

Truthmakers for what we say

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Leverhulme Lectures 2019

UCL

Introduction

The project

Truthmaking

“The idea of truthmaking is the idea of something on the side of the world – a fact, perhaps, or a state of affairs – verifying, or making true, something on the side of language or thought – a statement, perhaps, or a proposition.”

Fine 2017, 556

The plot of the lectures

- Natural languages have constructions that connect propositions to their **truthmakers** – the things in the world that make them true.
- Any semantic theory has to account for that connection.
- Once you make the connection, you can reap unexpected benefits in apparently unconnected areas.

Propositions & their truthmakers

A tile from my neighbor's roof hit my car.

- I heard a tile from my neighbor's roof hit my car.
- That tile's hitting my car woke me up.
- Every time a tile from my neighbor's roof hit my car, her insurance paid me £100 (per hit).

Reference to propositions

Me: A tile from my neighbor's roof hit my car.

You: **That** can't be true.

That's very unlikely.

That's impossible.

I know **that**. You told me yesterday.

Reference to truthmakers

Me: A tile from my neighbor's roof hit my car.

You: I heard **it**.

It woke me up.

The incident will be covered by her insurance.

The idea

A proposition picks out a set of possible situations, parts of worlds, that is. Among those might be some that, intuitively, are small enough so as to contain nothing that does not contribute to the truth of the proposition. Those are its exemplifying situations or **truthmakers**.

The price

- In a situation semantics, we have to think about the **possible situations**, not just the possible worlds, where a proposition is true.

The recipe?

Which situations in a proposition might be those that, intuitively, are small enough so as to contain nothing that does not contribute to its truth? What's the recipe for finding them?

Daunting prospects

“There has been a persistent tendency in the literature (we might call it ‘**minimalitis**’) to start off with a hereditary notion of verification and then attempt to get the corresponding notion of minimal verification, or some variant of it, to do the work of exact verification (as in the account of ‘exemplification’ in Kratzer, 2014). But if I am correct, **all such attempts are doomed to failure.**” Fine 2017, 564.

Response

The enterprise might look daunting, but we have no choice. Natural languages **force us** to retrieve truthmakers from propositions. We'd better find out how they do it.

The methodology

Since natural languages have constructions that connect a proposition to its exemplifying situations, there is **factual evidence** for how to construe that connection.

So understood, truthmaker semantics is an empirical enterprise, daunting as it may seem.

The plan

- Background
- Davidsonian event semantics as truthmaker semantics
- A proposal for truthmaking
- Illustrations ... difficult cases
- Adverbial quantification: guide to truthmaking
- Truth-value judgments and truthmaking.
- A question for the next two lectures

Background

A situation semantics

Worlds and their parts

- A set of possible situations with a mereological structure: part relation, sum operation.
- Every situation is part of a unique maximal situation, its world.
- A proposition is a set of possible situations (or the characteristic function of such a set).

Individuals

We privilege certain parts of worlds by ascribing to them properties like being a person, being a cat, being a mountain, being a puddle, and so on.

Events

We privilege other parts of worlds by ascribing to them properties like being swims, walks, flights, and what have you.

Davidsonian event semantics

Davidsonian event talk as truthmaker
talk

Phenomena

- Durational adverbs, manner adverbs, argument structure, causatives, resultatives, aspect, aktionsarten, direct perception reports, event nominalizations, ...
- Those phenomena have been argued to require a Davidsonian event semantics.

Davidsonian event talk

rain(e)

e is an event of raining

In truthmaker talk

rain(s)

s is a situation where it rains (other things might be going on as well).

↓rain(s)

s is a situation where it rains and which is **'minimal'** in the sense that it has no parts where it doesn't rain.

Davidsonian event talk

cross(the road)(Lucie)(e)

e is a completed event of crossing the road by Lucie.

In truthmaker talk

cross(the road)(Lucie)(s)

s is a situation in which Lucie crosses the road (other things might be going on, too).

↓ cross(the road)(Lucie)(s)

s is a **'minimal' situation** where Lucie crosses the road.

Durational adverbials

- Ewan swam **for 10 hours**.

s is a swim & s is past & Ewan is the agent of s & $f_{\text{hour}}(s) = 10$.

- What lasts for 10 hours is a past situation where Ewan swam that is ‘minimal’ in the sense that it has no parts where Ewan didn’t swim.

Building argument structure

- Mo lifted this piano.
s is a lifting of this piano & Mo is **the agent of e.**
- Mo is the agent of a **'minimal'** situation where the piano is lifted.

Manner adverbs

- Ewan swam gracefully.
s is a swim & agent(Ewan)(s) & **graceful(s)**
- What was graceful is a contextually salient past situation where Ewan swam and which is 'minimal' in the sense that it has no parts where Ewan doesn't swim.

Minimality is needed

- Some notion of ‘minimality’ is hard-wired into Davidsonian event semantics.
- Durational adverbs, neo-Davidsonian argument association, manner adverbs, and other phenomena, **require** some kind of **‘minimality’**.

From propositions to truthmakers

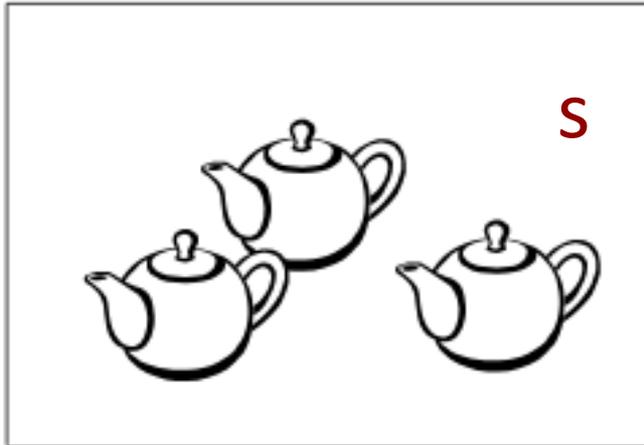
Capturing minimality - of sorts

Truthmakers

A situation s is a **truthmaker** for a proposition p (s **exemplifies** p) iff whenever there is a part of s where p is not true, then s is a minimal situation where p is true.

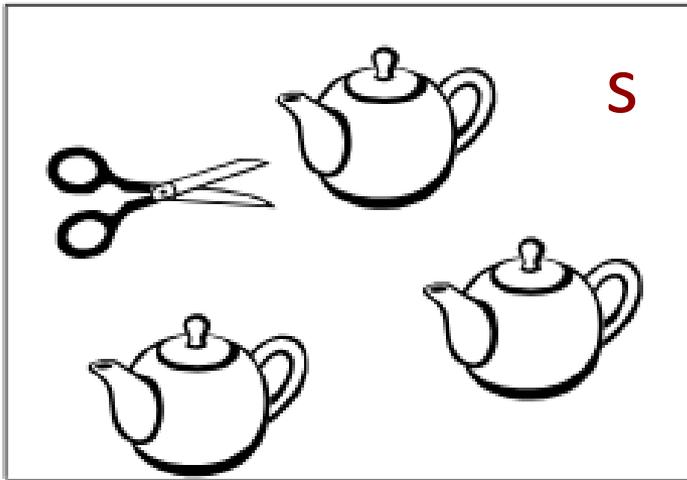
Kratzer 1990, 2002, 2007 (last edition 2019), 2012.

There are three teapots



s is a **truthmaker** for p.
There are parts of s
where p is not true,
but s is a minimal
situation where p is
true.

There are three teapots

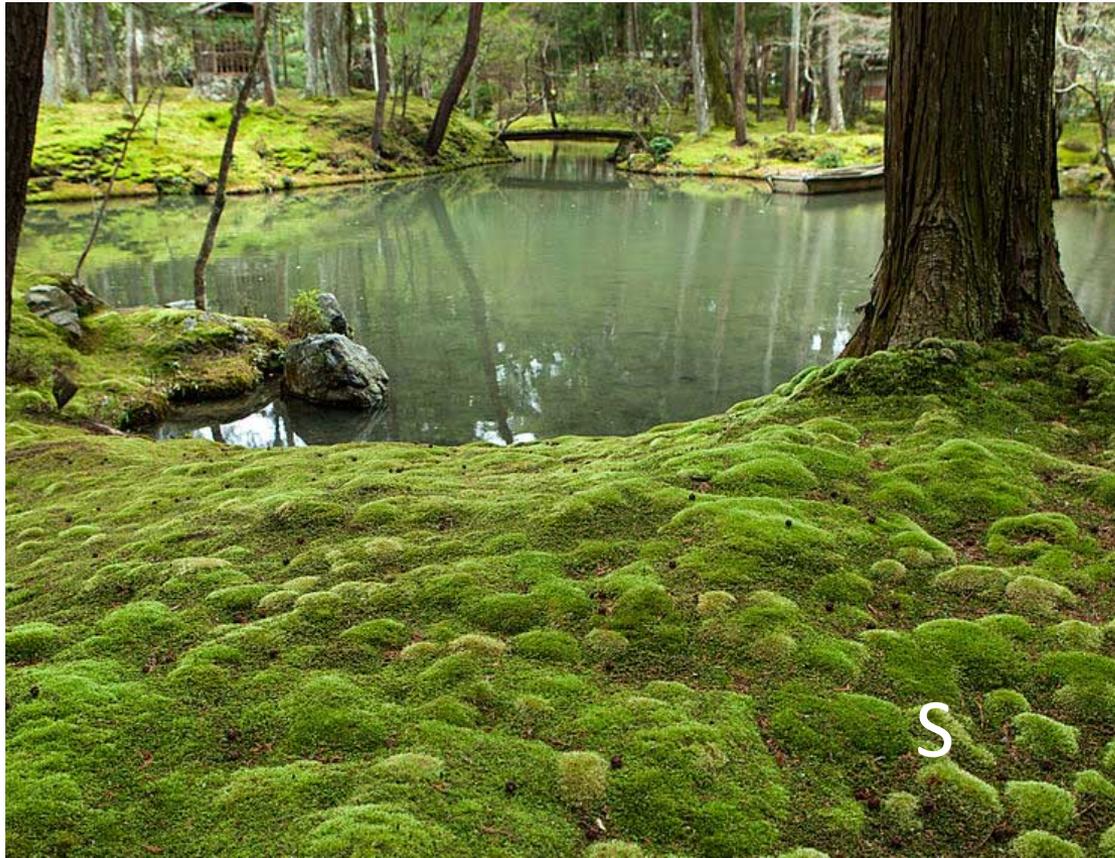


s is **not** a **truthmaker** for p.
There are parts of s where p is not true, but s is not a minimal situation where p is true.



There is moss
p

s is a
truthmaker for
p since there is
no part of s
where p is not
true (let's
pretend).



s

There is moss
p

s is not a truthmaker for p. There are parts of s where p is not true, but s is not a minimal situation where p is true.

There are no teapots

(1) $\lambda s \neg \exists x \text{ teapot}(x)(s)$

- (1) is true and exemplified by any situation without teapots.

(2) $\lambda s (\text{here}(s) \ \& \ \text{now}(s)) \ \& \ \neg \exists x \text{ teapot}(x)(s)$

- Contextual restriction to situations whose spatial location is here and whose temporal location is now.

There are no unicorns

(1) $\lambda s (\text{world}(s) \ \& \ \neg\exists x \text{unicorn}(x)(s))$

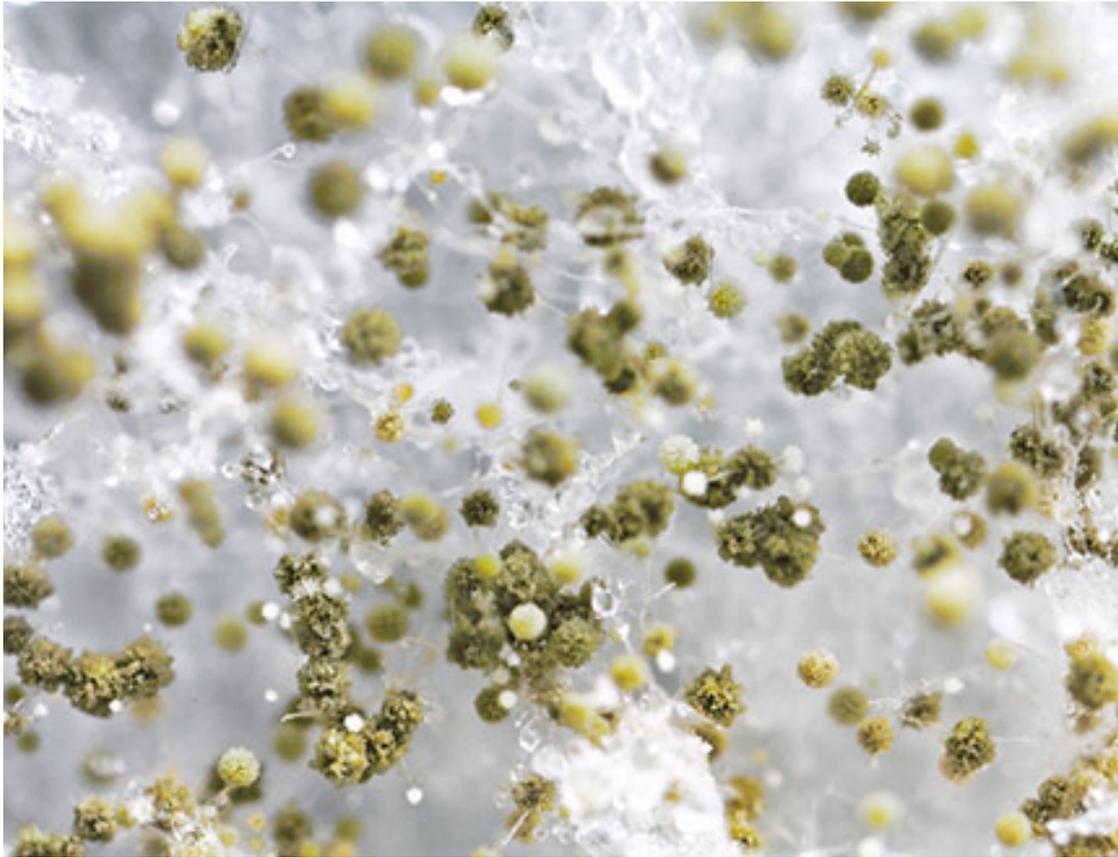
- (1) can only be true in **worlds** and is exemplified by any world where it is true.



Bare plurals and
mass nouns

There are
cups and
saucers.

Whenever
there are
cups and
saucers ...



Bare plurals and
mass nouns

There is dust
and mold.

Whenever
there is dust
and mold ...

Resource situation & maximalization

(1) There are cups. **They** are defective.

$$\lambda s \exists x (\text{cups}(x)(s) \ \& \ \forall y (\text{cups}(y)(s_0) \rightarrow y \leq x))$$

(2) There is mold. **It** needs to be removed.

$$\lambda s \exists x (\text{mold}(x)(s) \ \& \ \forall y (\text{mold}(y)(s_0) \rightarrow y \leq x))$$

- Kadmon 1987, 1990. Kratzer 2007 (2019).

There are more than four cups. They were used in the Mitropa dining cars.



Quantifying over truthmakers

Probes into 'minimality'

Quantification domain?

- Those church bells rang on five occasions (last year).
- All of last year's truthmakers for 'those church bells ring'? No.

Quantification domain?

- Those church bells rang on five occasions (last year).
- All of last year's **minimal** truthmakers for 'those church bells are ringing'?
No.

Quantification domain?

- Those church bells rang on five occasions (last year).
- All of last year's **maximal** truthmakers for 'those church bells are ringing'?
No.

Quantification domain?

- Those church bells rang on five occasions (last year).
- All of last year's **maximal spatiotemporally connected** truthmakers for 'those church bells are ringing'? Closer.

Counting Principle

- A domain of quantification usually cannot contain overlapping individuals.

Casati & Varzi 1999.

- Other counting criteria: e.g. privilege maximal self-connected individuals.

Measuring bell ringing time

- Those church bells rang for a total of 100 hours (last year).
- We are summing up all of last year's truthmakers for 'those church bells are ringing.'

Pairs of teapot sales per day

- Every time I sell two teapots on a single day, I am entitled to a £5 bonus.
- Suppose I sell a total of four teapots on a particular day. Can I ask for a £10 bonus?
- Quantification domain?

Total daily number of teapot sales

- Every time I sell two or more teapots on a single day, I am entitled to a £5 bonus.
- Suppose I sell a total of four teapots on a particular day. What's my bonus?
- Quantification domain?

Total food consumption per day

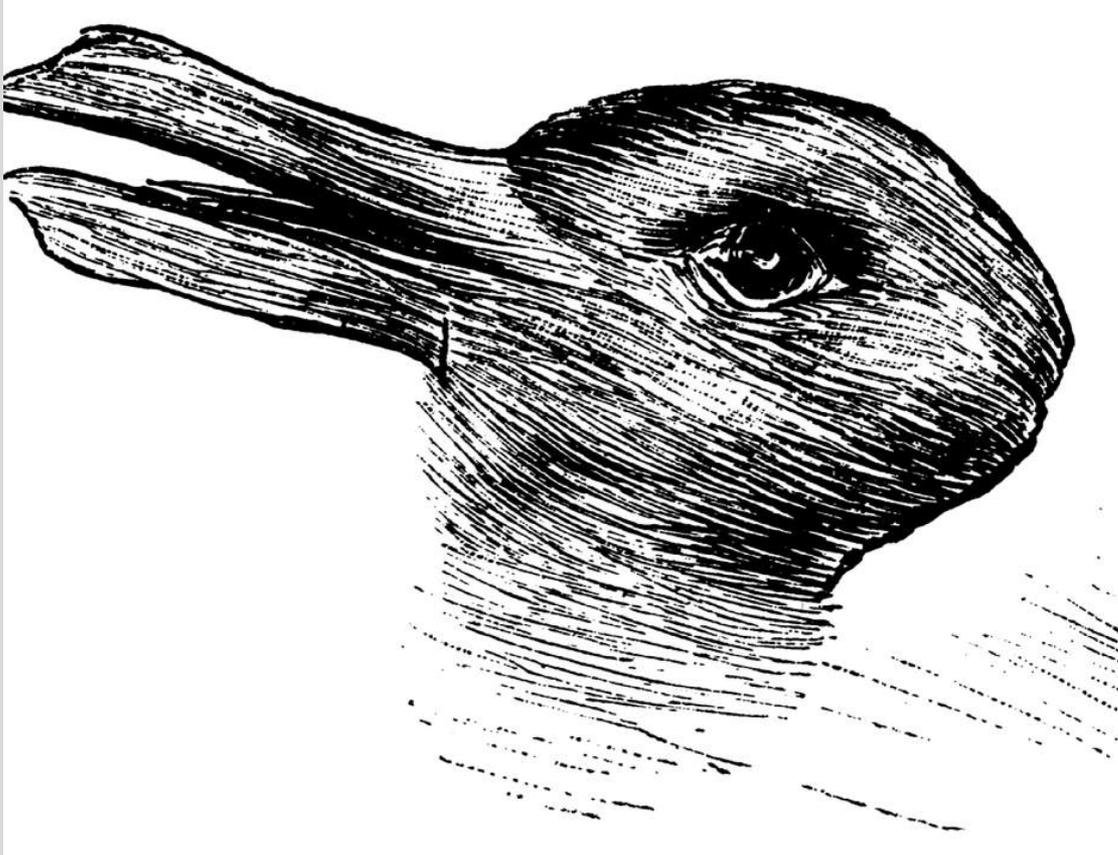
Whenever my cat eats more than half a pound of Super Supper in a day, he gets sick.

Number of guests per wedding

Whenever there are between 20 and 2000 guests at a wedding, a single waiter can serve them.

Illusion of exclusive *or*

- Every time I break a teapot or a coffee cup I have to pay a £5 fine.
- Suppose I drop a tray with a teapot and a coffee cup on it. Both items break simultaneously. What's my fine?
- Quantification domain?



Quantification
domain?

I will pay you
a gold
sovereign
every time
you draw me
a duck or a
rabbit.

Quantification over situations

Whenever ...

Every time ...

Once, twice, three times ...

- Quantification is not necessarily over times or spatiotemporal locations.
- Quantification may require contextually determined resource situations & maximalization.

Truth value judgments

An old puzzle about children's
understanding of quantifiers



Quantifiers Item 5

Is every cowboy riding
a horse?

Cowboy Scenario.
Harry Seymour,
Tom Roeper, & Jill
de Villiers. 2000.
DSLT.
Tryout Edition
The Psychological
Corporation.



Quantifiers – Item 2

Is every girl riding a
bike?

The Bike Scenario.
From Harry
Seymour,
Tom Roeper, &
Jill de Villiers 2000.
DSLT.
Tryout Edition.
The Psychological
Corporation.

Non-standard responses

Typically developing children who give the standard *no*-response for scenarios like the Cowboy Scenario might also give non-standard *no*- responses for scenarios like the Bike Scenario.

Two kinds of explanations

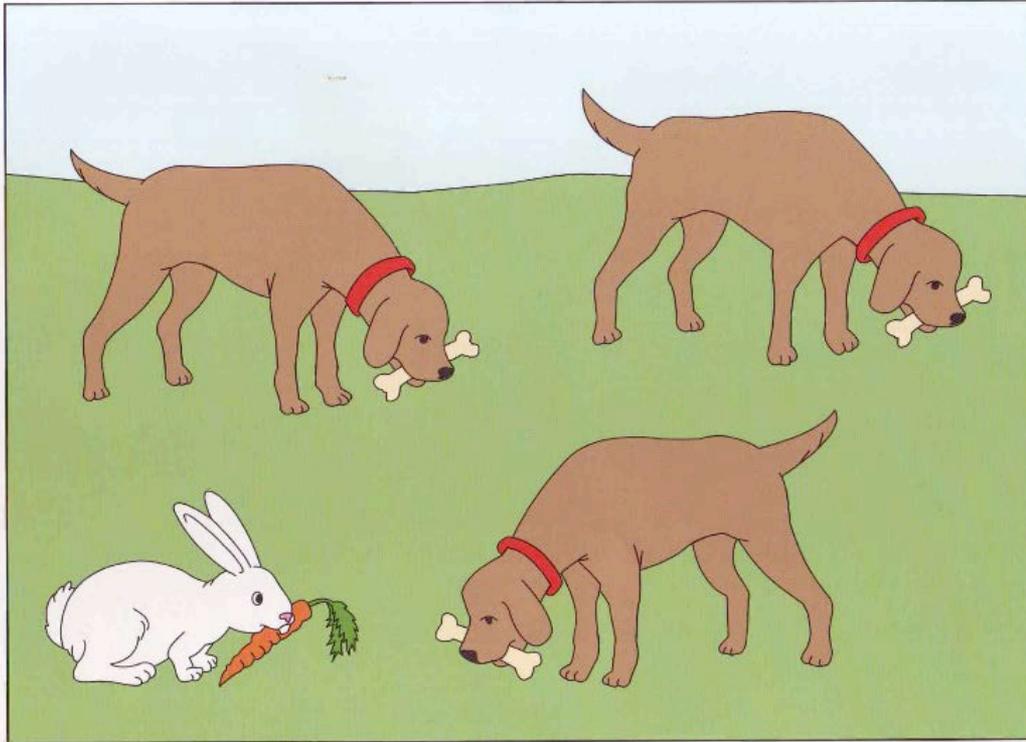
- The children interpret quantifier structures differently: Philip 1995; Geurts 2003, ...
- The children interpret quantifiers like adults. Apparent differences are due to flawed experimental design: Crain et al. 1996; Kratzer 2009 DGfS plenary; É. Kiss & Zétényi 2017, correction 2019.

A different take on the task

Children who give non-standard responses in those tasks might interpret quantifier structures exactly as adults do, but they might have a different take on the relation between the target sentence and the situation they are shown. The omission of irrelevant detail might suggest that the picture is meant to show a **truthmaker** for the target sentence.

Universal quantification

- Every girl is riding a bike.
- $\lambda s \forall x (\text{girl}(x)(s_0) \rightarrow \text{riding-bike}(x)(s))$



Quantifiers - Item 6

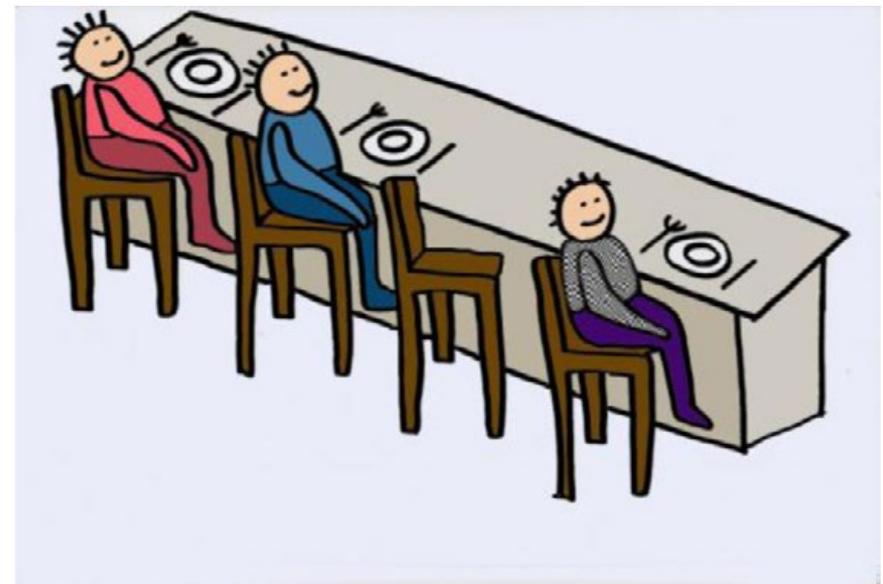
Is every dog eating a
bone?

Dog Scenario.
Harry Seymour,
Tom Roeper, & Jill
de Villiers. 2000.
DSLT.
Tryout Edition.
The Psychological
Corporation.

Extra bunny

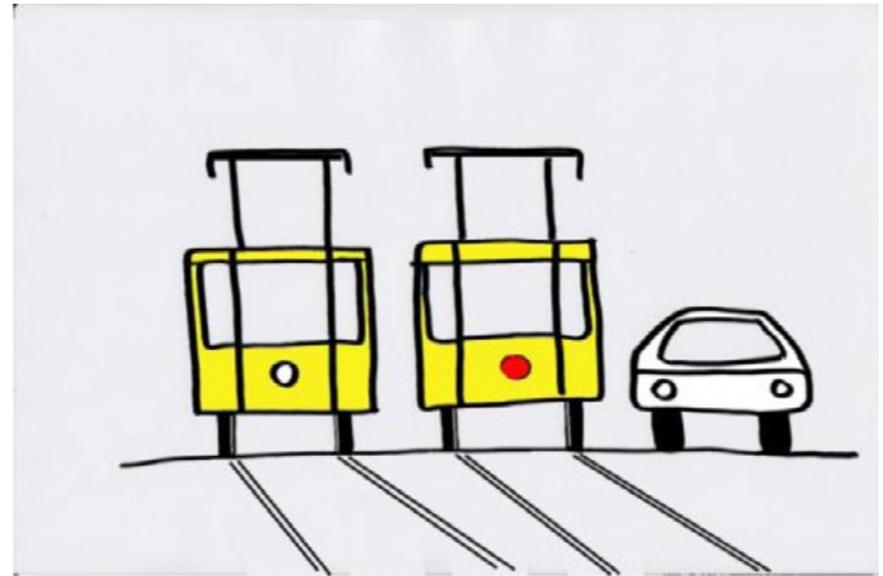
Some children in the Seymour et al. corpus also gave non-standard *no*-responses in the bunny case, pointing at the irrelevant bunny.

Every preschooler is sitting on a high chair



Credit: K. É. Kiss & T. Zétény. 2017. Glossa 2(1): 38.

Every tram is yellow



Credit: K. É. Kiss & T. Zétény. 2017. Glossa 2(1): 38.

Source

Katalin É. Kiss & Tamás Zétényi. 2017. Quantifier spreading: children misled by ostensive cues. *Glossa: A Journal of General Linguistics*. 2(1): 38, 1-20. Correction 2019.

Outlook

Truthmakers for Linguistics &
Philosophy

A take on truthmakers

- There are constructions in natural languages that require a semantic notion of truthmaking.
- Those constructions also offer guidance when our naïve intuitions on truthmaking and minimality give out.

Question

There are ongoing activities in philosophy, computer science, and linguistics that are investigating 'minimal' or 'exhaustive' interpretations for constructions of various kinds. How does a truthmaker semantics relate to those?

Circumscription, minimal models, relevance theory, Gricean pragmatics, syntactically represented exhaustivity operators ...

Exhaustive lists

Admitted Students Fall 3005

Bunny Bean

Charlie Chard

Darrell Dill

Carol Carrot

Spaulding Spinach

Minimal interpretation of stories

A wolf, a goat and a cabbage must be taken to the other side of the river. You have a boat, which is not large enough to take more than one of them. If you leave the wolf with the goat, the wolf will eat the goat. If you leave the goat with the cabbage, the cabbage will be eaten by the goat.

Minimality assumptions

There is exactly one boat, one wolf, one goat, one cabbage, one person in charge of the boat, nobody else to guard animals or cabbage on either side of the river; there is no bridge over the river, nor any other mode of transportation like a helicopter, etc. etc.

Exhaustive interpretation of answers

You: Who showed up?

Me: Two first year students did.

Inference: **Exactly** two first year students showed up and **nobody else did**.

Exhaustive interpretation of answers

You: Who showed up?

Me: Stella or Nina did.

Inference: **Exactly** one of the two girls showed up and **nobody else did**.

Scalar implicatures

Lucie must be familiar with **some** of those arguments. **Inference**: She might not be familiar with all of them.

Lucie is studying **or** she is working in the library. **Inference**: She isn't doing both, she must have some job in the library.

Implicatures from contrastive focus

Paul didn't eat **ALL** of the caramels.

Inference: He ate some.

PAUL didn't eat all of the caramels.

Inference: Somebody else did.

What's next

Which types of 'minimal' or 'exhaustive' interpretations are truthmakers responsible for?

- Yes** Davidsonian event predication, adverbial quantification, minimal interpretation of stories.
- No** Implicatures from contrastive focus.
- ?** Exhaustive answers to questions? Scalar implicatures?

A plan

- **Lecture 2:** Which 'exhaustive' or 'minimal' interpretations are truthmakers responsible for?
- **Lecture 3:** Truthmakers and attitude ascriptions, maybe a bit about conditionals, too.