Why Symmetry is not a Problem for a Gricean Theory of Scalar Implicature

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The Plan

- I'm going to talk about an issue about scalar implicature (SI) which has been dubbed the "symmetry problem".
- Why does
  - *I like some kinds of fish*
- implicate
  - *I don't like all kinds of fish*
- rather than
  - *I don't like some but not all kinds of fish*?
- This is taken as a serious problem for Gricean theories of implicature by Fox, Chierchia, Katzir, E. Block, and others.

The Plan

- I'll suggest that Gricean reasoning resolves this problem via the interaction of the maxims of Quantity and Manner.
- The observed SIs are all examples in which only one maxim is relevant to the choice between forms;
- The unwanted "symmetric" SIs are all examples in which two maxims are crucially in competition.
- I'll show that standard Gricean reasoning already predicts that the inference does not arise in normal cases.
    - But this means giving up on a popular way of thinking about SI among neo-Griceans.

Outline

- Scalar Implicature

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- Grice's Theory of (Scalar) Implicature

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Scalar Implicature

- **Scalar** implicatures are those which commonly affect utterances containing items that fall on a scale, e.g. *warm* or *good*.
- *It is warm today*:
  - In the right context, a hearer might infer "It is not hot today".
- *He is a good candidate*:
  - $\rightsquigarrow$ "He is not an excellent candidate".
- However, both of these inferences may fail to arise in some contexts.

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Grice on Cooperation and Communication

- According to Grice, implicatures are associated with (violations of) the Cooperative Principle:

Cooperative Principle

Make your contribution such as is required, at the stage at which it occurs, by the accepted purpose or direction of the talk exchange in which you are engaged.

Grice's Theory of (Scalar) Implicature

- The Cooperative Principle can be divided into (among others) these four types of principles:

Conversational Principles

Quantity:
1. Make your contribution as informative as is required (for the current purposes of the exchange).
2. Do not make your contribution more informative than is required.

Quality:
1. Do not say what you believe to be false.
2. Do not say that for which you lack adequate evidence.

Relation:
Be relevant.

Manner:
Be perspicuous. (3. Be brief (avoid unnecessary prolixity).)

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Grice on Language Use as Rational Action

- Why follow these principles?
- The principles are not phrased as they are because people always do follow them, but because it's reasonable to follow them.
- Grice(1989:28):
  "[O]ne of my avowed aims is to see talking as a special case or variety of purposive, indeed rational behavior ...
- Grice (1989:29):
  "Anyone who cares about the goals that are central to conversation/communication ... must be expected to have an interest, given suitable circumstances, in participating in talk exchanges that will be profitable only on the assumption that they are conducted in general accordance with the Cooperative principle and its maxims."

Quantity Implicatures

- Griceans interpret SIs as a special case of Quantity (1) implicatures.
- *It is warm today* is semantically compatible with *It is hot today*:
  - *It is hot* asymmetrically entails *It is warm*.
- When a speaker uses *It is warm today* to implicate "It is not hot today", this is effective because (roughly)
  - Speaker and hearer both know that, if the speaker could have said *It is hot today* without violating the Cooperative Principle, he would have;
  - Speaker can expect hearer to recognize, in his decision to say *It is warm today* rather than the more informative *It is hot today*, an intention to convey that it is warm, but not hot (else he would have said *It is hot*!).

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- Scalar Implicature
- Grice's Theory of (Scalar) Implicature
- The Symmetry Problem and Katzir's Proposal
  - Two orthogonal questions: local vs. global, source of alternatives
  - The symmetry problem
  - Katzir's approach
  - Why Katzir's approach is not (really) Gricean
- A Gricean Alternative
- Comparison
- Conclusion

Local vs. Global, Source of Alternatives

- Neo-Gricean theories of SI are generally *globalist*: roughly, computing SIs involves inferring the negation of more informative alternatives.
- This feature of the Gricean theory has been challenged recently by Landman, Chierchia, Fox, Spector, and others, who argue for a localist theory.
  - They propose a theory in which there is a grammatical mechanism for computing SIs.
  - However, they do not address the question of where the alternatives come from.
- Katzir (2007) has argued for a grammatical mechanism for computing the alternative set that enters into the computation of SIs.
  - This also involves a partial grammaticization of SIs.
  - But it is independent of the Landman/Chierchia/Fox approach.

Desperately Seeking Symmetry

- Katzir's argument is directed against a quasi-Gricean algorithm for computing scalar implicatures:

SI1. Do not assert ϕ if there is another sentence ϕ' such that

a. ϕ' asymmetrically entails ϕ, and
b. ϕ' is (believed to be) true, relevant, and supported by the evidence.

- Suppose you don't know what kind of fish I like. I say: *I like some kinds of fish* (ϕ).
  - If it were true that I like all kinds of fish, I couldn't say this while complying with (SI1), since there would be a stronger, true, relevant alternative $\phi' =$ *I like all kinds of fish*.
  - So you conclude that I like some (ϕ) but not all ($\neg\phi'$).

Desperately Seeking Symmetry

SI1. Do not assert ϕ if there is another sentence ϕ' such that

a. ϕ' asymmetrically entails ϕ, and
b. ϕ' is (believed to be) true, relevant, and supported by the evidence.

- But wait. Suppose again you don't know what kind of fish I like. I say: *I like some kinds of fish* (ϕ).
  - I could also have used the stronger $\phi'' =$ *I like some but not all kinds of fish.*
  - So, by the same reasoning, you should infer $\neg\phi''$ – it's not true that I like some but not all of them.
- But here, $\phi \wedge \neg\phi'' =$ *I like some kinds, and I don't like some but not all kinds.*
- This is equivalent to "I like all kinds of fish" – not the desired implicature.
- This is the symmetry problem.

Horn scales

- Katzir assumes that the only response available to the Gricean is to rely on Horn scales – e.g., <some, most, all>.
  - The idea is, *some* can't compete with *some but not all* because they don't occur on the same scale.
- On this approach, (SI1) becomes (SI2), where $Alt(\phi)$ is the set of sentences just like ϕ except that scalar items are replaced by other items in the same scale.

(SI2). Do not assert ϕ if there is another sentence ϕ' such that

a. $\phi' \epsilon Alt(\phi)$, and
b. ϕ' asymmetrically entails ϕ, and
c. ϕ' is (believed to be) true, relevant, and supported by the evidence.

Horn scales

- Katzir – like many before him – thinks of Horn scales as stipulations about what items compete with each other.
- His strategy is to show that there are scalar implicatures that obviously don't fall on scales, and to propose an alternate account which captures them and avoids symmetry.

Katzir's Theory

- Katzir's idea is to postulate a rule for deriving alternatives syntactically from the uttered sentence.
- $Alt(\phi)$ = The set containing all ϕ' such that ϕ' is a parse tree that can be derived from ϕ by deleting, contracting, or replacing constituents in ϕ by items in the lexicon.
- Katzir shows that this gets various facts right about scalar implicatures in non-monotonic environments, downward entailing, etc., that a naive Horn scale-based theory does not derive.

Horn Scales Again

- But wait! Most Griceans do not think of Horn scales in the way that Fox, Katzir, etc. assume.
- Horn scales are generalizations about which items tend to be in competition, not explanations of why these items compete (cf. Russell 2006).
- Interpreting them as lexical or grammatical stipulations about scalar alternatives would be fundamentally anti-Gricean.
    - And empirically wrong, cf. – in addition to Katzir – Hirschberg 1985, Matsumoto 1995.
- Horn scales are something to be explained, not stipulated – and, whatever the explanation is, it may explain Katzir's data as well.

Katzir's approach is not (really) Gricean

- Katzir frames his approach as compatible with a Gricean theory, but this is only apparent.
  - True, his theory involves negating stronger alternatives, but the alternatives are derived by a specialized grammatical module.
  - This is a far cry from the Gricean approach, where alternatives are interpreted as "other things that the speaker could have said or done".
- The question about alternatives for a Gricean is:
  - Why did the speaker do just what he did (say blah) instead of doing something else (saying blah′, or going to a movie, or cooking lobster, or whatever else he might have done but didn't)?

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  - Brevity
  - Quantity and specificity
- Comparison
- Conclusion

Diagnosis

- The problem, in a nutshell: those who complain about symmetry are complaining that Griceans don't give them an algorithm that will tell them what the alternatives are in a context.
- But a Gricean should not expect such an algorithm to exist (other than a complete theory of rational decision and action!).
- We can't expect any single factor will always be decisive in determining what the alternatives are in a situation.
- Rather, speakers and listeners balance countervailing forces in making communicative decisions (cf. Horn 1984).

Brevity

- One such factor is brevity: "Be brief (avoid unnecessary prolixity)" (Grice 1989).
- From the standpoint of brevity, *some* is better than *some but not all* if you can get your point across by using *some*.
- But this may not always be the case: some contexts call for greater specificity, outweighing the demands of brevity.

Choosing Your Words

- Given the choice between *some* and *all*, brevity is not relevant, and quantity (which one gives more information?) is the only relevant consideration.
  - This is of course not absolute.
  - But it's hard to imagine a context where it would hurt to use *all* rather than *some* if *all* is true.

- What about the choice between *some* and *some but not all*?
  - *some but not all* gives more information (excludes more possibilities);
  - *some* is easier to say.
  - Which one is better in a given context?

Choosing Your Words

- In the British National Corpus and the Corpus of American English, *some* occurs over 800,000 times while *some but not all* occurs 211 times - a ratio of almost 4,000:1.
- Contexts where *some but not all* occurs: news reporting, legal contexts, academic articles.

Choosing Your Words

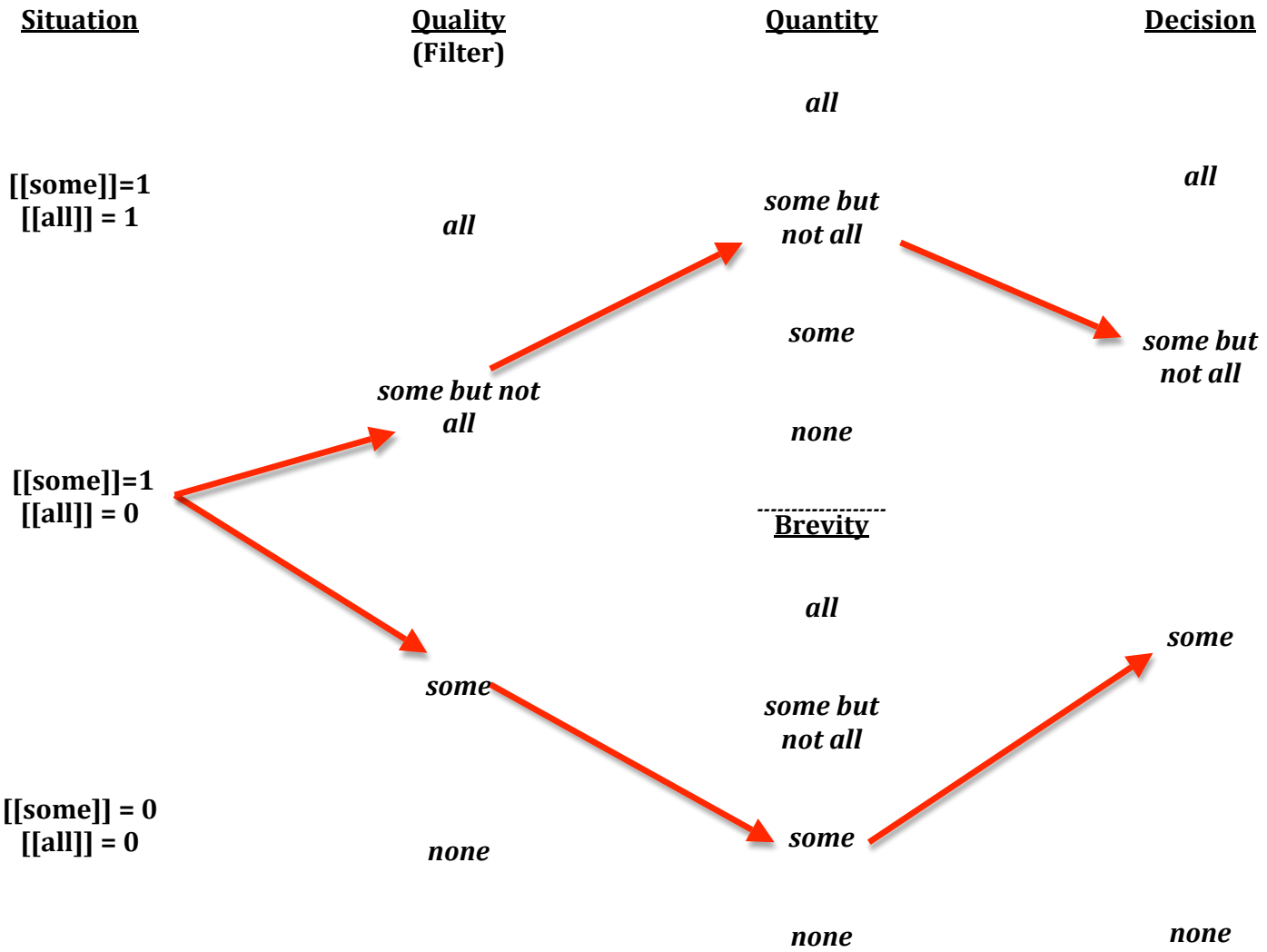
- Another type of context favoring prolixity: explicit denial of a previous "all" claim.
  - *Some* could be construed as compatible with the claim under dispute.
- Examples:
  - *Pfizer catches flak for giving drug discounts to some, but not all, Filipinos.*
  - *Fish oil protects against some, but not all, types of fatty liver.*
- What can we conclude?
  - In some contexts speakers judge that the benefits of being highly explicit outweigh the demand for brevity.
  - In other contexts – e.g., in casual conversation – speakers judge that the demand for brevity is more important.

Some vs. *Some but not all*

- What factors go into a speaker's choice to use *some* rather than *some but not all* when this choice is available? For instance:
  - What is the likelihood that my audience will fail to recognize my reasons for using one form rather than the other?
  - How important is it that I communicate precisely my intended meaning in the present situation (rather than leaving the upper-bound inference to my audience, and trusting them to infer it)?
  - Is the possibility of miscommunication large enough, and/or the disutility of failure great enough, to justify the extra effort of using the longer form?
- The choice of alternatives, on this approach, is not a matter of following some algorithm but of making the best possible decision given your beliefs and preferences.

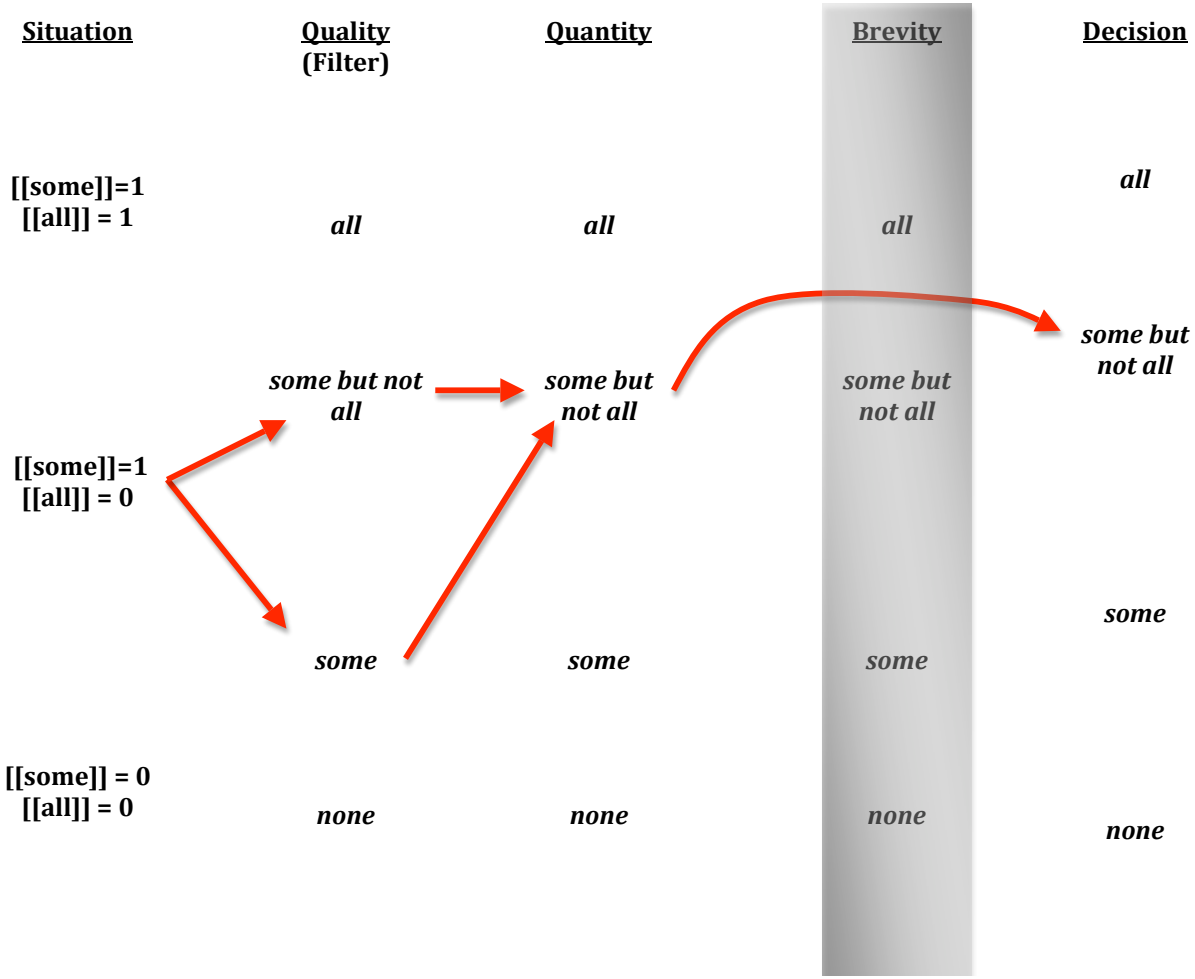
Some vs. *Some but not all*

Graphically, the decision procedure is:



Some vs. *Some but not all*

If Quantity is more important than Brevity:



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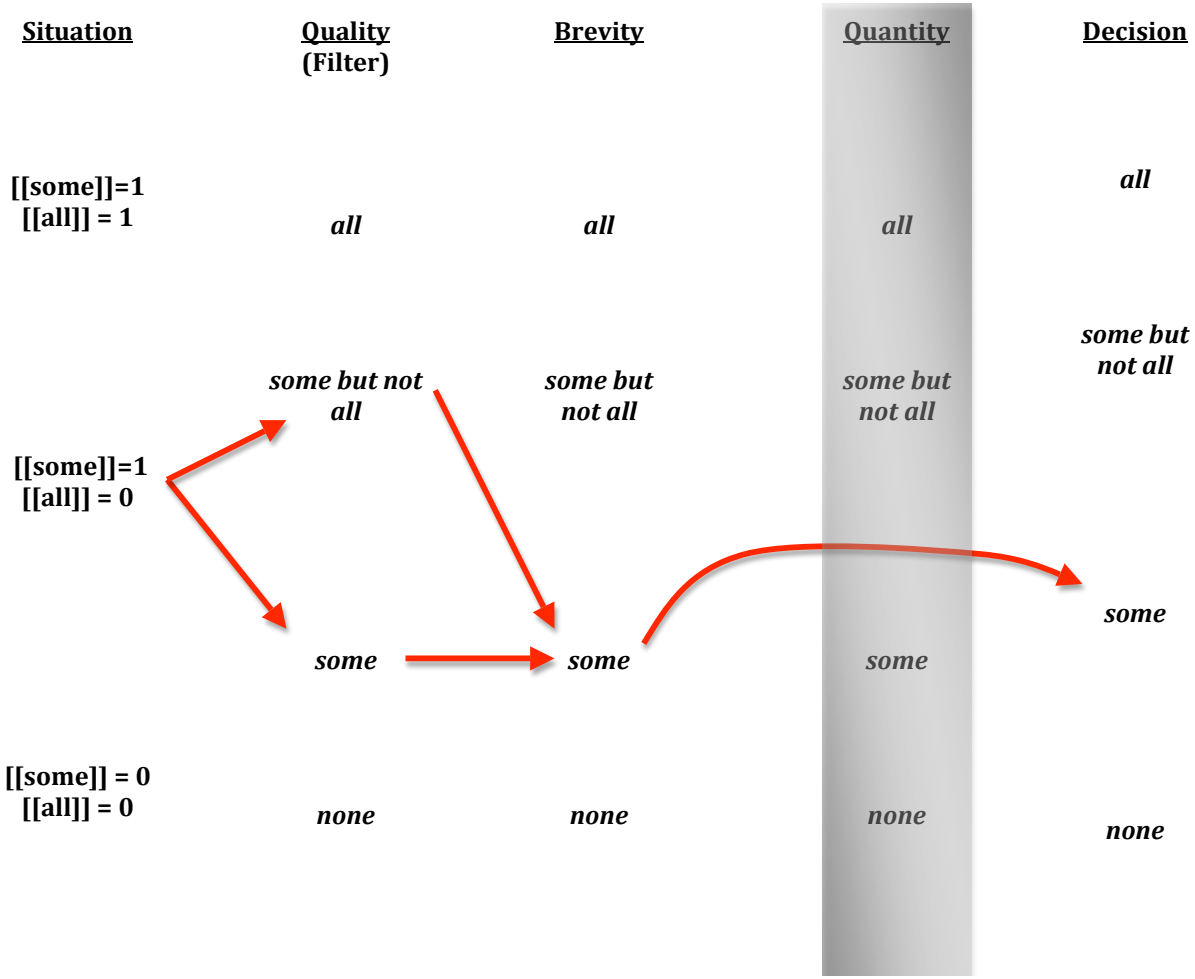


Some vs. *Some but not all*

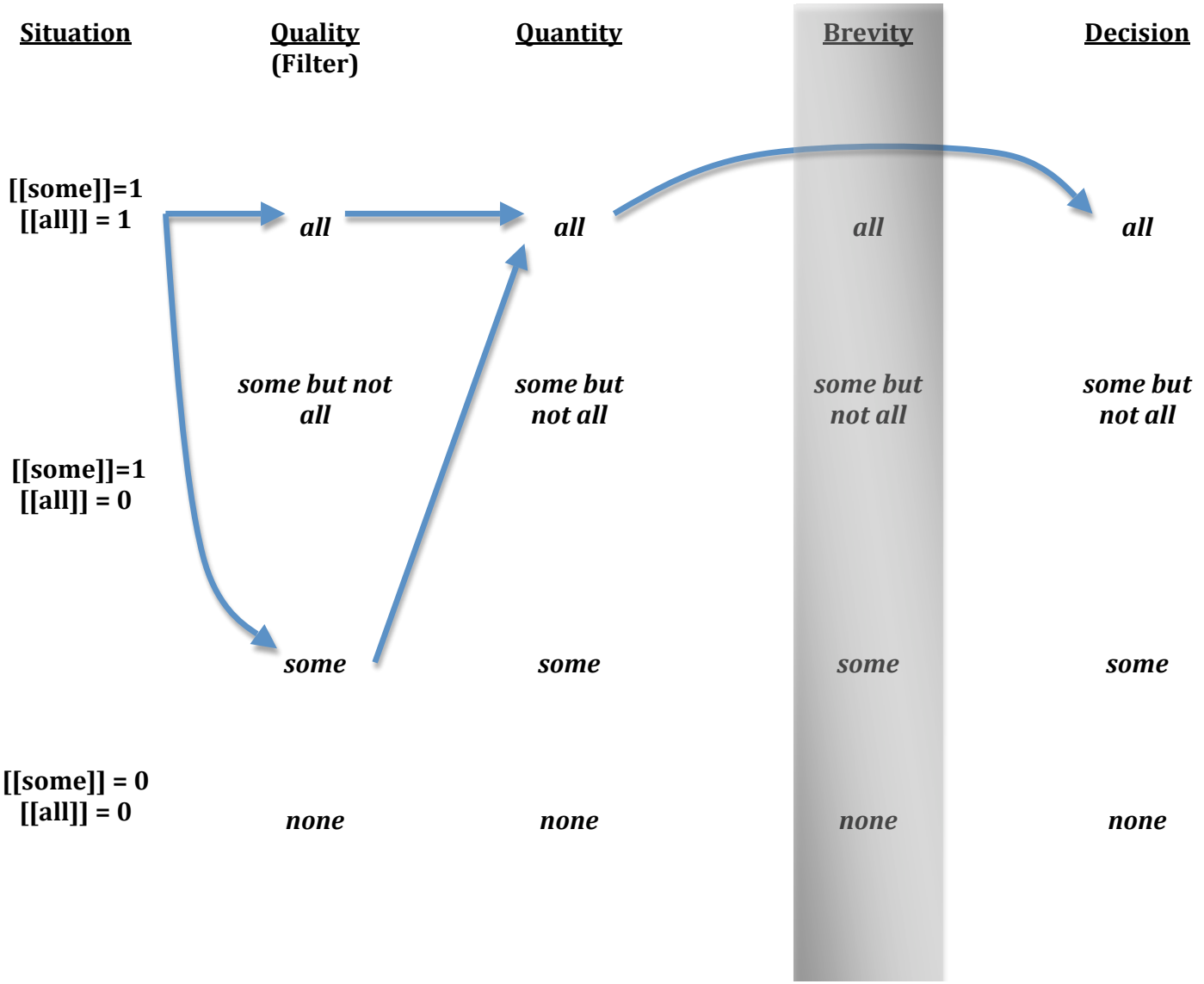
- The choice between *some* and *some but not all* is underdetermined by the maxims.
- The speaker has to rank Quantity and Brevity in order to make a decision.

Some vs. *All*

- What about *some* vs. *all*?
- The choice is unambiguous: if *all* is true, the brevity consideration is not relevant to this choice.
  - Using *all* rather than *some* requires no extra effort on the part of the speaker.
  - And Quantity demands using *all* in preference to *some* when *all* is true.
- So, in any normal context, the speaker will use *all* in preference to *some*.

Some vs. *All*

The result is the same, whichever is ranked higher:



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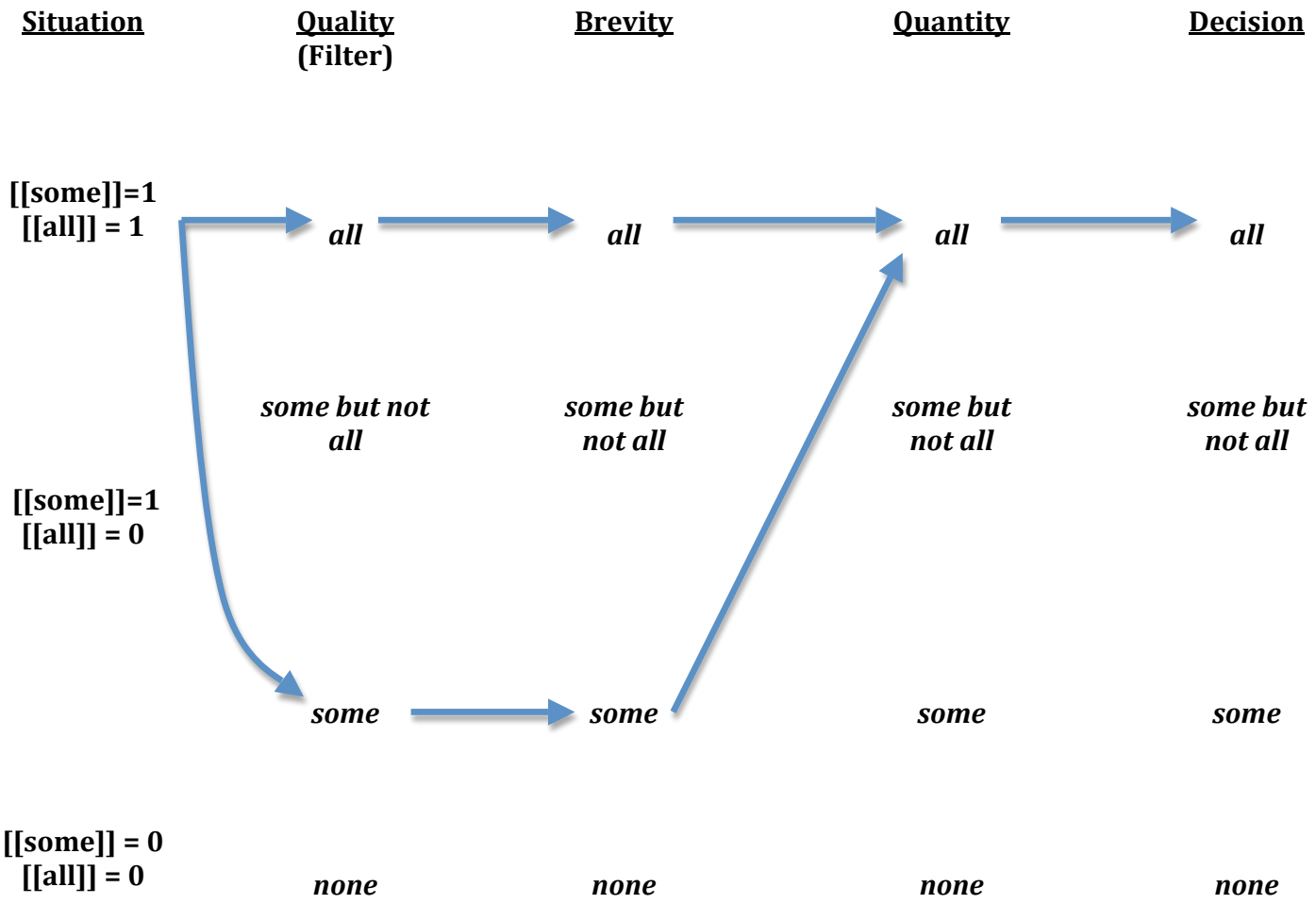


Implicature and Choice

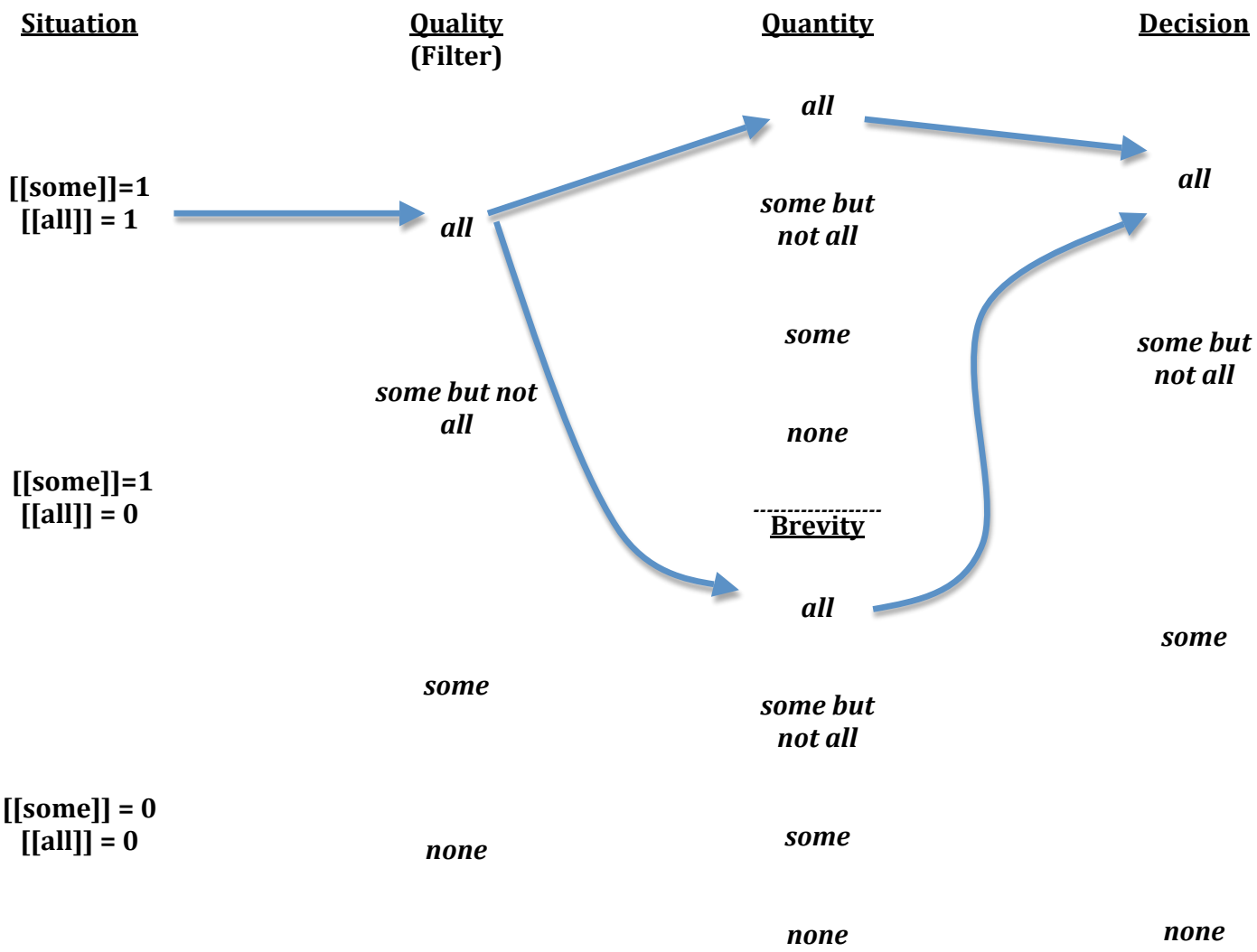
- When the choice between expressions invokes only one maxim, like *some* vs. *all*, the choice is easy for the speaker to make: all paths lead to the same place.
- When the choice invokes conflicting maxims, making a decision involves deciding which maxim is more important.
  - If the context is higher-stakes, the speaker is more likely to prefer the longer form because the disutility of misunderstanding is greater. (legal contexts)
  - When denying a previous *all*-claim, the speaker may prefer the longer form.
  - If neither of these conditions is met, speakers are likely to choose the shorter form.

Implicature and Choice

- How does all this resolve the symmetry problem?
- The Gricean theory of implicature depends on the listener's being able to reconstruct the speaker's motivations for using the words he did.
  - Speakers go through the process described above to choose between *none*, *some*, *some but not all*, and *all*.
  - Listeners work backwards through the same process from the words uttered to infer the speaker's motivations.
- Suppose the speaker says *all*. The hearer can follow the decision tree backwards to choose an interpretation.

Interpreting *all*

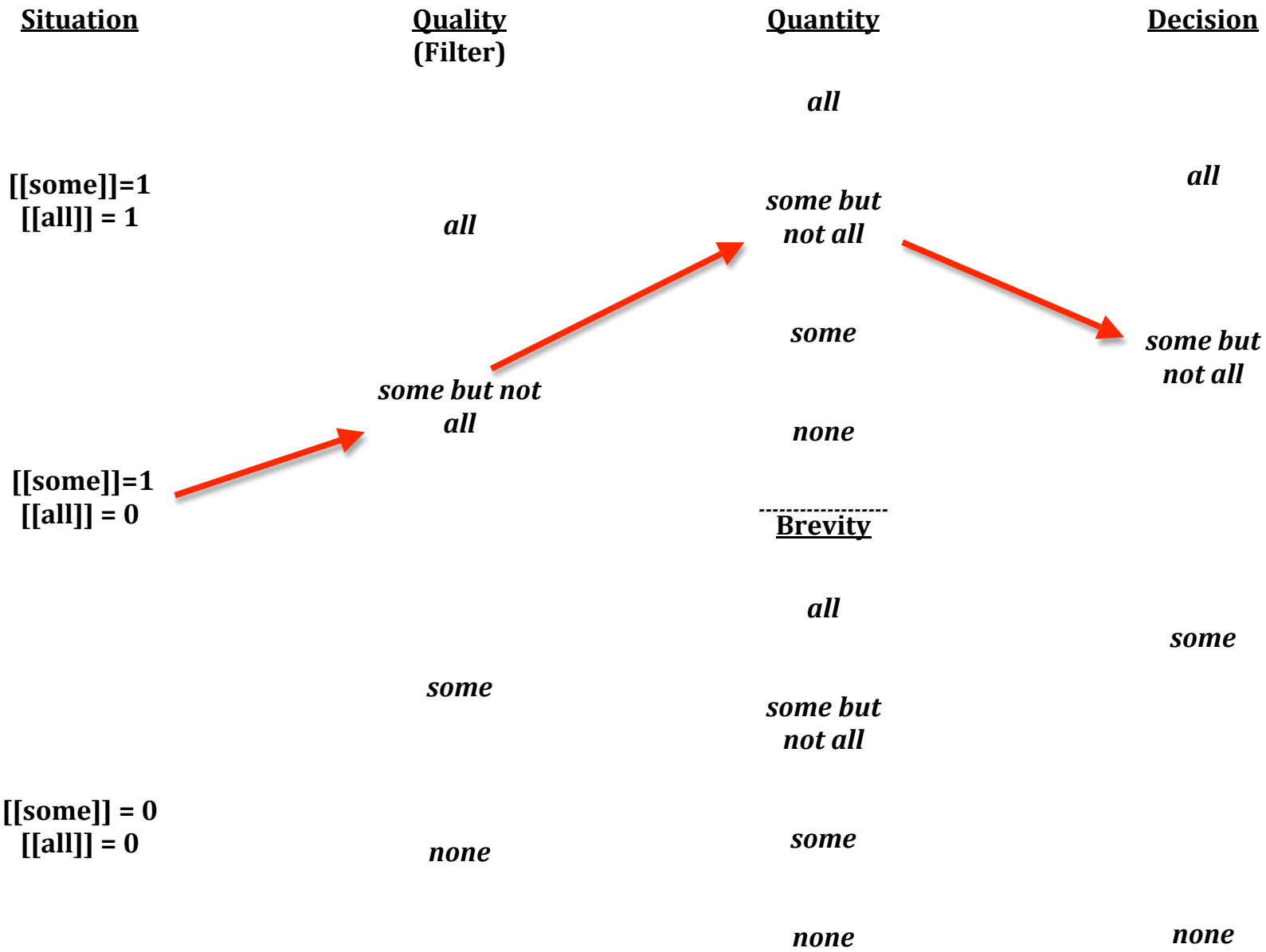
- All paths backward from *all* lead to the same place:



Interpreting *all*

- In the case of *all*, there is no ambiguity: no matter how the speaker ranks the maxims, he will only say *all* in situations where *all* is true.
- Now suppose the speaker says *some but not all*:

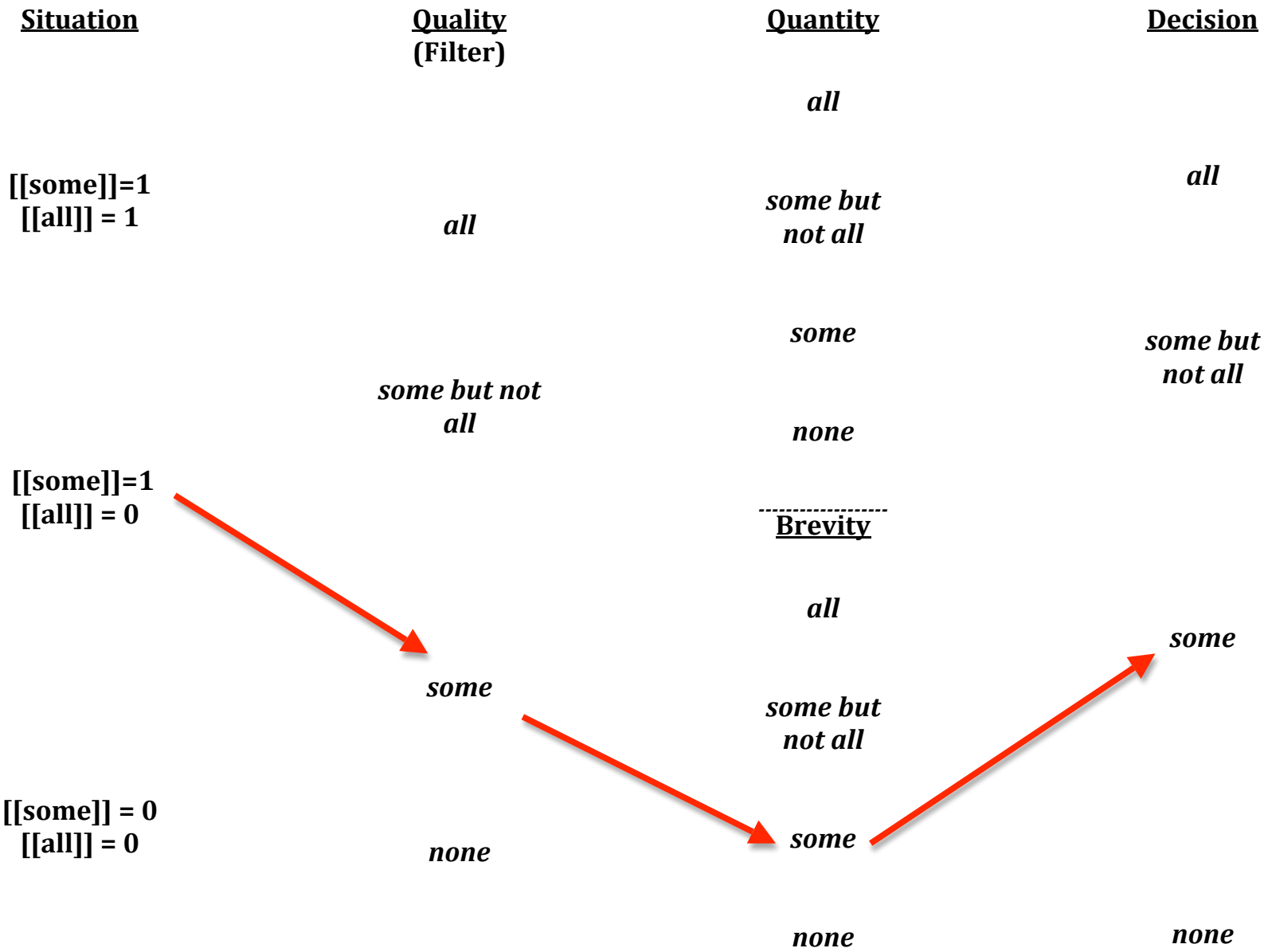
Interpreting *some but not all*



Interpreting *some*

- Like *all*, there is a unique path backwards from *some but not all*:
  - It only appears if $[\![some]\!] = 1$, $[\![all]\!] = 0$;
  - **And** if the speaker judges that Quantity outweighs Brevity.
- Now suppose the speaker says *some*:

Interpreting *some*



Interpreting *some*

- Assuming the speaker knows what situation he is in, there is only one reverse path from *some* to an interpretation – the interpretation $[\![some]\!] = 1$, $[\![all]\!] = 0$.
  - That is, going backwards through the decision process yields the implicature *some* $\rightsquigarrow$ *not all*.
- If the speaker says *some*, the listener can conclude that
  - *All* is not (known to be) true, and
  - The speaker has ranked Brevity above Quantity.
    - I.e., that he thinks that the conversational stakes are not high enough to require the longer (and more informative) form *some but not all*.

Implicature and Choice

- Why not infer ¬(*some but not all*) instead?
- The question is badly posed.
  - Implicature isn't a matter of negating things on the present theory.
  - It's a matter of using the actual utterance to figure out which partition (the speaker thinks) we are in.
- If the speaker knows that we are in the $[\![all]\!]$-partition, he will just say *all* – no matter how he ranks Quantity and Brevity.
- Since the hearer knows this as well, he will not infer from the speaker's saying *some* that he intends to convey that *all* is true.
- But this is just to say that *some* does not implicate ¬(*some but not all*); so the symmetry problem does not arise.

Implicature and Choice

- The structure of the solution:
  - Gricean interpretation requires the speaker to move backwards through the decision process from **what was said** to **what situations would cause the speaker to say it**.
  - No decision path leads from
    - a situation where speaker knows that *all* is true, to
    - the conclusion that the best decision is to utter *some*.
  - So the inference does not arise.
- The fundamental difference between Gricean reasoning and the algorithmic approach is crucial to explain why symmetry is not a problem.

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- The Symmetry Problem and Katzir's Proposal
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  - Methodological Issues
  - SIs in Downward and Non-monotonic Environments
  - Matsumoto's Sentences
  - Unrelated Alternatives
- Conclusion

Methodological Issues

- So two theories of our three theories avoid the symmetry problem. Time for theory comparison.
- The naive scale-based theory encounters the symmetry problem, which is fatal.
- This theory fails for lots of other reasons too, both methodological and data-driven.
    - And, despite its association with the "Neo-Gricean" label, isn't particularly Gricean in spirit.

Methodological Issues

- As for the remaining two, the (really) Gricean theory is preferable to a grammaticized theory on methodological grounds.
  - It only appeals to independently needed facts about rational decision-making.
  - It also relieves us of the need to treat SI as different from other types of implicature.
    - As in: "Scalar alternatives are generated by a grammatical module, all others are generated by conversational reasoning."
    - And: "Anything that doesn't fit the patterns we're describing isn't really a scalar implicature."

SIs in Downward and Non-monotonic Environments

- The core arguments for Katzir's approach are examples like (3-4):

(3) Every candidate who sang was elected.
$\rightsquigarrow$"It's not the case that every candidate was elected."

(4) I doubt that exactly three semanticists will sit in the audience.
$\rightsquigarrow$"It's not the case that I doubt that (at least) three semanticists will sit in the audience."

- Katzir notes correctly that these are problematic for a scale-based approach.

SIs in Downward and Non-monotonic Environments

- Katzir gets these right, but so do we.
  - In all Katzir's cases, the alternatives are shorter than the actual utterance.
  - Since brevity favors the shorter alternatives, we expect that the speaker must have some motivation for using the longer form.
  - An obvious motivation would be that the speaker doesn't know that the briefer version is true.
  - This derives the implicature via Quality.

Matsumoto's Example

Matsumoto (1995):

(1) *It was warm yesterday.*
$\nrightsquigarrow$ "It was not a little bit more than warm yesterday."

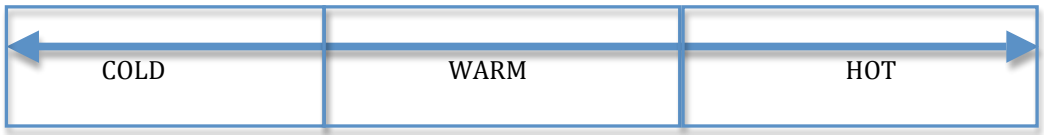
(2) *It was warm yesterday, and it is a little more than warm today.*
$\rightsquigarrow$"It was not a little more than warm yesterday."

- Katzir's approach:
  - Add a clause to the definition of "complexity" allowing that any two constituents that occur in the same sentence count as being equally complex.
  - So, for the purposes of this sentence, *warm* and *a little bit more than warm* can compete.
- Katzir admits, "This looks like a hack added to simulate Matsumoto's results without giving up on structural comparisons".

Matsumoto's Example

(1) *It was warm yesterday.*
$\nrightarrow$ "It was not a little bit more than warm yesterday."

- Someone who says (1) outside of a special context gives no indication that they consider the difference between *just warm* and *a little bit more than warm* to be relevant to the conversation.
- So the speaker of (1) may be working with a coarse-grained partition of W like this:

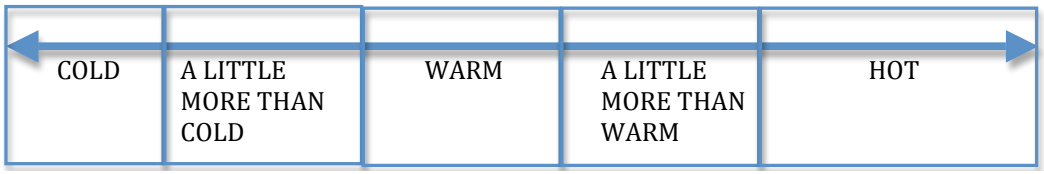


- Someone who says (1) in isolation does not indicate that the stakes are high, and may simply be following Brevity – so no implicature (that it is not a little bit more than warm) is generated.

Matsumoto's Example

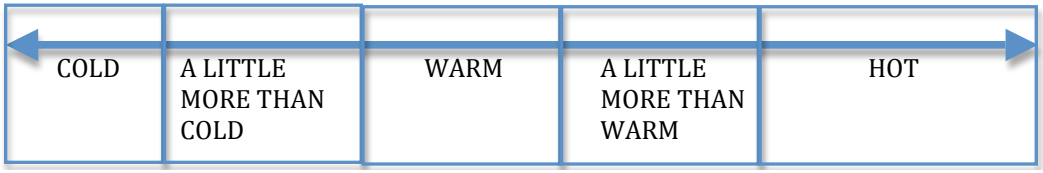
(2) *It was warm yesterday, and it is a little more than warm today.*
$\rightsquigarrow$"It was not a little more than warm yesterday."

- Someone who says (2) indicates that they think that the difference between *warm* and *a little bit more than warm* is relevant to their and their interlocutors' communicative goals.
- So their partition must be more fine-grained, e.g. like this:



Matsumoto's Example

(2) *It was warm yesterday, and it is a little more than warm today.*
⇝"It was not a little more than warm yesterday."



- If this is the relevant partition, then the use of *warm* instead of *a little more than warm* in the first conjunct is meaningful.
- Further, since the speaker uses the longer for in the second conjunct, we know that Quantity is ranked above Brevity.
- So failure to say *a little bit more than warm* in the first conjunct can only be explained on the assumption that it is not true.
- This generates the desired implicature.

Unrelated Alternatives

- The two theories differ in their predictions about unrelated alternatives.
  - On the Gricean theory, syntactically and semantically unrelated alternative utterances can be considered.
  - On Katzir's theory, there should be no SIs arising from syntactically or semantically unrelated alternatives.

Semantically Unrelated Alternatives

[At a golf tournament]

A: Did you get any autographs?
B: I got Fuzzy Zoeller's.
$\rightsquigarrow$ "I didn't get Jack Nicklaus'." (cf. Hirschberg 1985)

- How does this work? There is no semantic relationship between getting Fuzzy's autograph and getting Jack's.
- But, the SI arises anyway by virtue of a non-semantic *ad hoc* ordering between Jack and Fuzzy (whose autograph is it harder/more valuable/more interesting to get?).
- Katzir explicitly ignores this type of examples, effectively claiming they're not SIs at all.

Syntactically & Semantically Unrelated Alternatives

A: Did you cook dinner?
B: I went to the grocery store.
$\rightsquigarrow$"I did not cook dinner."

- This is a SI involving "process stages" (Hirschberg 1985).
- Hirschberg gives lots more examples of this type, which are problematic for Katzir's theory.

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Conclusion

- The set-up of the symmetry "problem" presumes we need an algorithm for generative alternatives.
  - This way of setting up the problem simply assumes that Grice's rational-action-based approach to implicature is wrong.
  - According to Grice, reasoning about alternatives is reasoning about alternative actions the speaker could have performed, some of which are linguistic.
  - In principle there is nothing wrong with looking for an algorithm; but failure to find one cannot be seen as a problem for a theory which does not endorse this need.

Conclusion

- I argued that the Gricean theory of implicature can account for the symmetry problem in terms of the competition between the maxims of Quantity and Manner.
  - Choosing between *some* and *all* does not require balancing conflicting maxims.
  - Choosing between *some* and *some but not all* does.
  - No situation in which *all* is true is one in which the maxims will direct a speaker to say *some*.
  - Hearers know this, so no "symmetric" SI arises.

Conclusion

- Gricean reasoning
  - Accounts for the fact that alternatives are usually of similar or lesser complexity;
  - Gives a more principled account of Matsumoto's example,
  - And explains why alternatives are sometimes syntactically or semantically unrelated to the actual utterance - a serious problem for the structural theory.