Scope-taking and presupposition satisfaction

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(1) Karlos stopped smoking.
$\rightsquigarrow$ Karlos smoked. (presupposition)

We have linguistic devices that grammatically encode what we take for granted in making an utterance.

How do we identify presuppositions?

- family-of-sentence tests (Chierchia and McConnell-Ginet, 1990)
- "hey, wait a minute!" test (von Fintel, 2004)

Major research question: what grammatical properties of an expression give rise to its presuppositions?

A compositional account answers two questions:

- how do we grammatically encode presuppositions in simple expressions (presupposition triggers)?
- how do presuppositions project in complex expressions?
  - the "projection problem" (Langendoen and Savin, 1971)

Characterizing and explaining presupposition projection

Much work has gone into simply characterizing presupposition projection behavior (Karttunen, 1973, 1974, i.a.).

Principled explanations have generally taken two approaches:

- a "pragmatic" approach
  - general pragmatic principles are sufficient to properly characterize the presuppositions of complex sentences in terms of the presuppositions of their parts
  - Gazdar 1979, Schlenker 2009, 2011, Lassiter 2012
- a "semantic" approach
  - presupposition projection is a matter of grammar
    - semantic composition

General features of semantic accounts:

- regard presupposition projection as an effect of meaning composition
- deliver **semantic presuppositions**
- depend on pragmatic principles to relate these to actual **observed presuppositions**

Today, I will defend a semantic account of presupposition projection.

It will share properties with other semantic accounts.

- quantifier scope accounts (Russell, 1905)
- multi-valued logic accounts (Beaver, 1999, 2001; Beaver and Krahmer, 2001, i.a.)
- "two-dimensional" accounts (Karttunen and Peters, 1979)
- presupposition as semantic definedness (Heim, 1983)
- presupposition as anaphoric potential
  - DRT-based: van der Sandt 1992
  - dependent type semantics: Bekki 2014, i.a.

The satisfaction account of presupposition projection

The following account (like Heim 1983) relates an expression's presuppositions to its semantic definedness conditions.

- it is **dynamic**: sentences denote **context-change potentials**
  - $[\![S]\!]_{\mathcal{M}} = \phi$
  - $[\![D\ ;\ S]\!]_{\mathcal{M}} = [\![D]\!]_{\mathcal{M}} + \phi$
- the meaning of a sentence is defined (in some linguistic context) just in case its presuppositions are **satisfied** (in that context)
- an expression's presuppositions are just statements of these satisfaction conditions
- it is thus a "satisfaction" account (Karttunen, 1974; Stalnaker, 1974; Heim, 1983; Beaver, 2001; von Fintel, 2008, i.a.)

Plan

The rest of today:

- discuss a general problem for extant satisfaction accounts
  - “trapped presupposition triggers”
  - known in many guises as the “proviso problem” (Geurts, 1996)
- present my account
  - a satisfaction account
  - a three-valued logic account
  - a two-dimensional account
  - a scope-based account

Geurts (1996) notes that certain sentences are predicted to have weaker presuppositions than they are, in fact, observed to have.

(2) If Theo is a scuba diver, he will bring his wetsuit.
$\rightsquigarrow$ If Theo is a scuba diver, he has a wetsuit. (presupposition)

(3) If Theo has a sister, he will bring his wetsuit.
$\rightsquigarrow$ Theo has a wetsuit. (presupposition)

Accounts like Heim's predict the correct presupposition for (2), but too weak a presupposition for (3).

- If Theo has a sister, he has a wetsuit.

$$c + [\![\textit{if Theo has a sister he will bring his wetsuit}]\!]$$

$$= c \setminus ((c + [\![\textit{Theo has a sister}]\!]) \setminus (c + [\![\textit{Theo has a sister}]\!] + [\![\textit{he will bring his wetsuit}]\!]))$$

Defined in exactly those contexts in which

if Theo has a sister he has a wetsuit

is true.

The presuppositions of a complex sentence are defined in terms of the **local contexts** of its presupposition triggers.

- in (2) and (3): $c +$ conditional antecedent

Generalization: the semantic presuppositions of a sentence are often **weaker** than its observed presuppositions.

Much work since Geurts 1996 has been geared towards solving this problem within satisfaction accounts.

Complete solutions must address two problems (Singh, 2007):

- a **strengthening problem**
  - what are the available ways of strengthening a semantic presupposition
- a **selection problem**
  - given the available ways of strengthening a semantic presupposition, which one is selected as the observed presupposition?

Trapped presupposition triggers

The proviso problem is but a collection of instances of a larger generalization.

- **trapped presupposition triggers**

(4) A: My parents think John is in bed.
B: They think I am in bed, too.
$\rightsquigarrow$ My parents think John is in bed. (presupposition)

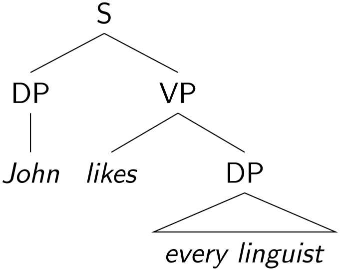
(5) A: John is in bed.
B: My parents think I am in bed, too.
$\rightsquigarrow$ John is in bed. (presupposition)

No relation of strength between the presuppositions.

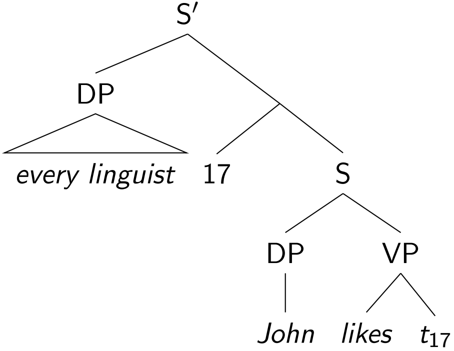
My solution:

Rather than regarding the "strengthening" problem as about strength, let us instead regard it as about **scope ambiguity**.

(6) John likes every linguist.



(6) John likes every linguist.



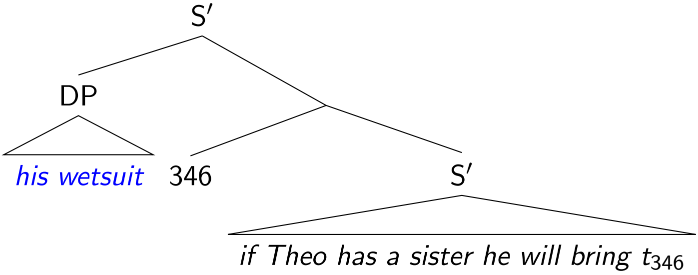
Quantifier Raising (Heim and Kratzer, 1998)

(3) If Theo has a sister, he will bring his wetsuit.

S'

if Theo has a sister he will bring his wetsuit

(3) If Theo has a sister, he will bring his wetsuit.



"Presupposition Trigger Raising"

$\rightsquigarrow$ unconditional presupposition

Presupposition triggers and scope

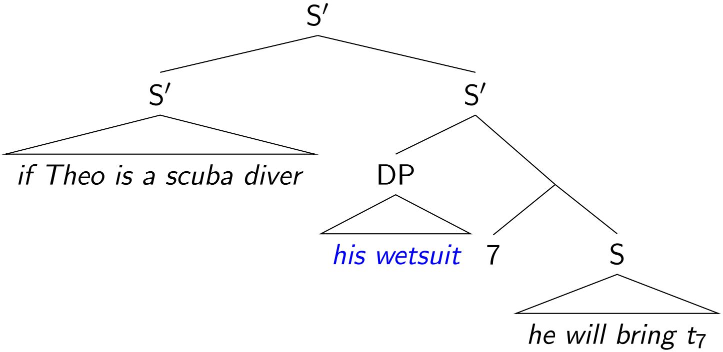
The basic idea

(2) If Theo is a scuba diver, he will bring his wetsuit.

S'

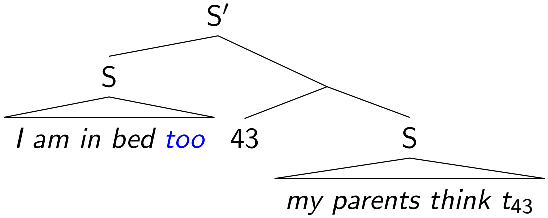
if Theo is a scuba diver he will bring his wetsuit

(2) If Theo is a scuba diver, he will bring his wetsuit.

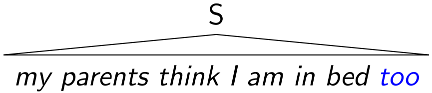


$\rightsquigarrow$ conditional presupposition

(4/5) My parents think I am in bed, too.



$\rightsquigarrow$ *John is in bed*



$\rightsquigarrow$ *my parents think John is in bed*

How do we allow presupposition triggers to take scope?

- via the operators of a **graded monad** (Katsumata, 2014; Orchard et al., 2014; Fujii et al., 2016)

Why? It allows an account that is:

- compositional
- simply typed
- modular

Plan:

- introduce a basic, **presupposition-free** grammar
- add presuppositions via graded monadic **side effects**
  - conditionals
  - indefinites
- conclude

Presupposition-free grammar

We model truth in terms of information states.

- functions from input assignments to sets of output assignments
- meanings will normally be **tests** (Groenendijk and Stokhof, 1991)
  - **true** sentences send input assignments out unmodified
  - **false** sentences throw them out and return the empty set
- $\mathcal{T} ::= e \mid v \mid a \mid t \mid \mathcal{T} \to \mathcal{T}$
- $\texttt{true} \coloneqq (\lambda g.\{g\})\colon\ T \coloneqq a \to a \to t$
- $\texttt{false} \coloneqq (\lambda g.\{\})\colon\ T$

(7) Mary slept.

$$[\![(7)]\!]_{\mathcal{M}} = (\lambda g.\{g \mid \mathbf{sleep}\,\mathbf{m}\})$$

$$\begin{aligned} [\![\mathit{Mary}]\!]_{\mathcal{M}} &= (\lambda g, g'.\mathbf{m})\colon \mathit{E} := \mathit{a} \to \mathit{a} \to \mathit{e} \\ [\![\mathit{slept}]\!]_{\mathcal{M}} &= (\lambda x, g.\{g \mid \mathbf{sleep}(x g g)\})\colon \mathit{E} \to \mathit{T} \end{aligned}$$

$$\begin{aligned} [\![\mathit{Mary\ slept}]\!]_{\mathcal{M}} &= [\![\mathit{Mary}]\!]_{\mathcal{M}} \lhd [\![\mathit{slept}]\!]_{\mathcal{M}} \qquad ((\lhd)\text{: backward app.}) \\ &= (\lambda g, g'.\mathbf{m}) \lhd (\lambda x, g.\{g \mid \mathbf{sleep}(x g g)\}) \\ &= (\lambda x, g.\{g \mid \mathbf{sleep}(x g g)\})(\lambda g, g'.\mathbf{m}) \\ &= (\lambda g.\{g \mid \mathbf{sleep}((\lambda g, g'.\mathbf{m}) g g\})) \\ &= (\lambda g.\{g \mid \mathbf{sleep}\,\mathbf{m}\}) \end{aligned}$$

Dynamic presupposition satisfaction

(1) Karlos stopped smoking.

Karlos and *smoking*:

$$[\![Karlos]\!]_{\mathcal{M}} = (\lambda g, g'.\mathbf{k}) \colon E$$
$$[\![smoking]\!]_{\mathcal{M}} = (\lambda e, g.\{g \mid \mathbf{smoke}(egg)\}) \colon V \to T$$
$$(V \coloneqq a \to a \to v)$$

stopped?

- **anaphoric** to an event
- **presupposition**: the event satisfies the property denoted by its complement (*smoking*)
- **at-issue meaning**: the referent of its subject ended the event to which it is anaphoric

Presupposition success/failure:

- a new atomic type $\#$, with one inhabitant (also $\#$)
- meanings which may be either successes or failures:
  - a successful individual (Karlos):
    $$(\lambda s, f.s(\lambda g, g'.\mathbf{k})) \colon (E \to o) \to (\# \to o) \to o$$
  - a failed individual:
    $$(\lambda s, f.f\#) \colon (E \to o) \to (\# \to o) \to o$$

An α with presuppositions: $(\alpha \to o) \to (\# \to o) \to o$.

Representing an α with presuppositions:

- $(\top \Vdash M) = (\lambda s, f. s M) \colon (\alpha \to o) \to (\# \to o) \to o$
- $(\bot \Vdash M) = (\lambda s, f. f \#) \colon (\alpha \to o) \to (\# \to o) \to o$

$(\phi \Vdash M)$

- returns M when ϕ is true
- returns $\#$ when ϕ is false

What about anaphora?

We introduce a function $\mathbf{P}\colon \mathcal{T}^* \to \mathcal{T} \to \mathcal{T}$.

$\mathcal{T}^*$: the set of strings over $\mathcal{T}$

- possible string of types of anaphoric dependencies

$$\mathbf{P}\epsilon\alpha = (\alpha \to o) \to (\# \to o) \to o$$
$$\mathbf{P}(ae)\alpha = a \to \mathbf{P}e\alpha$$

$[\![\mathit{stopped}]\!]_{\mathcal{M}}\colon (V \to T) \to \mathbf{P}\,V(E \to T)$

$= (\lambda P, e.(P e = \mathtt{true} \Vdash (\lambda x, g.\{g \mid (\exists e'.\mathbf{end}(e g g)(x g g)e')\})))$

What about anaphora?

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$[\![stopped]\!]_{\mathcal{M}} \colon (V \to T) \to \mathbf{P}\,V(E \to T)$

$= (\lambda P.(P\,e = \texttt{true} \Vdash_e (\lambda x, g.\{g \mid (\exists e'.\mathbf{end}(e g g)(x g g)e')\})))$

Meanings of type $\mathbf{P}e\alpha$:

- definedness conditions
- anaphora

What about presupposition satisfaction?

- we need to allow presuppositions to depend on prior context
- the effect of a context is to **change** or **filter** an expression's presuppositions
- we model this effect explicitly by adding a dependency to presupposition triggers of type $T \to T$

$$\mathbf{D}e\alpha = (T \to T) \to \mathbf{P}e\alpha$$

stopped (old):

- $(\lambda P.(Pe = \texttt{true} \Vdash_e (\lambda x, g.\{g \mid (\exists e'.\mathbf{end}(egg)(xgg)e')\})))$
  $(V \to T) \to \mathbf{P}\, V(E \to T)$

stopped (new):

- $(\lambda P, c.$
  $(c(Pe) = \texttt{true} \Vdash_e (\lambda x, g.\{g \mid (\exists e'.\mathbf{end}(egg)(xgg)e')\})))$
  $(V \to T) \to \mathbf{D}\, V(E \to T)$
- abbrv: `stop`

$$
\begin{aligned}
[\![\mathit{Karlos}]\!]_{\mathcal{M}} &= \mathtt{k} \\
&\coloneqq (\lambda g, g'.\mathbf{k}) \colon E \\
[\![\mathit{smoking}]\!]_{\mathcal{M}} &= \mathtt{smk} \\
&\coloneqq (\lambda e, g.\{g \mid \mathbf{smoke}(egg)) \colon V \to T \\
[\![\mathit{stopped}]\!]_{\mathcal{M}} &= \mathtt{stop} \colon (V \to T) \to \mathbf{D}\,V(E \to T)
\end{aligned}
$$

How do we compose such meanings?

- $[\![\mathit{stopped\ smoking}]\!]_{\mathcal{M}} = \mathtt{stop} \triangleright \mathtt{smk} \colon \mathbf{D}\,V(E \to T)$

  (($\triangleright$): forward app.)
- then what?

Something special about **D** (and **P**):

- it is a graded monad

There are three operators: $(\cdot^{\overset{\uparrow}{\mathbf{D}}})$, $(\cdot \overset{\mathbf{D}}{\downarrow}_{e,f})$, and $\mu_{\mathbf{D}_{e,f}}$, satisfying specific laws. $(e, f \in \mathcal{T}^*)$

Defined as:

- $M^{\overset{\uparrow}{\mathbf{D}}} = (\lambda c.(\top \Vdash M))$
- $(\lambda c.(\phi \Vdash_{x_1,\ldots,x_m} M)) \overset{\mathbf{D}}{\downarrow}_{\alpha_1 \ldots \alpha_m, \beta_1 \ldots \beta_n} (\lambda c.(\psi \Vdash_{y_1,\ldots,y_n} N)) = (\lambda c.(\phi \wedge \psi \Vdash_{x_1,\ldots,x_m,y_1,\ldots,y_n} M N))$
- $\mu_{\mathbf{D}_{\alpha_1 \ldots \alpha_m, \beta_1 \ldots \beta_n}}(\lambda c.(\phi \Vdash_{x_1,\ldots,x_m} (\lambda c'.(\psi \Vdash_{y_1,\ldots,y_n} M)))) = (\lambda c.(\phi \wedge \psi[c/c'] \Vdash_{x_1,\ldots,x_m,y_1,\ldots,y_n} M[c/c']))$

$\overset{\uparrow}{M^{\mathbf{D}}} = (\lambda c.(\top \Vdash M))$

- "unit" (or "return")
- injects a value into the graded monad **D** by giving it trivial **side effects** (i.e., presuppositions)

$$(\lambda c.(\phi \Vdash_{x_1,\ldots,x_m} M)) \overset{\mathbf{D}}{\downarrow}_{\alpha_1 \ldots \alpha_m, \beta_1 \ldots \beta_n} (\lambda c.(\psi \Vdash_{y_1,\ldots,y_n} N)) \\ = (\lambda c.(\phi \wedge \psi \Vdash_{x_1,\ldots,x_m,y_1,\ldots,y_n} MN))$$

- "sequential application"
- applies a function with presuppositions to an argument with presuppositions
- sequences their side effects (i.e., presuppositions)

$$\mu_{\mathbf{D}_{\alpha_1 \ldots \alpha_m, \beta_1 \ldots \beta_n}}(\lambda c.(\phi \Vdash_{x_1,\ldots,x_m} (\lambda c'.(\psi \Vdash_{y_1,\ldots,y_n} M))))$$
$$= (\lambda c.(\phi \wedge \psi[c/c'] \Vdash_{x_1,\ldots,x_m,y_1,\ldots,y_n} M[c/c']))$$

- "join"
- collapses two layers of side effects (i.e., presuppositions) into a single layer
- an expression with presuppositions with presuppositions becomes just an expression with presuppositions

Unit, sequential application, and join work together to free trapped presupposition triggers.

Functional application can be modelled as **graded monadic functional application**.

- $(\rhd^*) ::= (\rhd) \mid (\lambda u, v.((\rhd^*)^{\overset{\uparrow}{\mathbf{D}}}\overset{\mathbf{D}}{\downarrow}_{\epsilon,\, e}\, u)\overset{\mathbf{D}}{\downarrow}_{e,\, f}\, v)$
- $(\lhd^*) ::= (\lhd) \mid (\lambda u, v.((\lhd^*)^{\overset{\uparrow}{\mathbf{D}}}\overset{\mathbf{D}}{\downarrow}_{\epsilon,\, e}\, u)\overset{\mathbf{D}}{\downarrow}_{e,\, f}\, v)$

Two "inference" rules:

- $\dfrac{M}{M^{\overset{\uparrow}{\mathbf{D}}}}$ $\qquad \dfrac{m}{(\lambda x.x^{\overset{\uparrow}{\mathbf{D}}})^{\overset{\uparrow}{\mathbf{D}}}\overset{\mathbf{D}}{\downarrow}_{\epsilon,\, e_1}\, m}$ $\qquad \dfrac{m}{(\lambda x.x^{\overset{\uparrow}{\mathbf{D}}})^{\overset{\uparrow}{\mathbf{D}}}\overset{\mathbf{D}}{\downarrow}_{\epsilon,\, e_1}{}^{\overset{\uparrow}{\mathbf{D}}}\overset{\mathbf{D}}{\downarrow}_{\epsilon,\, e_2}\, m}$ $\qquad \dots$
- $\dfrac{m}{\mu_{\mathbf{D}\, e,f}\, m}$

$$
\begin{aligned}
&[\![\textit{Karlos stopped smoking}]\!]_{\mathcal{M}} \\
&= [\![\textit{Karlos}]\!]_{\mathcal{M}}{}^{\overset{\uparrow}{\mathbf{D}}} \lhd^{*} \left([\![\textit{stopped}]\!]_{\mathcal{M}} \rhd [\![\textit{smoking}]\!]_{\mathcal{M}}\right) \\
&= \mathtt{k}^{\overset{\uparrow}{\mathbf{D}}} \lhd^{*} \left(\mathtt{stop} \rhd \mathtt{smk}\right) \\
&= \mathtt{k}^{\overset{\uparrow}{\mathbf{D}}} \lhd^{*} \left(\lambda c.(c(\mathtt{smk}\, e) = \mathtt{true} \Vdash_{e} (\lambda x, g.\{g \mid (\exists e'.\mathbf{end}(e g g)(x g g) e')\}))\right) \\
&= ((\lhd)^{\overset{\uparrow}{\mathbf{D}}}{}^{\overset{\mathbf{D}}{\downarrow}}_{\epsilon, V} \\
&\qquad (\lambda c.(c(\mathtt{smk}\, e) = \mathtt{true} \Vdash_{e} (\lambda x, g.\{g \mid (\exists e'.\mathbf{end}(e g g)(x g g) e')\}))))^{\overset{\mathbf{D}}{\downarrow}}_{V,\epsilon} \\
&\qquad\quad \mathtt{k}^{\overset{\uparrow}{\mathbf{D}}} \\
&= (\lambda c.(c(\mathtt{smk}\, e) = \mathtt{true} \Vdash_{e} (\lambda g.\{g \mid (\exists e'.\mathbf{end}(e g g)\mathbf{k} e')\})))
\end{aligned}
$$

An expression with presuppositions of type $\mathbf{D}\, V\, T$.

(3) If Theo has a sister, he will bring his wetsuit.

Following, e.g., Barker and Shan (2008) and Charlow (2014), the semantics of conditionals is defined in terms of:

- discourse update: $(\,;\,)$
- dynamic negation: $\texttt{not}$

$$\texttt{if}\, m n \coloneqq \texttt{not}(m \;\texttt{;}\; \texttt{not}\, n)$$

$$(\lambda c.(\phi \Vdash_{x_1,\ldots,x_m} p)) \;;\; (\lambda c.(\psi \Vdash_{y_1,\ldots,y_n} q))$$
$$\coloneqq (\lambda c.(\phi \wedge \psi[(\lambda t.c(p \Rightarrow t))/c] \Vdash_{x_1,\ldots,x_m,y_1,\ldots,y_n} p + q))$$

- $(\Rightarrow)$: $T \to T \to T$ is "dynamic implication"
  - $p \Rightarrow q \coloneqq (\lambda g.\{g \mid (\forall g'.g' \in pg) \to (\exists g''.g'' \in qg')\})$
- $(+)$ is information state update
  - $p + q \coloneqq (\lambda g.\{g'' \mid (\exists g'.g' \in pg \wedge g'' \in qg'\}))$

So we're just updating p with q, while weakening the presuppositions of q to depend on p.

Anaphoric dependencies are just combined.

$$\texttt{not}(\lambda c.(\phi \Vdash_{x_1,\ldots,x_m} p))$$
$$:= (\lambda c.(\phi \Vdash_{x_1,\ldots,x_m} (\lambda g.\{g \mid pg = \emptyset\})))$$

- $\texttt{not}(\lambda c.(\phi \Vdash_{x_1,\ldots,x_m} \texttt{true})) = (\lambda c.(\phi \Vdash_{x_1,\ldots,x_m} \texttt{false}))$
- $\texttt{not}(\lambda c.(\phi \Vdash_{x_1,\ldots,x_m} \texttt{false})) = (\lambda c.(\phi \Vdash_{x_1,\ldots,x_m} \texttt{true}))$

$$[\![\textit{his}]\!]_{\mathcal{M}} = \texttt{his} \colon (E \to T) \to \mathbf{D}\, E\, E$$
$$:= (\lambda P, c.(c(\mathbf{have}(x g g)\mathbf{t} + P x) = \texttt{true} \Vdash_x x))$$

$[\![\textit{if Theo has a sister he will bring his wetsuit}]\!]$

$$= \mu_{\mathbf{D}\, E, \epsilon}((\texttt{if} \triangleright [\![\textit{Theo has a sister}]\!]_{\mathcal{M}})$$
$$\triangleright^* ((\lambda x. x^{\overset{\uparrow}{\mathbf{D}}})^{\overset{\uparrow}{\mathbf{D}}} \overset{\mathbf{D}}{\underset{E}{\downarrow}} [\![\textit{he will bring his wetsuit}]\!]_{\mathcal{M}}))$$

$$= (\lambda c.(c(\lambda g.\{g \mid \mathbf{have}(x g g)\mathbf{t} \wedge \mathbf{wetsuit}(x g g)\}) = \texttt{true}$$
$$\Vdash (\lambda g.\{g \mid \mathbf{has\_sistert} \to \mathbf{bring}(x g g)\mathbf{t}\})))$$

"inverse scope"

- the presupposition trigger *his wetsuit* has taken scope

(2) If Theo is a scuba diver, he will bring his wetsuit.

$$[\![\textit{if Theo is a scuba diver he will bring his wetsuit}]\!]$$

$$= ((\texttt{if} \triangleright [\![\textit{Theo is a scuba diver}]\!]_{\mathcal{M}}) \triangleright [\![\textit{he will bring his wetsuit}]\!]_{\mathcal{M}})$$

$$= (\lambda c.(c(\lambda g.\{g \mid \textbf{divert} \to (\textbf{have}(xgg)\textbf{t} \wedge \textbf{wetsuit}(xgg))\}) = \texttt{true} \\ \Vdash (\lambda g.\{g \mid \textbf{divert} \to \textbf{bring}(xgg)\textbf{t}\})))$$

"surface scope"

May be smoothly integrated with a dynamic semantics for indefinites.

(8) A man walked in. The man sat down.

- second sentence presupposes a man
- presupposition is satisfied by the first sentence

$$[\![\textit{a man walked in}]\!]_{\mathcal{M}} = (\lambda g.\{g' \mid g[1]g' \wedge \mathbf{man} g'_1 \wedge \mathbf{walk} g'_1\})$$

$$[\![\textit{the}]\!]_{\mathcal{M}} = (\lambda P, c.(c(P(\lambda g, g'.g_1)) = \texttt{true} \Vdash (\lambda g, g'.g_1)))$$

$$\begin{aligned}&[\![\textit{the man sat down}]\!]_{\mathcal{M}} \\ &= (\lambda c.(c(\lambda g.\{g \mid \mathbf{man} g_1\}) = \texttt{true} \Vdash (\lambda g.\{g \mid \mathbf{sit} g_1\})))\end{aligned}$$

$$[\![\textit{a man walked in. the man sat down.}]\!]_{\mathcal{M}}$$

$$= [\![\textit{a man walked in}]\!]_{\mathcal{M}}{}^{\overset{\uparrow}{\mathbf{D}}} \;;\; [\![\textit{the man sat down}]\!]_{\mathcal{M}}$$

$$\begin{aligned}
= (\lambda c.(c((\lambda g.\{g' \mid g[1]g' \wedge \mathbf{man}\,g'_1 \wedge \mathbf{walk}\,g'_1\})\\
\Rightarrow (\lambda g.\{g \mid \mathbf{man}\,g_1\})) = \mathtt{true}\\
\Vdash (\lambda g.\{g' \mid g[1]g' \wedge \mathbf{man}\,g_1 \wedge \mathbf{walk}\,g_1 \wedge \mathbf{sit}\,g_1\})))
\end{aligned}$$

$$= (\lambda c.(c\mathtt{true} = \mathtt{true} \Vdash (\lambda g.\{g' \mid g[1]g' \wedge \mathbf{man}\,g_1 \wedge \mathbf{walk}\,g_1 \wedge \mathbf{sit}\,g_1\})))$$

"trivial" presuppositions

Conclusions

Satisfaction accounts and “trapped presupposition triggers”:

- the “proviso problem” (more generally, that of “trapped presupposition triggers”) is **not** an inherent flaw of Heimian accounts of presupposition projection
- the problem disappears once the compositional repertoire is restructured in terms of the operators of a graded monad

Outlook:

- can the same basic technology be integrated with other dynamic semantic frameworks (e.g., de Groote, 2006; Charlow, 2014)?
- can it be modified to handle presupposition accommodation?
  - hybrid account with de Groote and Lebedeva (2010); Lebedeva (2012)?
- the **selection** problem as resolution of scope ambiguity

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