



Lies, damned lies, and argumentative expressions of quantity

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Numerical quantity (again)

- Quantity descriptions are all around us...
- ...and constantly misused...
- in ways that are quite difficult to pin down

Benign(-ish) example

theguardian.com/business/2022/nov/27/brexit-has-made-britain-the-sick-man-of-europe-again

**William Keegan's in
my view**
Economics

Brexit has made Britain the sick man of
Europe again

William Keegan



The Office for Budget Responsibility calculates the cumulative damage of Brexit will be enough to knock 4% every year off our potential GDP. As

obr.uk/forecasts-in-depth/the-economy-forecast/brexit-analysis/#assumptions

Specifically, our latest economy forecast assumes that:

- The new trading relationship between the UK and EU, as set out in the 'Trade and Cooperation Agreement' (TCA) that came into effect on 1 January 2021, will reduce **long-run productivity** by 4 per cent relative to remaining in the EU. This largely reflects our view that the increase in non-tariff

Much less benign example

independent.co.uk/news/world/americas/coronavirus-doctor-mehmet-oz-fox-news-children-death-rate-increase-a9469446.html

News > World > Americas

Coronavirus: Doctor claims 9.8 million people dying could be 'worthwhile payoff' if schools are reopened

'I tell you, schools are a very appetising opportunity,' Dr Mehmet Oz claims

Dr Mehmet Oz had called reopening schools amidst the coronavirus outbreak a very "appetising opportunity," accepting there would be a two to three per-cent increase in deaths as a result.

"I just saw a nice piece in *The Lancet* arguing that the opening of schools may only cost us two to three per-cent, in terms of total mortality," Dr Oz said in an interview on Fox News.

The doctor did not make it explicitly clear whether he thought the increased rates of mortality would apply directly to school children or the entire general population.

Three per-cent mortality of all schoolchildren in America would mean the deaths of approximately 1.7 million children, based on calculations from the government statistics of the number of children attending elementary, middle, and high schools in America

The approximate mortality of three per cent of the total population, not specific to schoolchildren, would mean the deaths of around 9.9 million Americans, based on statistics from the United States Census Bureau.

Per Wikipedia, the Independent is a 'reliable source for non-specialist information'

More typical intermediate example

- *“As a direct consequence, mortgages are going up. And not by a little—hundreds of pounds, £500 is the average, per month”*



- Subsequently paraphrased as
“Some mortgages are going up by an average of £500 per month”

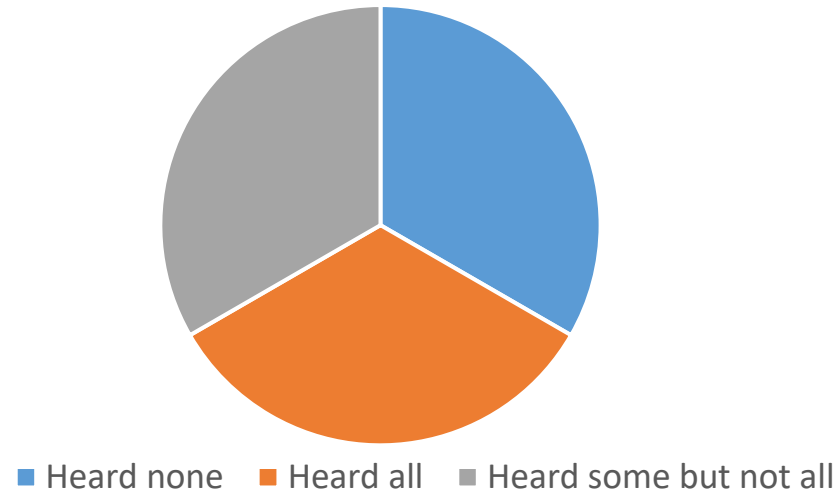
Outline for today

- Embedded quantification (thinking of that example and various others)
 - Usage and interpretation
- Situating that within a model of language use that considers the argumentative dimension
- A few more speculative thoughts about political argumentation from a semantic/pragmatic perspective

Embedded quantification

- A big deal for theories of scalar implicature
 - Notably, the ‘default vs. contextual’ debate
 - Different predictions about the ultimate interpretation, in some cases, rather than just the process, as is usual
- To oversimplify, some examples seem supportive of one theory, some of the other
 - Geurts and Pouscoulous (2009)
 - *Most of the students heard some of the Verdi operas* is sometimes taken to implicate *Most of them heard some-but-not-all*
 - which is not predicted to be generally available under a Gricean approach, because it involves more than just the negation of a stronger utterable alternative

Worked counterexample



- *Most of the students heard some of the Verdi operas is **true***
- *Most of the students heard all of the Verdi operas is **false***
- *Most of the students heard some but not all of the Verdi operas is **false***

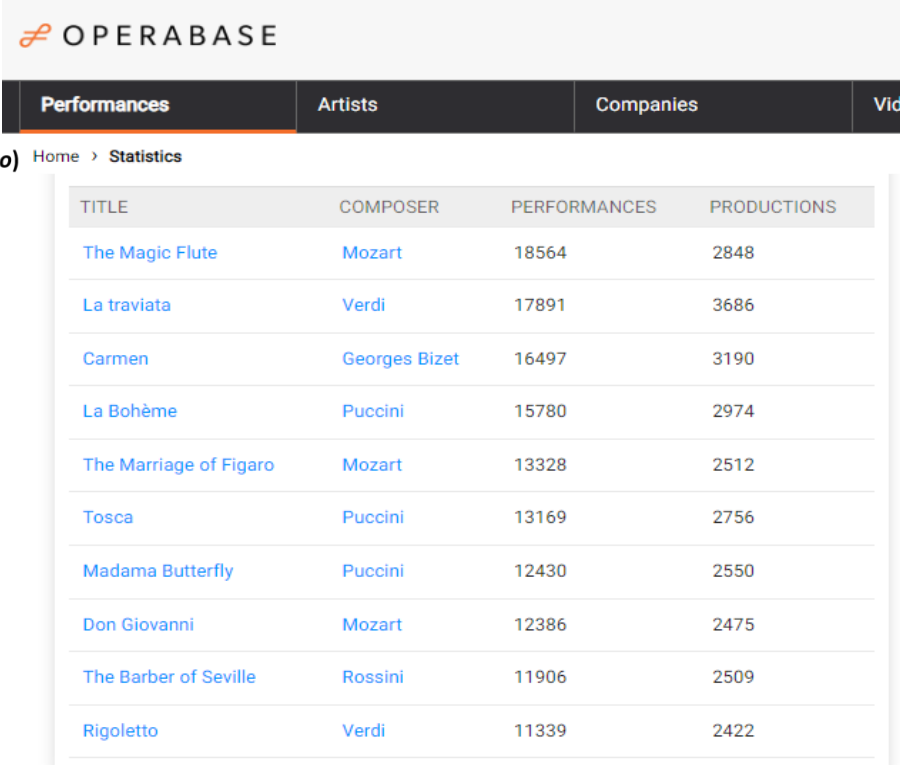
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 - which is not predicted to be generally available under a Gricean approach, because it involves more than just the negation of a stronger utterable alternative
 - *You must hear some of the Verdi operas* is very seldom taken to implicate *You must hear some-but-not-all of them*
 - which should be available if *some* gets enriched in situ, given that the resulting meaning is quite coherent

Routes to embedded enrichments

- Under a Gricean account, we need additional information in order to conclude ‘some but not all’ from embedded *some*
- Several kinds of information might do
 - Note that Verdi wrote a lot of operas

Oberto, conte di San Bonifacio	Un giorno di regno	Nabucodonosor (<i>aka Nabucco</i>)
I Lombardi alla prima crociata	Ernani	I due Foscari
Giovanna d'Arco	Alzira	Attila
Macbeth	I masnadieri	Il Corsaro
La battaglia di Legnano	Luisa Miller	Stiffelio
Rigoletto	Il trovatore	La traviata
Les vêpres siciliennes	Simon Boccanegra	Un ballo in Maschera
La forza del destino	Don Carlos	Aida
Otello	Falstaff	



OPERABASE

Performances Artists Companies Vid

Home > Statistics

TITLE	COMPOSER	PERFORMANCES	PRODUCTIONS
The Magic Flute	Mozart	18564	2848
La traviata	Verdi	17891	3686
Carmen	Georges Bizet	16497	3190
La Bohème	Puccini	15780	2974
The Marriage of Figaro	Mozart	13328	2512
Tosca	Puccini	13169	2756
Madama Butterfly	Puccini	12430	2550
Don Giovanni	Mozart	12386	2475
The Barber of Seville	Rossini	11906	2509
Rigoletto	Verdi	11339	2422

Routes to embedded enrichments

- Under a Gricean account, we need additional information in order to conclude ‘some but not all’ from embedded *some*
- Several kinds of information might do
 - Note that Verdi wrote a lot of operas
 - It’s easy to hear some of them, but difficult to hear all of them
 - 1. $P(\text{heard all}|\text{heard some})$ is very small, for every student
 - 2. Homogeneity among the student group, plus implicature that they didn’t all hear all of the operas
 - 3. Negation of some other alternative, e.g. *Some of the students heard all of the Verdi operas*

Dealing with non-entailing alternatives

- Negation of some other alternative, e.g. *Some of the students heard all of the Verdi operas*
 - Is this actually ‘stronger’ than the uttered content?
 - Not by entailment – but potentially if we are trying to use this to argue towards a plausible conclusion such as ‘These students are especially dedicated scholars of opera’
 - Perhaps (some of) Geurts and Pouscoulous’s participants inferred such a context
- Note that we don’t always care all that much about entailment when we talk about stronger scalar alternatives
 - *<cheap, free>*, *<rare, extinct>*....and perhaps *<two, three>*, etc.
 - Not clear that we have to endorse *Dinosaurs are rare nowadays* or *Air is cheap to breathe*

Non-entailment is the typical case

- Speakers summarising complex datasets are often choosing among alternatives which don't entail one another
- For instance, deciding whether to say something strong about a subset of individuals or something weak about them all
 - As in the Keir Starmer example: *Some mortgages are going up by an average of £500 per month*
 - vs. *Most mortgages are going up by an average of £500 per month*, which wouldn't be true
 - vs. *Most mortgages are going up*, which would be true but doesn't quantify the impact
 - (vs. *Some mortgages are going up by an average of £1000 per month*)

Which is the most effective?

- A very difficult question! For one thing, effective at **what?**
- To think about that question, let's focus on a toy example (Carcassi et al., in prep.)

Imagine you have been hired as a marketing consultant for Green Valley High School. Part of your job is to write a report on the results of standardized math exam questions. These results have been published for Green Valley and for your main rival, Riverside High School.

It's important that you don't tell any lies in the report, but you don't have to report objectively on the facts. **Your aim is to make Green Valley sound like a school whose students have a high probability of success on the exam questions, and Riverside sound like a school whose students have a low probability of success.**

Example item

Describe these results of **Green Valley** so as to make it appear as if there is a **high** success rate without lying.

Daniel	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
Thomas	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
Mia	✓	✓	✓	✓	✓	✓	✓	✓	✗	✗	✗	
Lisanne	✓	✓	✓	✗	✗	✗	✗	✗	✗	✗	✗	✗
Chris	✓	✓	✓	✗	✗	✗	✗	✗	✗	✗	✗	✗

In this exam **SOME** of the students got **MOST** of the questions **RIGHT**.

ALL **MOST** **RIGHT** **SOME** **WRONG** **NONE**

Which is the most effective?

- We could think about this in terms of the range of possible values conveyed (purely semantically or with implicature)
 - *Most of the students got most of the questions right* gives a range of 21-60 (semantically) or 21-52 (pragmatically, after some work) correct
 - *Some of the students got all of the questions right* gives a range of 24-60 (semantically, assuming *some* to be plural) or 24-57 (pragmatically, assuming *most* to be an available alternative) correct
 - *All of the students got some of the questions right* gives a range of 10-60 (semantically) or 10-54 (pragmatically) correct...and so on
- Perhaps more systematically, we could think of it in terms of the relative likelihoods of having different generative processes underlying these observations
 - Then we want the utterance that provides the greatest weight of evidence for our target hypothesis
 - Skipping the details here, but by 'argumentatively effective' this is the kind of thing I have in mind

Can untrained participants be deceptive?

- Broadly, yes!

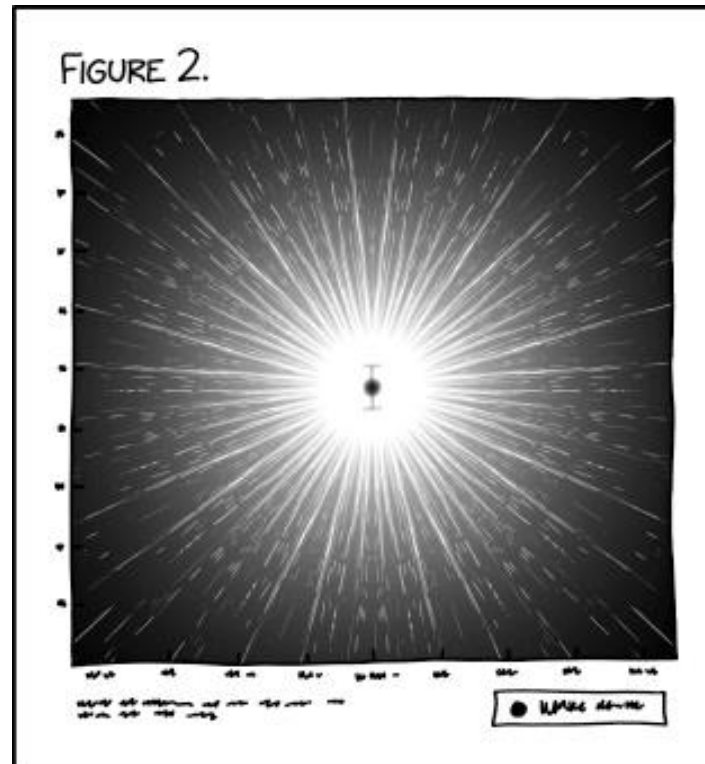
Theresa	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
Nico	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
Julian	✓	✓	✓	✗	✗	✗	✗	✗	✗	✗	✗
Susanne	✓	✓	✓	✗	✗	✗	✗	✗	✗	✗	✗
Johann	✓	✓	✓	✗	✗	✗	✗	✗	✗	✗	✗

- High condition:
22 'some|all|right'
2 'most|some|right'
- Low condition:
16 'most|most|wrong'
7 'some|most|wrong'

- People are very good at (i) modulating their utterances according to the communicative need (ii) in a way that tends to enhance (if not always optimise) argumentative strength

Bright side?

- It's not just politicians!
- Or advertising executives...
- Or academics...



SCIENCE POWER MOVE: WHEN ONE OF YOUR DATA POINTS IS REALLY COOL, DEVOTE A WHOLE FIGURE TO IT.

<https://xkcd.com/2713/>

How can we avoid being misled?

- This turns out to be tricky, rather unsurprisingly...
- As hearers, we might model speakers in several different ways:
 - Speakers select candidate utterances at random from some population of possible utterances, and utter them if they are semantically true
 - Essentially interpreting p as though it were an answer to the question *whether p*
 - Obviously this would make speakers' contributions a fair reflection of reality, and (unrelatedly) is ridiculous...
 - Speakers select candidate utterances at random, and utter them if they are semantically true and do not give rise to false implicatures
 - Speakers select the (semantically and pragmatically true) utterance which is most argumentatively effective for their purposes

Inference under these assumptions

- Suppose a speaker says *Julian got some of the questions right*

Theresa	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
Nico	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
Julian	✓	✓	✓	✗	✗	✗	✗	✗	✗	✗	✗
Susanne	✓	✓	✓	✗	✗	✗	✗	✗	✗	✗	✗
Johann	✓	✓	✓	✗	✗	✗	✗	✗	✗	✗	✗

- If this is taken as a random semantically true statement, hearer should increase subjective probability of ‘school is good’
- If this is taken as a random pragmatically true statement, it conveys ‘but not all’: hearer might increase or decrease subjective probability of ‘school is good’
- If this is taken to be the best available argument in support of the proposition ‘school is good’, hearer should sharply reduce subjective probability of ‘school is good’

Dealing with non-optimal argumentation

- A problem with this approach is that speakers are not actually optimally argumentative (cf. Relevance) even when they are clearly not at all objective
 - e.g. UK universities' press releases on the previous REF (Cummins and Franke 2021)
 - TL;DR – quite misleading, but often suboptimally misleading
 - On the one hand, selective use of non-standard metrics to justify headline “top 10” claims etc.: *Top 20 in the United Kingdom for Research Intensity.*
 - On the other hand, weak evidence focalized by strong institutions: *University of Sussex research is ‘world-leading’, major review finds.*
 - And between these, descriptions that are hard to evaluate from this point of view: *More than 25 per cent of the Durham University subjects entered for REF 2014 were in the top 5 subjects [sic] nationally for grade point average (overall score).*
- Hearer needs to be somewhat paranoid, but not completely

Back to the earlier intermediate example

- *“As a direct consequence, mortgages are going up. And not by a little—hundreds of pounds, £500 is the average, per month”*



- Subsequently paraphrased as *“Some mortgages are going up by an average of £500 per month”*
 - Actual figure £498 based on an average (£217k) mortgage, 2-year fixed rate, 75% loan to value, comparing then-current rates and those from August 2020
 - So this is not the strongest *some* statement you could defensibly make, but nor is it a ‘typical’ true statement on the topic
 - Weak evidence for a suspicious hearer that e.g. ‘Govt. screwed up’
 - Per FullFact, ‘lack[s] important context’ (<https://fullfact.org/economy/labour-starmer-budget-mortgage-increase/>)

Typicality vs. implicature in political claims

- Dialectic that seems to arise, e.g. in ‘culture war’ context, from policies directed towards relatively small groups
 - Proposers of a policy want it to be perceived as representative of the sort of thing they care about
 - Opponents caricature it as ‘apparently what the proposers think is the most important thing’
 - The former suggests something like an inference about typicality, or representativity, in the fashion of the naïve hearer discussed earlier; the latter, something like an exhaustivity inference drawn by the sceptical hearer
 - Again, clearly neither of these interpretations is actually warranted
 - To figure out where we should land between these, need a clearer sense of how argumentativity enters into the picture



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