

Presupposition triggering via idleness avoidance

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Strong and weak quantifiers

Strong quantifiers like *every* and *most* have **existence presuppositions** that their restrictors are non-empty (Strawson 1952, De Jong & Verkuyl 1985, Diesing 1992, Heim & Kratzer 1998, Geurts 2007)

I watched every movie about Richard Montague.

This seems to be the case in every natural language

Weak quantifiers like *some* and *no* seem to have strong and weak readings

- **Strong** reading has an existence presupposition
- **Weak** reading doesn't have an existence presupposition

Intuition

It is sometimes suggested that strong quantifiers have existence presuppositions because **when their restrictor is empty, the content of the nuclear scope argument won't matter for the truth/falsity of the sentence** and that's somehow eschewed

- Given that $\text{every}(R)(S) = 1 \Leftrightarrow R \subseteq S$:
$$\text{every}(\emptyset)(S) = 1 \text{ for any } S$$
- Assuming $\text{most}(R)(S) = 1 \Leftrightarrow |R - S| < |R \cap S|$:
$$\text{most}(\emptyset)(S) = 0 \text{ for any } S$$
- If $\text{most}(R)(S) = 1 \Leftrightarrow \frac{|R \cap S|}{|R|} > \frac{1}{2}$: $\text{most}(\emptyset)(S) = \#$ for any S

Barwise & Cooper (1981) on 'sieves'

While the above intuition seems to be widely shared, only Barwise & Cooper (1981) offer an explicit proposal based on it (Lappin & Reinhart 1988, Abusch & Rooth 2004, Reinhart 2004 pursue other ideas)

A generalized quantifier Q is a **sieve** iff for some sets $X, Y \subseteq \mathcal{D}$, $Q(X) \neq Q(Y)$

This is to say that for a sieve, the nuclear scope argument of the determiner matters for the truth/falsity of the entire sentence

Barwise & Cooper (1981: 179) propose: "It is often assumed in normal conversation that noun-phrases denote sieves."

$\text{every}(\emptyset)$ and $\text{most}(\emptyset)$ are not sieves, so DPs that denote them incur presupposition failure

B&C on weak quantifiers

Unlike the other logical properties Barwise & Cooper (1981) discuss (i.e., live-on/conservativity, strong/weak, witnesses, monotonicity), sieves have scarcely, if any, been discussed in the subsequent literature on natural language quantifiers

A potential reason for this is that the sieveness presupposition predicts that every generalized quantifier should have existence presuppositions

- Given $\text{some}(R)(S) \Leftrightarrow R \cap S \neq \emptyset$, $\text{some}(\emptyset)(S) = 0$ for any S
- Given $\text{no}(R)(S) \Leftrightarrow R \cap S = \emptyset$, $\text{no}(\emptyset)(S) = 1$ for any S

This might not be a bad prediction, if we assume that weak quantifiers do have such readings (i.e. strong readings) but something needs to be said about weak readings

B&C on numerical quantifiers

An interesting prediction of B&C's idea is that some quantifiers should have presuppositions that are stronger than mere existence (cf. Barwise & Cooper 1981: Table 1)

- **more. than. two**(R)(S) $\Leftrightarrow |R \cap S| > 2$,
 - If $|R| \leq 2$, **more. than. two**(R)(S) = 0, for any S
 - So the sieve presupposition of "more than two" is $|R| > 2$
- **fewer. than. three**(R)(S) $\Leftrightarrow |R \cap S| < 3$,
 - If $|R| \leq 2$, **fewer. than. three**(R)(S) = 1, for any S
 - So the sieve presupposition of "fewer than three" is $|R| > 2$
- Similarly, "exactly three" should presuppose $|R| \geq 3$.

B&C on numerical quantifiers (cont.)

A complication here is that these numerical quantifiers should have weak uses that have no presuppositions

There are more than two/fewer than three/exactly three movies about Richard Montague.

In other cases you might be able to perceive the predicted sieve presuppositions

More than two/Fewer than three/Exactly three movies about Richard Montague are more than 2 hrs long.

We'll discuss preliminary experimental data on this later

B&C on 'lexical presuppositions'

Another interesting analytical possibility is that we could also reanalyze what is commonly thought to be the presuppositions of "the", "both" and "neither" as sieve presuppositions

- If $\text{both}(R)(S) \Leftrightarrow |R| = 2 \wedge R \subseteq S$,
 - whenever $|R| \neq 2$, $\text{both}(R)(S) = 0$, for any S
 - The predicted sieve presupposition is $|R| = 2$.
- Similarly for "neither" with $\text{neither}(R)(S) \Leftrightarrow |R| = 2 \wedge R \cap S = \emptyset$
- The uniqueness presupposition is predicted for "the_{sg}" with $\text{the}_{\text{sg}}(R)(S) \Leftrightarrow |R| = 1 \wedge R \subseteq S$

Remarks on B&C (cont.)

An unsatisfying aspect of Barwise & Cooper's proposal is that it only concerns generalized quantifiers and their nuclear scopes

It would be desirable to regard the ban against non-sieves as a special case of the general ban against **idle** expressions Roughly:

- If DP is not a sieve, then the content of its nuclear scope argument won't matter
= the nuclear scope is semantically idle
- Idle expressions are banned in natural language

This is essentially what we will pursue in the rest of the talk

(We'll assume that models have non-empty domains)

Generalized idleness avoidance

Generalized idleness avoidance

A constituent α of Γ is **idle** in Γ iff for some $\alpha' \neq \alpha$, $\Gamma[\alpha/\alpha']$ is grammatical, and for each such α' , $\llbracket \Gamma \rrbracket = \llbracket \Gamma[\alpha/\alpha'] \rrbracket$

Idleness Avoidance: All constituents presuppose that they contain no idle constituent

- VP in "every NP VP" is idle if $\llbracket \mathbf{NP} \rrbracket = \emptyset$ (always true)
- VP in "most NP VP" is idle if $\llbracket \mathbf{NP} \rrbracket = \emptyset$ (always false or #)
- VP in "some NP VP" is idle if $\llbracket \mathbf{NP} \rrbracket = \emptyset$ (always false)

Overgeneration

But this predicts too many presuppositions, e.g.

- NP in "every NP VP" is idle if $\llbracket \mathbf{VP} \rrbracket = \mathcal{D}$ (always true)
- NP in "most NP VP" is idle if $\llbracket \mathbf{VP} \rrbracket = \emptyset$ (always false)

So it is predicted that *every* should presuppose that the nuclear scope does not denote the set of everything, and *most* should presuppose that the nuclear scope is non-empty

There is no evidence for these presuppositions

- a. Everything is self-identical.
- b. Most of us have seen a movie about Richard Montague.

Restrictor-scope asymmetry

Generally quantificational determiners do not trigger presuppositions about their nuclear scopes

To capture this asymmetry between the restrictor and nuclear scope, we'll consider:

- Compositional order (overgenerates)
- Linear order (also overgenerates)
- Local contexts (only predicts existence presuppositions)

Compositional order

Compositional order

Each lexical item that denotes a (curried) function has exactly one argument

Idle Argument Avoidance: All constituents presuppose that their argument is not idle

- "every" doesn't make its NP argument idle
- "every NP" makes the nuclear scope argument idle, if $[[\mathbf{NP}]] = \emptyset$
- "every NP XP" has no argument

Similarly for other quantifiers

Constraining lexical entries

Since compositional order is determined by lexical entries, this version of Idleness Avoidance can be seen as a constraint on possible lexical entries

- A determiner that ignores the NP denotation is logically possible but does not exist, e.g. $\exists(R)(S) \Leftrightarrow S \neq \emptyset$
- It prohibits Sauerland's (2004) connectives L and R : $(\phi L \psi) \Leftrightarrow \phi$, $(\phi R \psi) \Leftrightarrow \psi$
 - Assuming the structure $[S_1 [L/R S_2]]$, the argument of " L " is idle
 - Similarly, the argument of " $R S_2$ " is idle, no matter what S_2 is

Overgeneration

However, this version of Idleness Avoidance is too strong

Problem 1: Predicates

It generates presuppositions for predicates that they are not true of all individuals and not false of all individuals; there are no such idleness presuppositions

- a. Everything [is self-identical].
- b. He [saw a movie about Richard Montague].

Overgeneration (cont.)

Problem 2: Connectives

Connectives are predicted to have idleness presuppositions

Assuming the structure [S1 [and/or S2]],

- "and" should presuppose that S2 is true, lest S1 be idle
- "or" should presuppose that S2 is false, lest S1 be idle

There are no such presuppositions

Two possibilities

We'll present two accounts and how they would deal with weak readings of *some*, *no*, etc.

1. Order-sensitive idleness

- We'll consider two orders, surface and LF, but both have issues

2. Local idleness

- Idleness presuppositions are evaluated against local context

Order-sensitive idleness

Surface order

Constituent α is **L-idle** wrt β iff for some α' and γ (γ possibly null), $\alpha' \neq \alpha$ and $\beta\alpha'\gamma$ is grammatical, and for each such α' and γ , $\llbracket \beta\alpha\gamma \rrbracket = \llbracket \beta\alpha'\gamma \rrbracket$

For subject quantifiers, the restrictor precedes the nuclear scope

$[_{DP} \text{ Every } [_{NP} \text{ billionaire semanticist}]] \text{ } [_{VP} \text{ met Chomsky}]$

- With $\alpha = VP$ and $\beta = DP$, α is R-idle wrt β , if NP is empty
- With $\alpha = NP$ and $\beta = D$, VP is not fixed, so α is never R-idle wrp β

Surface Idleness

Surface Idleness Avoidance: A speech act with expression α presupposes that α contains no constituent that is L-idle wrt its linearly preceding material in α

$[_{DP}$ Every $[_{NP}$ billionaire semanticist]] $[_{VP}$ met Chomsky]

- No presupposition for NP wrt "every"
- No presupposition for DP wrt ε
- Existence presupposition for VP wrt "every billionaire semanticist"

Problem

In natural languages, S may precede R

- a. Every [R billionaire semanticist] [S met Chomsky]
- b. [S Chomsky met] every [R billionaire semanticist]

Surface linear order doesn't seem to matter for the existence presupposition

E.g., (b) doesn't have an existence presupposition for S and doesn't lack an existence presupposition for R

Solution: We'll work with the LF representation instead

LF order

Assumptions:

- All DPs undergo Quantifier Raising (QR)
- All movements, including QR, are upward and leftward

We will be dealing with LFs like the following (we'll ignore TP for simplicity)

- $[_S [_{DP} \text{every } [_{NP} \text{semanticist}]]^i [_{VP} t_i \text{ is poor }]]$
- $[_S [_{DP} \text{Chomsky }]^i [_{DP} \text{every } [_{NP} \text{semanticist}]]^j [_{VP} t_i \text{ despises } t_j]]$

We always have the order "Det R S " at LF, even when S precedes R on the surface

LF idleness

LF Idleness Avoidance: A speech act with an expression with LF α presupposes that α contains no constituent that is L-idle wrt its preceding material in α

Predicates won't have idleness presuppositions about their arguments

- $[_{VP} t_i V_{intr}]$ will be L-idle with respect to " $[_{DP} \text{every NP}]^i$ " if NP is empty
 - Similarly " t_i " and " V_{intr} " will be L-idle if NP is empty
- $[_{VP} t_i [\text{despises } t_j]]$ will be L-idle with respect to " $[_{DP} \text{Chomsky}]^i [_{DP} \text{every } [_{NP} \text{semanticist}]]^j$ " if NP is empty
 - Similarly, " t_i " and " $\text{despises } t_j$ " will be L-idle if NP is empty
 - t_j is trivially not L-idle (will be ungrammatical if replaced)

Problem

We still have issues with connectives

- $[[s \text{ John}^i t_i \text{ smokes }] \text{ [and } [s \text{ Bill}^j t_j \text{ drinks }]]]$

"Bill drinks" will be L-idle wrt "John smokes and", if "John smokes" is false

Likewise:

- $[[s \text{ John}^i t_i \text{ smokes }] \text{ [or } [s \text{ Bill}^j t_j \text{ drinks }]]]$

"Bill drinks" will be L-idle wrt "John smokes or" if "John smokes" is true

Strawson-idleness

- If " S_1 and/or S_2 " presupposed that S_1 was true/false, it'd be Strawson-identical to " S_3 and/or S_2 " for any S_3

α in constituent Γ is **Strawson-idle** iff for some $\alpha', \alpha' \neq \alpha$ and $\Gamma[\alpha/\alpha']$ is grammatical, and for each such α' , $\llbracket \Gamma \rrbracket$ and $\llbracket \Gamma[\alpha/\alpha'] \rrbracket$ are Strawson-identical

LF Idleness Avoidance (ver 2): A use of an expression with LF α presupposes that each constituent in α is not L-idle wrt its preceding material in α , **unless that idleness presupposition would render a constituent in α Strawson-idle**

Problem of existential quantification

This is not a full solution. Consider:

Someone^{*i*} [[_{VP} *t_i* smokes] [and [_{VP} *t_i* drinks]]]

"[_{VP} *t_i* drinks]" will be L-idle wrt "someone [[_{VP} *t_i* smokes] [and", if no one smokes

Importantly, the presupposition "someone smokes" won't render the first conjunct

Strawson-idle, because "Someone smokes and drinks" (presupposing someone smokes) and "Someone VP and drinks" (presupposing someone VP) won't be Strawson-identical for every VP

So we wrongly predict the sieve presupposition that someone smokes

Conceptual issue

Besides, it's perhaps strange to assume that LF constituents are linearly ordered

Local idleness

Local contexts

We follow the Heim-Schlenker theory of local contexts (Heim 1982, Schlenker 2009)

For " $C + \text{Det}^x R S$ ":

- the local context for R is $\{\langle w, g' \rangle \mid \langle w, g \rangle \in C, g \approx_x g', g'(x) \in \mathcal{D}\}$
- the local context for S is $\{\langle w, g' \rangle \mid \langle w, g \rangle \in C, g \approx_x g', g'(x) \in \mathcal{D}\} + R$

To simplify, we represent the local context in terms of w and a set X of individuals

For " $\text{Det}^x R S$ ",

- R is evaluated against a possible world w and $\mathcal{D}$
- S is evaluated against a possible world w and the set of all R -individuals

Local idleness

Local idleness avoidance: Each constituent of an LF representation presupposes that it is not idle wrt its **local context**

A constituent of α in Γ is **idle** wrt its local context $\langle w, A \rangle$ iff for some α' , $\Gamma[\alpha/\alpha']$ is grammatical and for each such α' , $\llbracket \alpha \rrbracket^{w,A} = \llbracket \alpha' \rrbracket^{w,A}$

Example

For "[_{DP} every [_{NP} semanticist]]^x [_{VP} t_x smiled]]"

- The local context for the NP (restrictor) is $\langle w, \mathcal{D} \rangle$, and it's simply not idle, because $\llbracket \text{semanticist} \rrbracket^{w, \mathcal{D}} \neq \llbracket \text{NP} \rrbracket^{w, \mathcal{D}}$ for some NP
- The local context for the DP is $\langle w, \mathcal{D} \rangle$
- The local context for the VP (nuclear scope) is w and the set of all semanticists. If there is no semanticist, the VP will be idle, because for each VP', $\llbracket \text{VP}' \rrbracket^{w, \emptyset} = \emptyset$

Likewise, predicates presuppose that each argument is non-trivially quantified over (i.e., their binders are non-trivial quantifiers)

Connectives

For "[_S John^{*i*} t_{*i*} smokes] [and [_S Bill^{*j*} t_{*j*} drinks]]",

- Suppose the global context is ignorant about whether John smokes and whether Bill drinks (because otherwise the conjunction would be infelicitous anyway)
- The local context for "John smokes" is $\langle w, \mathcal{D} \rangle$. It's simply non-idle
- The local context for "and Bill drinks" is $\langle w, \mathcal{D} \rangle$. It's simply non-idle
- The local context for "Bill drinks" is $\langle w, \mathcal{D} \rangle$ where John smokes in w ; it would be idle if there's no such world, but by assumption there is such a world

Similarly for disjunction, except that the local context for the second disjunct is the negation of the first disjunct

Weak quantifiers

Weak quantifiers are not associated with existence presuppositions

We account for this with a Diesing-style structure

- "Some semanticists smiled" $\mapsto \exists^i [_{VP} [_{NP} \text{some}_i \text{ semanticists}] [_{V'} t_i \text{ smiled}]]$
- "No semanticists smiled" $\mapsto \neg \exists^i [_{VP} [_{NP} \text{some}_i \text{ semanticists}] [_{V'} t_i \text{ smiled}]]$

The VP is a conjunctive argument of the unquary quantifier $\exists$

Assuming that $\mathcal{D} \neq \emptyset$,

- VP, NP, V' are all not idle

Numerical quantifiers

This account only predicts existence presuppositions for all quantifiers

For "[_{DP} more than two [_{NP} semanticists]]^x [_{VP} t_x smiled]]"

- The local context for the NP (restrictor) is $\langle w, \mathcal{D} \rangle$, and it's not idle, because $\llbracket \text{semanticists} \rrbracket^{w, \mathcal{D}} \neq \llbracket \text{NP} \rrbracket^{w, \mathcal{D}}$ for some NP
- The local context for the DP is $\langle w, \mathcal{D} \rangle$
- The local context for the VP (nuclear scope) is w and the set S of semanticists.
 - If $S = \emptyset$, the VP will be idle, because for each VP', $\llbracket \text{VP}' \rrbracket^{w, \emptyset} = \emptyset$
 - If $S \neq \emptyset$, it's possible to find a VP' such that $\llbracket \text{t}_x \text{ smiled} \rrbracket^{w, S} \neq \llbracket \text{VP}' \rrbracket^{w, S}$

So we lose the predictions for numerical quantifiers

Experiment

We ran an experiment this summer with MA students to test the predictions of B&C's predictions about numerical quantifiers

The visual material was prepared by our BA supervisee, Anastasiia Kazantseva

- To tease apart presuppositions from asserted meanings, we used four projective contexts (polar question, negation, conditional, 'maybe')
- Instead of asking directly about presuppositions, we prepared a forced-choice covered picture task

Background context

Imagine that you are sitting in an armchair in a corner of a large room.

On the opposite corner of the same room, you can see that two of your friends, Anna and Becky, are playing some card game that you do not know about.

You have understood that the card game involves two types of cards, **dog cards** and **cat cards**, and that some cards are **strong** and some cards are **weak** in the game. But because you do not know the rules, you don't know which are strong and which are weak.

Now suppose further that from where you are sitting you can see what cards Becky has, but you only see the backs of Anna's cards.

Background context: example visual scene



Background context (cont.)

Suppose also that you have two other friends in the same room, Chris and David, who are watching Anna and Becky playing the card game.

Chris and David are walking around, so they can see both players' cards.

But Chris is not familiar with the rules of the card game, so he checks with David, who is an expert of the game, whether his understanding is correct, by whispering to him different things about the players' cards.

Your task is to tell us whether what Chris says can be about Becky's cards (which you see) or not, by clicking on one of the girls.

Sometimes the sentence can be about either girl's cards (as in the above example). In that case, please choose Becky



She has some strong dog cards.

Items

We tested 4 target quantifiers (sieve presupp; overt hand). If the covert card is chosen, it should be due to the sieve presupposition

- Every (≥ 1 ; 0)
- One or more (≥ 1 ; 0)
- More than two (> 2 ; $= 2$)
- Fewer than two (> 2 ; $= 2$)

Two baselines

- Both ($= 2$; 4): we know that it presupposes $= 2$, so incompatible with the overt hand
- Exist(ential possessive) (e.g., "She has weak cards") (≥ 0 ; 4): should be compatible with the overt hand

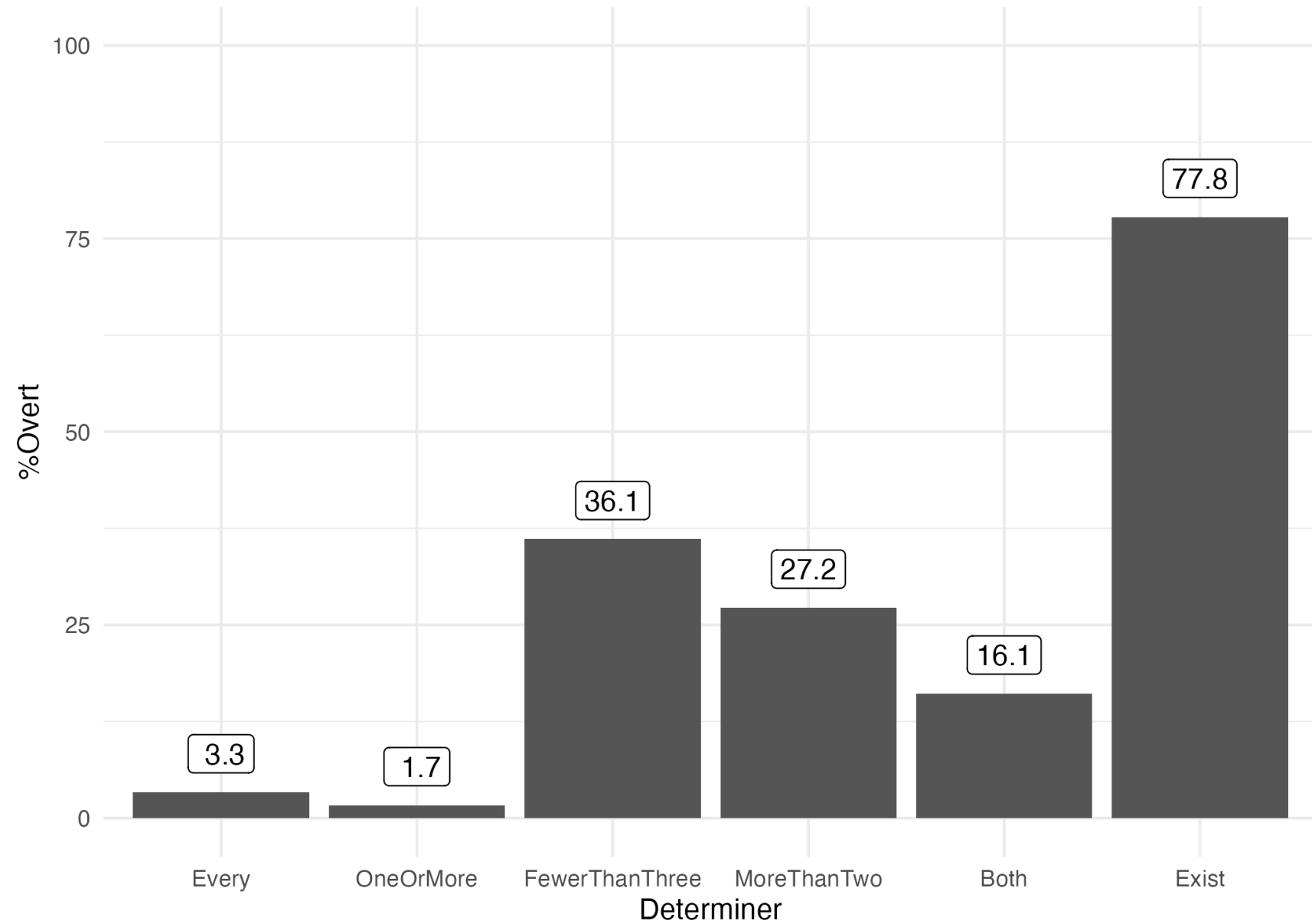
Example linguistic stimuli

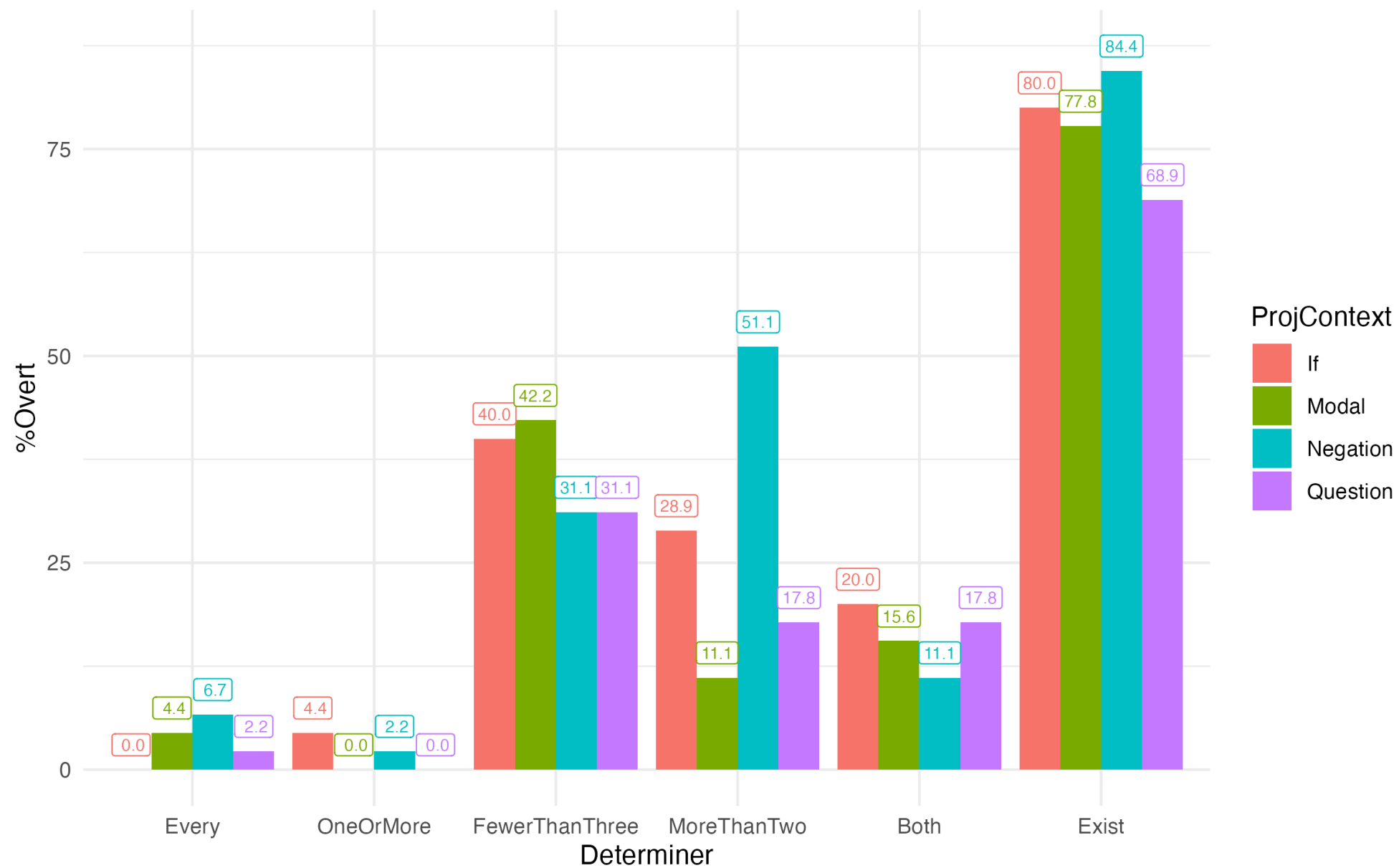
We put each of these quantifiers in 4 projective contexts

- Is every cat card in her hand strong? [polar question]
- I don't think every cat card in her hand is strong [negation]
- If every cat card in her hand is strong, she will win [conditional]
- Maybe every cat card in her hand is strong [modal]

- The NP was always either "cat card(s) in her hand" or "dog card(s) in her hand"
- The VP was always "be strong" or "be weak"

(Except for Exist where it was always "She has weak/strong cards")





More on existence
presupposition of *every*

Schlenker's examples

Schlenker (2012: p. 422) presents some examples where *every* doesn't seem to trigger existence presuppositions

CONTEXT: A professor who is renowned for the difficulty of his tests announces to his students:

I'll give a bottle of champagne to every student who gets a perfect score on the next test.

This example is amenable to the analysis with (generic) modal quantification where the existence presupposition is accommodated with respect to the modal base (cf. Heim & Kratzer 1998, Geurts 2007)

Schlenker's examples

CONTEXT: I have been on the admissions committee for the last 20 years. Talking about this period, I say:

Each year, every applicant who already had a published paper got in.

If the existence presupposition projected universally, it should entail that in each of the 20 years, there was at least one applicant who already had a published paper

Such a universal presupposition doesn't seem to be perceived

Based on this, Schlenker (2012) claims that *every* has a reading without an existence presupposition

More examples

In similar examples, the existence presupposition very robustly projects universally:

CONTEXT: I have been on the admissions committee for the last **3** years. Talking about this period, I say:

Each year, every applicant who already had a published paper got in.

CONTEXT: I have been on the admissions committee for the last **2** years. Talking about this period, I say:

In both years, every applicant who already had a published paper got in.

Remarks

Note also that the anti-duality and anti-singularity anti-presuppositions project existentially (i.e., in at least one of the years, there were more than 2 elements in the restrictor)

The existence presupposition behaves more like a presupposition than like an anti-presupposition in this respect

It remains open what's happening in Schlenker's example

An idea: The universal presupposition is actually a plural presupposition with homogeneity/non-maximality ('In these years, there was at least one applicant...') (as I proposed in a separate work)