact

- C&S's informants saw every picture up to four times.
- No fillers were used.
- These two features could have invited comparisons between items.
- In particular, it could be that P7-items depressed the ratings of subsequent P5/6-items.

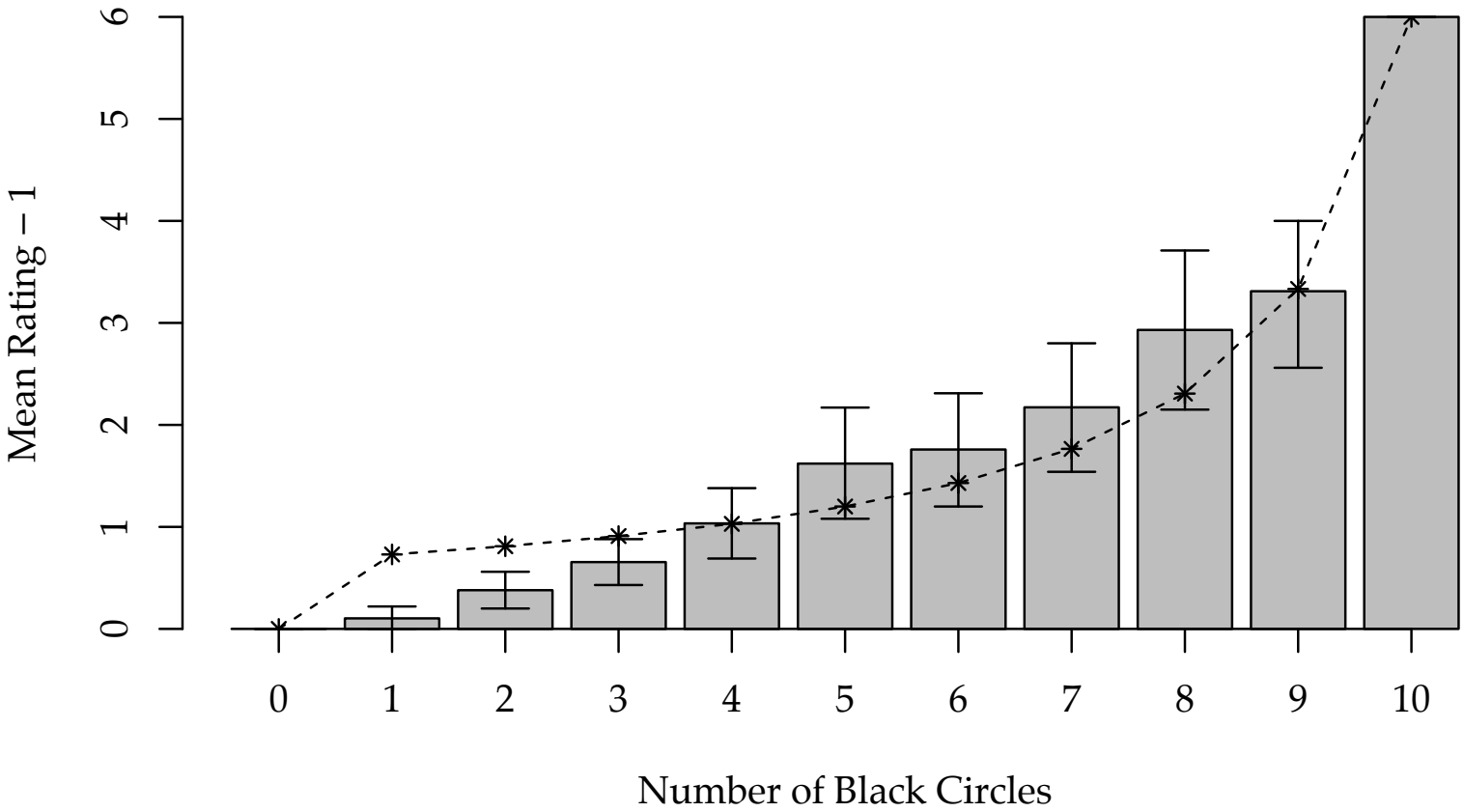
Aside: An experimental artifact

	P5	P6
Trials in C&S's experiment following P7	63	73
Trials in C&S's experiment preceding P7	78	96
Minimalist replication	93	100

- These findings confirm that the difference between P5/6 and P7 is an artifact of C&S's experimental design.
- This kills C&S's argument in favour of a conventionalist approach to UBCs.
- However, C&S's data are still interesting in their own right, and call for an explanation.

Typicality effects with *all*

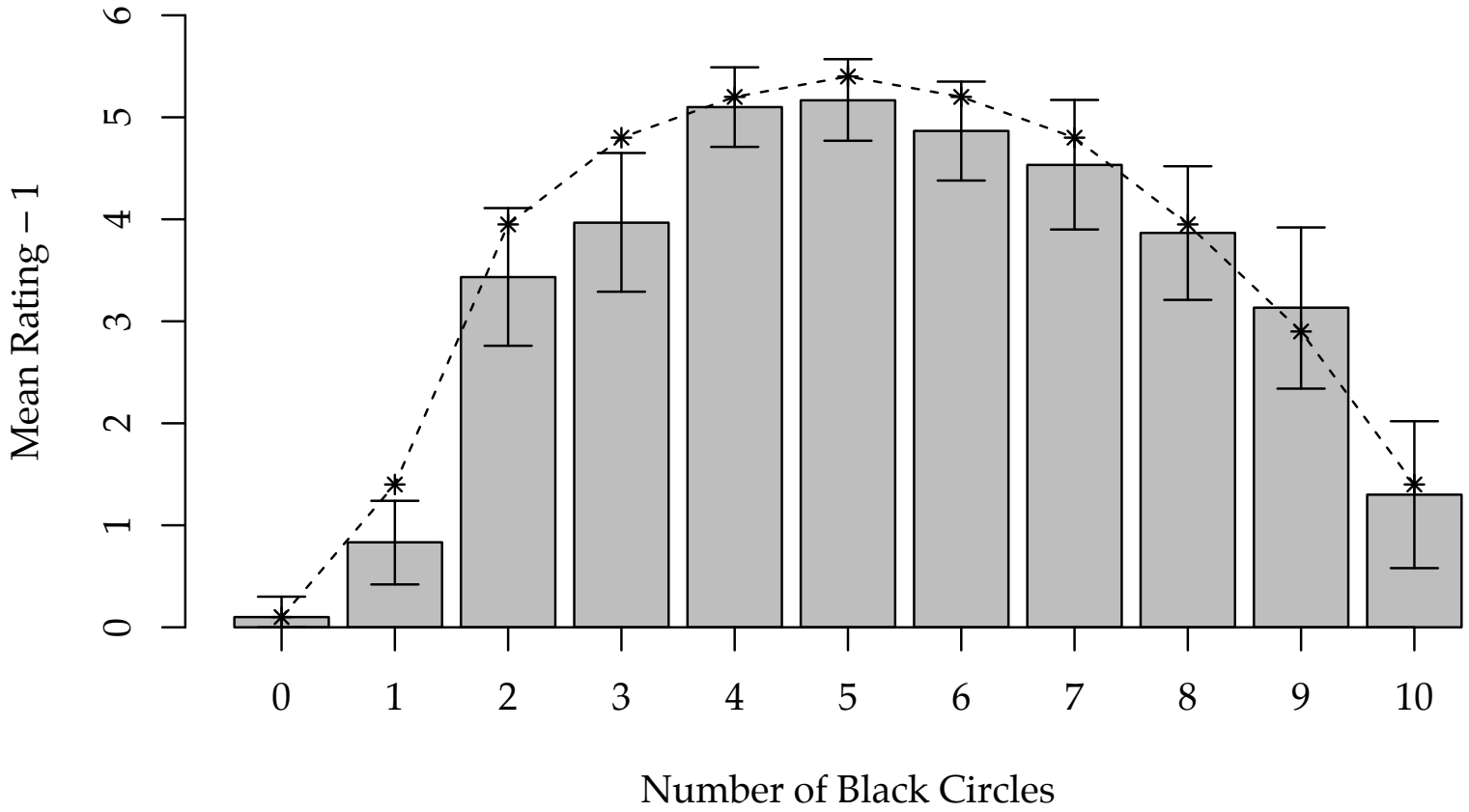
All the circles are black.



$$\rho_{\text{EVERY A B}}(S) = \frac{n}{\Sigma \rho_B(a_i)^{-1}}$$

Typicality effects with *some*

Some of the circles are black.



$\rho_{\text{SOME A B}}(S) = 1 - dist(S - P)^2$

Chemla & Spector's data explained

	P1	P2	P3	P4	P5	P6	P7
No circles connected	6	4	2	0	0	0	0
All circles connected	0	0	0	6	4	2	0
Only some circles connected	0	2	4	0	2	4	6
Mean rating	0	12	24	44	63	73	99

(1) Every letter is connected with some of its circles.

- Our analysis of ρ_{SOME} entails that:

  $\rho_B(\text{only some circles connected})$
  $> \rho_B(\text{all circles connected})$
  $> \rho_B(\text{no circle connected})$

- When combined with our analysis of ρ_{EVERY}, this yields a near-perfect fit with C&S's data ($r = .99, p < .001$).

Conclusions and reflections

- C&S's data offer no support for the claim that UBCs occur "systematically and freely" in embedded positions.
- We have learned an important methodological lesson:

  What looks like a UBC doesn't have to be one.

- We have to distinguish:
  - conversational implicatures (e.g. quantity implicatures)
  - truth-conditional content (e.g. narrowing)
  - typicality effects
- Conceptually, these notions seem to be clearly distinct, but empirically, things aren't perhaps so clear. E.g.,

  (1) Fred has a wonderful secretary.

UBCs in non-monotone contexts?

(1) There was only one key that fit some of the locks.

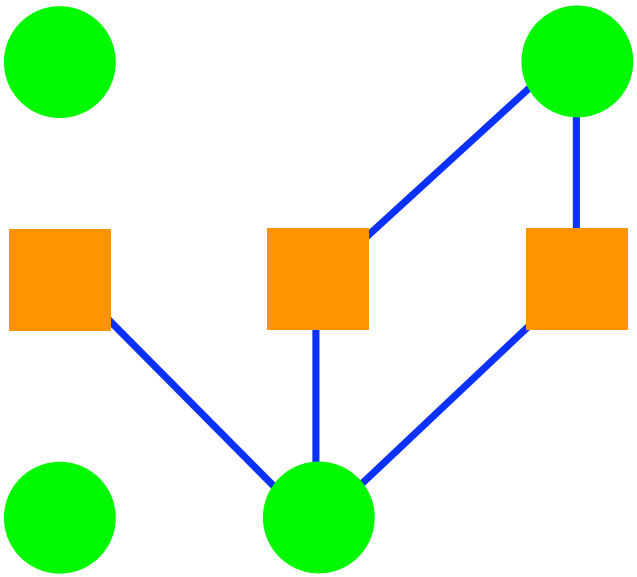
(2) There was only one key that fit some but not all of the locks.

≡ One key fit some but not all of the locks, and all the others fit either none or all of the locks.

(3) There was only one key that fit SOME of the locks.

Experimental evidence against (Geurts & Pouscoulous 2009)

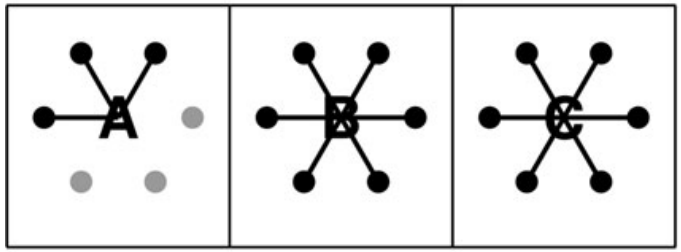
There are exactly two circles that are connected with some of the squares.



☞ No evidence for embedded UBCs.

Experimental evidence in favour (Chemla & Spector 2011)

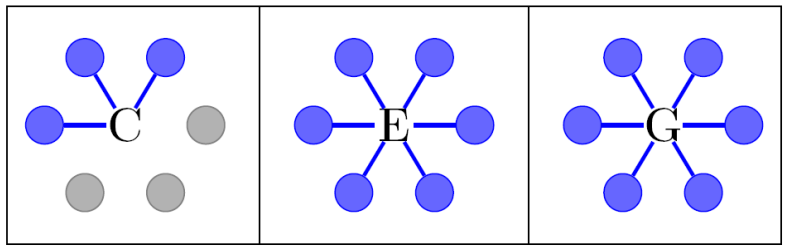
(1) There is exactly one letter connected with some of its circles.



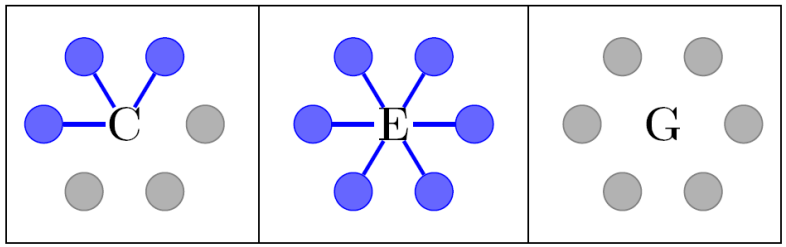
- With this picture, (1) received a rating of 73%, which leads C&S to suggest that there may be a *general* preference for deriving UBCs.
- Alternative explanation: this result is due to a *visual contrast* within the picture.

Experimental evidence for the alternative explanation

(1) Exactly one letter is connected to some of its circles.



(HiCon)



(LoCon)

Results and discussion

	HiCon-list	LoCon-list
False	32	30
HiCon	64	–
LoCon	–	37

- These data confirm our hypothesis.
- Besides, if Chemla & Spector's view was correct, how could Geurts & Pouscoulous's data be accounted for?
- Again, Chemla & Spector's data offer no support for the claim that UBCs occur "systematically and freely" in embedded positions.

References

- Bart Geurts and Bob van Tiel: Scalar expressions under embedding. To appear in *Semantics and pragmatics*.
- Bob van Tiel: Embedded scalars and typicality. To appear in the *Journal of semantics*.