



Using embedded quantifiers

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SFB 673 – Alignment in Communication

Why embedded quantifiers?

- Contested theoretical issue
 - Gricean vs. localist vs. ...
- Contested experimental methods/materials
- Emphasis on interpretation
 - Truth-value judgments
 - Acceptability (?) judgments
- Here, aim to shift focus to usage
 - Relating this to interpretation via prototypicality etc.

Embedded 'implicatures'?

(1) All of the students read some of the papers.

+> All of the students read not-all of the papers??

- How is *some* interpreted here? c.f.

(2) Some of the students read all of the papers.

+> Not all of the students read all of the papers.

(3) All of the students read all of the papers.

Derivation?

(1) All of the students read some of the papers.

+> All of the students read not-all of the papers??

But negation of

(3) All of the students read all of the papers.

only gives

+> It is not the case that all of the students read all of the papers

which is weaker than the claimed reading

- Problem for post-propositional pragmatic account

Embedded ‘implicatures’?

- Point of terminology (Geurts):
 - **Implicatures** by definition post-propositional
 - So “embedded implicatures” contradiction in terms
 - Let’s call them “**local upper-bound construals**” (UBCs)

Embedded UBCs, then?

Chierchia et al. (?2008): UBCs “occur systematically and freely in arbitrary embedded positions”

Geurts and Pouscoulous (2009) query this

- Exp. 1: Inference judgments
- (4) Betty thinks that Fred heard some of the Verdi operas.
Would you infer from this that Betty thinks Fred didn't hear all of the Verdi operas?

Embedded UBCs, then?

Condition	Bare	Wants	Thinks	Must	All
% UBC (v1)	93	N/A	50	3	27
% UBC (v2)	94	32	65	N/A	N/A

- Exp. 1: Inference judgments

(4) Betty thinks that Fred heard some of the Verdi operas.
Would you infer from this that Betty thinks Fred didn't hear all of the Verdi operas?

Problem:

Chierchia et al. (?2008): UBCs “occur systematically and freely in arbitrary embedded positions”

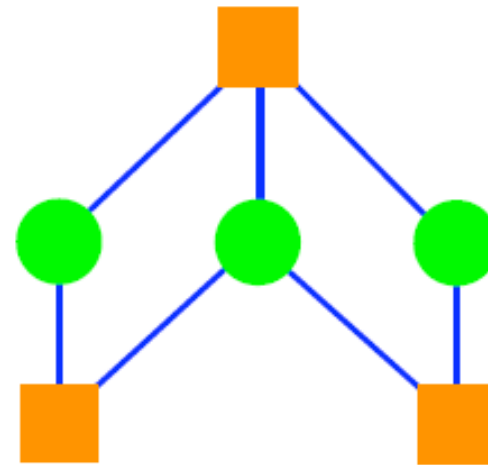
- Apparently not
- Casts doubt on default/localist approaches

Griceans: UBCs shouldn't be available

- But they sometimes are
- G&P argue UBCs here are either
 - Experimental artefacts
 - or arising from auxiliary assumptions
 - But the result for “all” is still surprising

Verification of non-UBC 'some'

- G&P: participants will endorse embedded 'some' even when the UBC is false
 - Experiment 3
 - Verified consistently
 - (Inferences vary)

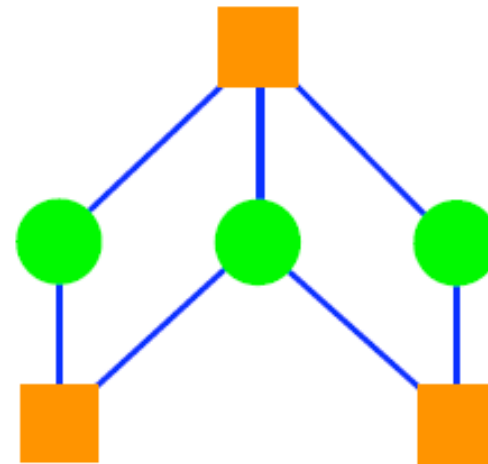


All the squares are connected with some of the circles.

true false

Objections to this approach

- Chemla and Spector (2011)
 - (Considering also a third position: global with free alternatives)
 - G&P participants responding to non-UBC reading: but UBC reading may still be available
 - Relevance of stronger reading debatable
 - Stronger reading hard to verify(?)
 - Principle of Charity...



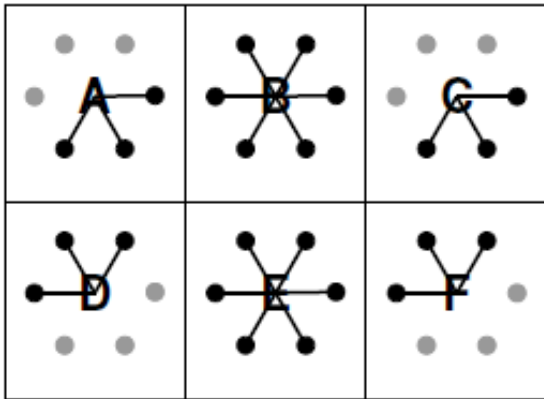
All the squares are connected
with some of the circles.

true false

An alternative

- Chemla and Spector (2011)

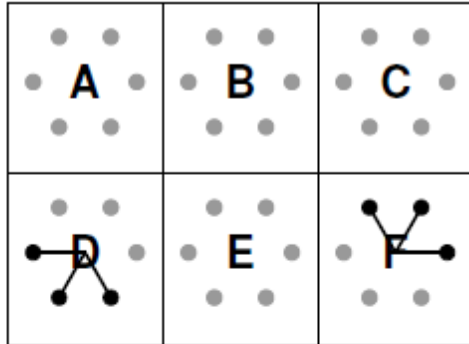
Every letter is connected with some of its circles.



- Simpler and more readable (C&S, introspection...)
- Use of letters (and 'each') makes local reading more relevant
- Graded judgments of truth

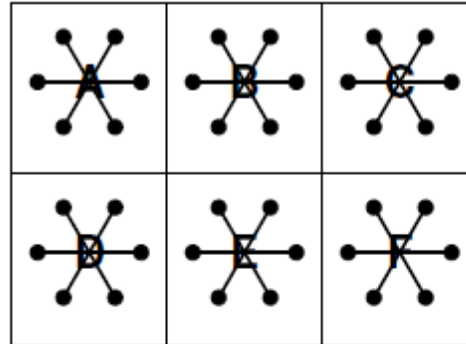
Results from C&S

FALSE



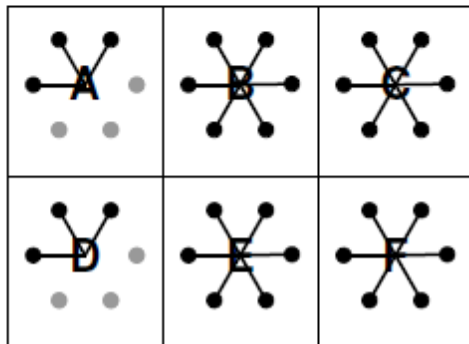
Lit = F / Glob = F / Loc = F

LITERAL



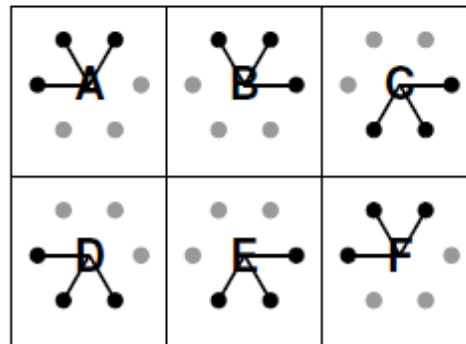
Lit = T / Glob = F / Loc = F

WEAK

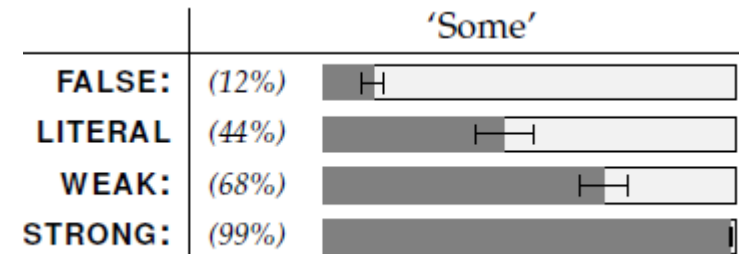


Lit = T / Glob = T / Loc = F

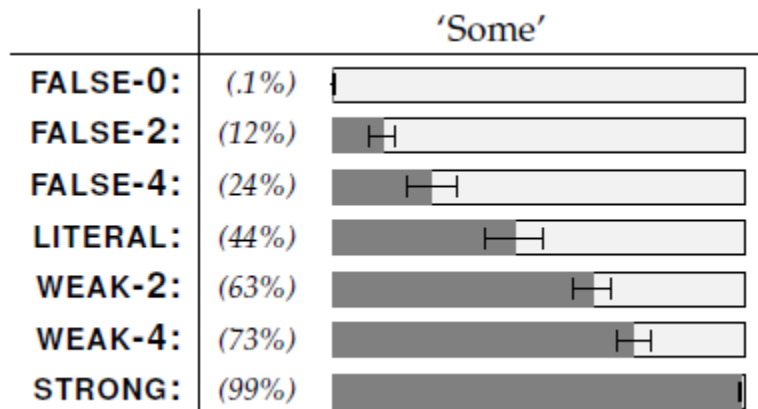
STRONG



Lit = T / Glob = T / Loc = T



Evidence for what exactly?



- Clear indication of typicality effects
- Even so: “the best instances of the sentence are those which make the local reading true...it is hard to see how this could be so if the local reading did not correspond to a salient reading of the sentence” (p.23)
- (Not clear that this is what we mean by an upper-bound construal)

Geurts and van Tiel's interpretation

- Experimental design of C&S no better
- Principle of Charity doesn't seem to apply in unembedded cases
- Instructions verbose, and confused truth and appropriateness
- Results explicable in terms of contrast effects
 - Post hoc analysis by item (following/preceding 'strong' condition)
 - Then new partial replication

	Weak-2	Weak-4
Following 'strong'	63	73
Preceding 'strong'	78	96
In G&vT experiment	93	100

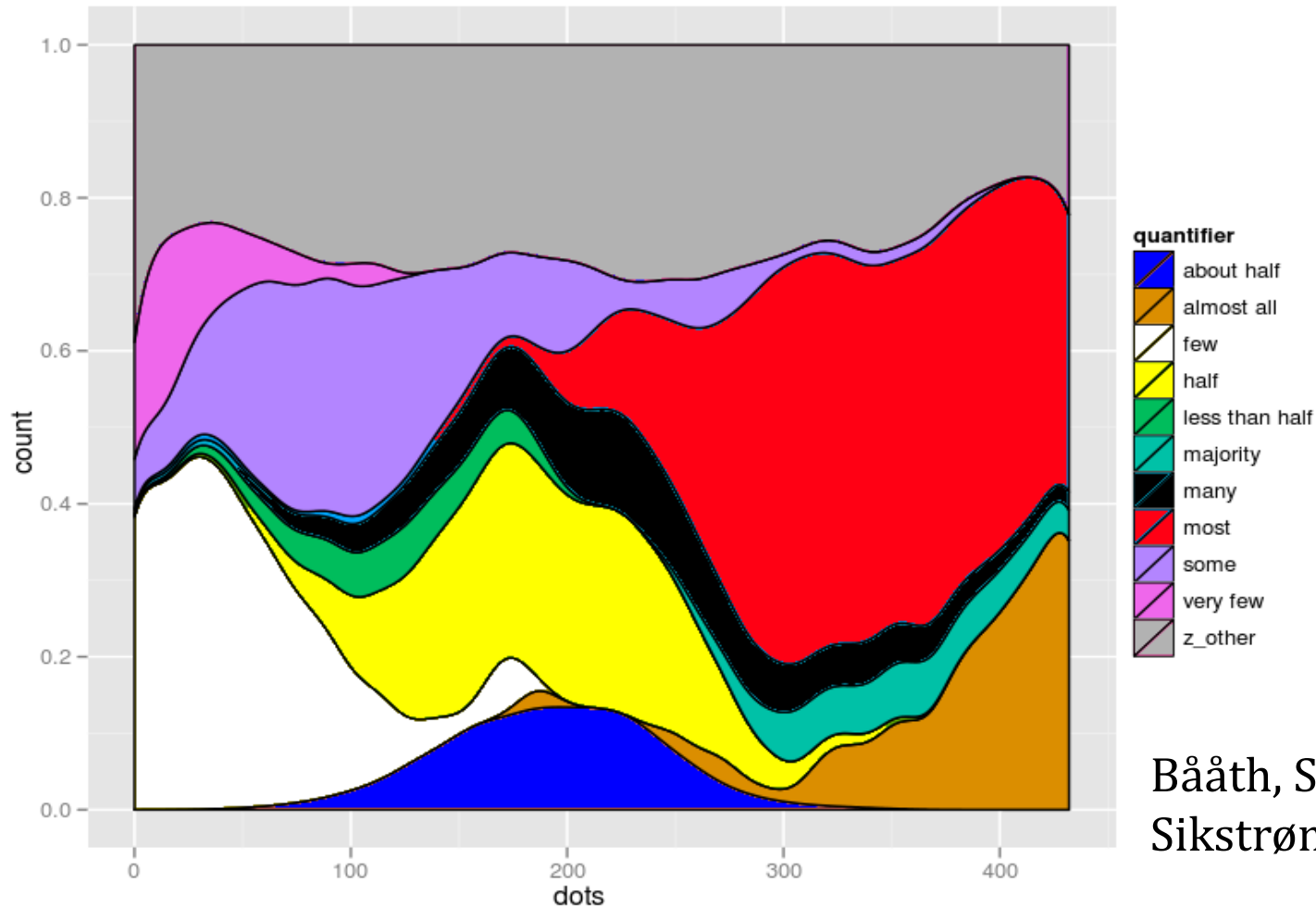
Nature of typicality effects?

- Assume that “some” refers naturally to a proper subset, not near 0% or 100%
- Can devise a metric for the appropriateness of the “all...some” displays based on the assumptions that
 - “some” is more appropriate in mid-range than in “all” condition
 - but it is also more appropriate in the “all” condition than in “none” condition
- Resulting metric provides good fit to C&S data (van Tiel)
 - Arguably, therefore, a better account than the local UBC one

Why have typicality effects?

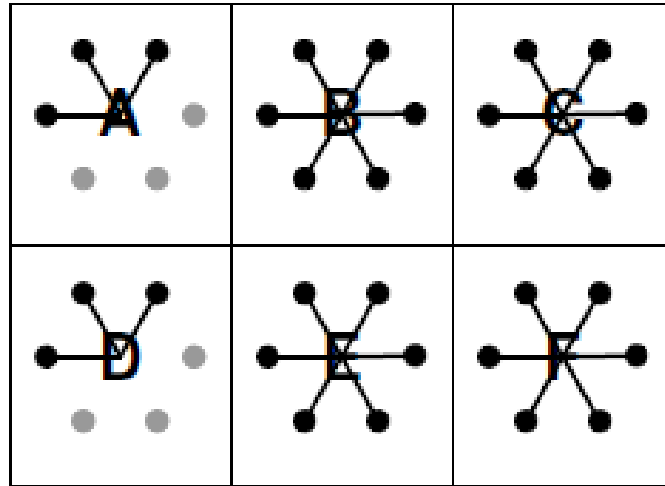
- Hearers generally good at recapturing meaning intended by speaker
- e.g. SIs automatically not drawn when
 - Speaker knowledge incomplete
 - Stronger statement irrelevant
 - Stronger statement impolite, etc.
- Typical interpretation should be related to how speakers choose to encode specific states-of-affairs
- Softer inferences than classical implicatures...

Expression usage in one dimension



Bååth, Sauerland, and
Sikstrøm (in preparation)

Expression usage in two dimensions



“Each of the letters is connected to some of its circles”

“Some of the letters are connected to all of their circles”

“Not all of the letters are connected to all of their circles”

“A and D are only connected to half of their circles”...

Elicitation materials

In an exam, the students scored as follows:

	Q1	Q2	Q3	Q4	Q5	Q6	Q7	Q8	Q9	Q10
Student 1	✓	✓	✓	✓	✓	✓	✓	✓	✗	✗
Student 2	✓	✓	✓	✓	✓	✓	✓	✓	✗	✗
Student 3	✓	✓	✓	✓	✓	✓	✓	✓	✗	✗
Student 4	✓	✓	✓	✓	✓	✓	✓	✗	✗	✗
Student 5	✓	✓	✓	✓	✓	✓	✓	✗	✗	✗
Student 6	✓	✓	✓	✓	✓	✓	✗	✗	✗	✗
Student 7	✓	✓	✓	✓	✓	✓	✗	✗	✗	✗
Student 8	✓	✓	✗	✗	✗	✗	✗	✗	✗	✗
Student 9	✗	✗	✗	✗	✗	✗	✗	✗	✗	✗
Student 10	✗	✗	✗	✗	✗	✗	✗	✗	✗	✗

- Piloted on Amazon MTurk
- 25 participants per condition
- Fielded on separate days
 - Minimal overlap
 - Minimal contrast effects

If you had to summarize these results in one sentence, using words rather than numbers (e.g. 'none', 'some', 'half', 'many', 'most', 'all', ...), what would you say? Fill in the gaps.

of the students got of the questions right.

Preliminary results

In an exam, the students scored as follows:

	Q1	Q2	Q3	Q4	Q5	Q6	Q7	Q8	Q9	Q10
Student 1	✓	✓	✓	✓	✓	✓	✓	✓	✗	✗
Student 2	✓	✓	✓	✓	✓	✓	✓	✓	✗	✗
Student 3	✓	✓	✓	✓	✓	✓	✓	✓	✗	✗
Student 4	✓	✓	✓	✓	✓	✓	✓	✗	✗	✗
Student 5	✓	✓	✓	✓	✓	✓	✓	✗	✗	✗
Student 6	✓	✓	✓	✓	✓	✓	✗	✗	✗	✗
Student 7	✓	✓	✓	✓	✓	✓	✗	✗	✗	✗
Student 8	✓	✓	✗	✗	✗	✗	✗	✗	✗	✗
Student 9	✗	✗	✗	✗	✗	✗	✗	✗	✗	✗
Student 10	✗	✗	✗	✗	✗	✗	✗	✗	✗	✗

- 11 distinct responses in 25!
 - None/all – 5
 - Most/half – 4
 - Most/some – 3
- “None”, “some”, “half”, “many”, “most” all elicited in both positions

If you had to summarize these results in one sentence, using words rather than numbers (e.g. 'none', 'some', 'half', 'many', 'most', 'all', ...), what would you say? Fill in the gaps.

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Student 3	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
Student 4	✓	✓	✓	✓	✓	✓	✓	✗	✗	✗
Student 5	✓	✓	✓	✓	✓	✓	✓	✗	✗	✗
Student 6	✓	✓	✓	✓	✓	✓	✗	✗	✗	✗
Student 7	✓	✓	✓	✓	✓	✓	✗	✗	✗	✗
Student 8	✓	✓	✗	✗	✗	✗	✗	✗	✗	✗
Student 9	✗	✗	✗	✗	✗	✗	✗	✗	✗	✗
Student 10	✗	✗	✗	✗	✗	✗	✗	✗	✗	✗

- Version 2: 9 distinct responses
 - Most/half – 4
 - Most/many – 4

Preliminary results

	Q1	Q2	Q3	Q4	Q5	Q6	Q7	Q8	Q9	Q10
Student 1	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
Student 2	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
Student 3	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
Student 4	✓	✓	✓	✓	✓	✓	✓	✗	✗	✗
Student 5	✓	✓	✓	✓	✓	✓	✓	✗	✗	✗
Student 6	✓	✓	✓	✓	✓	✓	✗	✗	✗	✗
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Student 8	✗	✗	✗	✗	✗	✗	✗	✗	✗	✗
Student 9	✗	✗	✗	✗	✗	✗	✗	✗	✗	✗
Student 10	✗	✗	✗	✗	✗	✗	✗	✗	✗	✗

- Version 3: 14 distinct responses
 - Some/all – 4
- Extensive overlap in “domains of application”
- Possible justification for prototype effect
 - Distinct from SI per se

Revised question

In an exam, the students scored as follows:

	Q1	Q2	Q3	Q4	Q5	Q6	Q7	Q8	Q9	Q10
Student 1	✓	✓	✓	✓	✓	✓	✓	✓	✗	✗
Student 2	✓	✓	✓	✓	✓	✓	✓	✓	✗	✗
Student 3	✓	✓	✓	✓	✓	✓	✓	✓	✗	✗
Student 4	✓	✓	✓	✓	✓	✓	✓	✗	✗	✗
Student 5	✓	✓	✓	✓	✓	✓	✓	✗	✗	✗
Student 6	✓	✓	✓	✓	✓	✓	✗	✗	✗	✗
Student 7	✓	✓	✓	✓	✗	✗	✗	✗	✗	✗
Student 8	✓	✓	✓	✓	✗	✗	✗	✗	✗	✗
Student 9	✓	✓	✓	✗	✗	✗	✗	✗	✗	✗
Student 10	✓	✓	✓	✗	✗	✗	✗	✗	✗	✗

- Instructions adjusted to mention fewer possibilities
- First condition – all of the students got some-but-not-all of the questions right
- Responses:
 - Some/most (7)
 - None/all (5)

If you had to summarize these results in one sentence, using words rather than numbers (e.g. 'none', 'some', 'most', 'all'), what would you say? Fill in the gaps.

of the students got of the questions right.

Revised question

In an exam, the students scored as follows:

	Q1	Q2	Q3	Q4	Q5	Q6	Q7	Q8	Q9	Q10
Student 1	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
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Student 6	✓	✓	✓	✓	✓	✓	✗	✗	✗	✗
Student 7	✓	✓	✓	✓	✗	✗	✗	✗	✗	✗
Student 8	✓	✓	✓	✓	✗	✗	✗	✗	✗	✗
Student 9	✓	✓	✓	✗	✗	✗	✗	✗	✗	✗
Student 10	✓	✓	✓	✗	✗	✗	✗	✗	✗	✗

- Instructions adjusted to mention fewer possibilities
- Second condition – falsifies the UBC of embedded *some*
- Responses:
 - Some/all (8)
 - Three, few, a few/all (3)

If you had to summarize these results in one sentence, using words rather than numbers (e.g. 'none', 'some', 'most', 'all'), what would you say? Fill in the gaps.

of the students got of the questions right.

Revised question

In an exam, the students scored as follows:

	Q1	Q2	Q3	Q4	Q5	Q6	Q7	Q8	Q9	Q10
Student 1	✓	✓	✓	✓	✓	✓	✓	✗	✗	✗
Student 2	✓	✓	✓	✓	✓	✓	✓	✗	✗	✗
Student 3	✓	✓	✓	✓	✓	✓	✗	✗	✗	✗
Student 4	✓	✓	✓	✓	✓	✗	✗	✗	✗	✗
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Student 6	✓	✓	✓	✓	✗	✗	✗	✗	✗	✗
Student 7	✓	✓	✓	✓	✗	✗	✗	✗	✗	✗
Student 8	✓	✓	✓	✓	✗	✗	✗	✗	✗	✗
Student 9	✓	✓	✓	✗	✗	✗	✗	✗	✗	✗
Student 10	✓	✓	✓	✗	✗	✗	✗	✗	✗	✗

- Instructions adjusted to mention fewer possibilities
- Third condition – like first condition, but fewer correct
- Responses:
 - All/some (7) (!)
 - None/all (5)

If you had to summarize these results in one sentence, using words rather than numbers (e.g. 'none', 'some', 'most', 'all'), what would you say? Fill in the gaps.

of the students got of the questions right.

Tentative conclusions

- “All...some” not attested in condition that falsifies the UBC of *some*
- Not surprising:
 - If the UBC is available locally, “all...some” would be false
 - If there are prototype effects, “all...some” would be inappropriate
- In this condition, people tend to talk instead about only a subset of the population under discussion
 - Note that this is a response to the same question
 - This is still explicable from either point of view
 - UBC: preferred statement is blocked by its falsity
 - Prototype: “some...all” happens to be the ‘nearest’ expression for this case
 - Which comes first? Blocking or attraction?

Tentative conclusions

- In middle condition, “all...some” has already disappeared
 - Supplanted by “some...most”
 - Again, condition disposes participants to talk about subset
 - Doesn't seem to be motivated by UBC
 - unless the UBC is the stronger “some” +> “not most” construal
 - Possible evidence in favour of prototype view?
- To back up this claim, need to show that the ‘prototypical’ scenario for “all...some” really *is* the third condition

Summary

- UBCs for embedded weak quantifiers:
 - can ostensibly be ignored in verification (unlike SIs)
 - appear to match interpretative preferences
- Could arise from embedded weak quantifiers appearing only when global alternatives are unavailable
- Studying when such expressions are preferred in usage might indicate how they should be rationally interpreted
 - If so, this has implications for the nature of pragmatic enrichment processes
 - If not, hearers are essentially irrational, which is interesting (and potentially easier to formalise)