# Presupposition and anaphora:

Van der Sandt (1992) & Krahmer (1998), Ch. 6

**Appetizer: Van der Sandt (1992)**

## Presuppositions: What they are not

Time does not permit us to discuss these possibilities in detail, but presuppositions are not...

- ... referring expressions (á la Frege/Strawson): this is the cumulativity hypothesis.
- ... logical inferences (á la Strawson): relies on a monotonic definition of entailment, which fails because presuppositions are non-monotonic.
- ... pragmatic phenomenon (á la Stalnaker/70s fashion): relies on separation of semantic and pragmatic content, which leads to problems when the two interact.

## Presuppositions as anaphora

Presuppositions are just anaphors. They differ from pronouns (and other anaphoric expressions) in two respects:

ONE: presuppositions contain descriptive content that enables them to accommodate an antecedent in case the discourse does not provide one.

TWO: presuppositions have internal structure of their own (e.g. they can contain free variables, can be incomplete [and thus bound by external quantifiers], ?etc.?).

**Claim:** presupposition projection and anaphora resolution should not be handled by separate mechanisms.

### Anaphora resolution and presupposition projection

(1) (Lack of) Presupposition projection:

a. Jack has children, and *all of Jack's children* are bald.

b. If Jack has children, then *all of Jack's children* are bald.

c. Either Jack has no children or *all of Jack's children* are bald.

(2) Anaphora resolution:

   a. John owns a donkey. He beats it.
   b. If John owns a donkey, he beats it.
   c. Either John does not own a donkey or he beats it.

Notice, we can easily change the "category" of the examples in (1) and (2), suggesting a similar mechanisms underlying both pronoun resolution and presuppositional filtering:

(3) If Jack has children, then they are bald.

(4) If John owns a donkey, he beats *his donkey*.

- Rather than saying presuppositions are suspended, cancelled, or neutralized, we should say they are *linked up* or *bound* to a previously established antecedent (just like pronouns!).
- If a semantically empty anaphor does not succeed in finding an antecedent, then it will not get a determinate value.
- Presuppositions are not semantically empty (they are filled with descriptive content)
- Presuppositions usually have enough descriptive content to establish an antecedent if the discourse does not provide one ⇒ this is accommodation.

**Accommodation**

An observation: accommodation normally takes place with respect to the context established by the previous discourse.

- In DRT terms, this means the antecedent will preferably be accommodated at the top level of discourse structure.
- This captures the intuition that presuppositions constitute information "taken for granted" and are generally entailed by the matrix sentence.[1]
- Note that certain pragmatic principles may force accommodation at a subordinate level.

*Presupposition projection* is when the lexical information of a presupposition has been accommodated at some level of the discourse structure.

- *Neutralization* or presupposition satisfaction is basically anaphoric binding at some level of representation.

[1]Unless, of course, they are filtered, canceled, or neutralized.

## Elaborating on two points

**Point one** concerns the difference between anaphoric binding as described and Karttunen & Heim's contextual satisfaction.

- Satisfaction predicts the first possible antecedent will be chosen and will result in neutralization of the presupposition.
- The anaphoric account predicts ambiguity among antecedents– we can "choose" between antecedents or choose between binding & or accommodating.

(5) If John has grandchildren, *his children* must be happy.

- Cannot be bound– "grandchildren" is not actually a proper antecedent.
- Instead, it must be accommodated...
  Globally: the presupposing interpretation
  Locally: the non-presupposing interpretation

(6) If John has a Spanish girlfriend, his girlfriend won't be happy.

(7) If John has a Spanish girlfriend, his girlfriend won't be happy, but if he has one from France...

- Here, the presupposition can be resolved (=bound) in the antecedent, but need not be.
- The second example is supposed to eliminate the presupposing reading (= the accommodation reading)

**Point two** is about the testability of the claim that presupposition is a species of anaphora.

- Accommodation creates a dref, gives it the descriptive material associated with the presuppositional expression, and thus creates an accessible antecedent.
- If accommodation is global (at the top level), then this creates a discourse marker which can be an antecedent for future anaphors.

(8) If John has a Spanish girlfriend, his girlfriend won't be happy. She has always been rather jealous.

(9) If the problem was solved at the conference, it was Julius who solved it. But whether he did or not, the solution was brilliant anyway.

**Main Course: Krahmer (1998), Ch. 6**

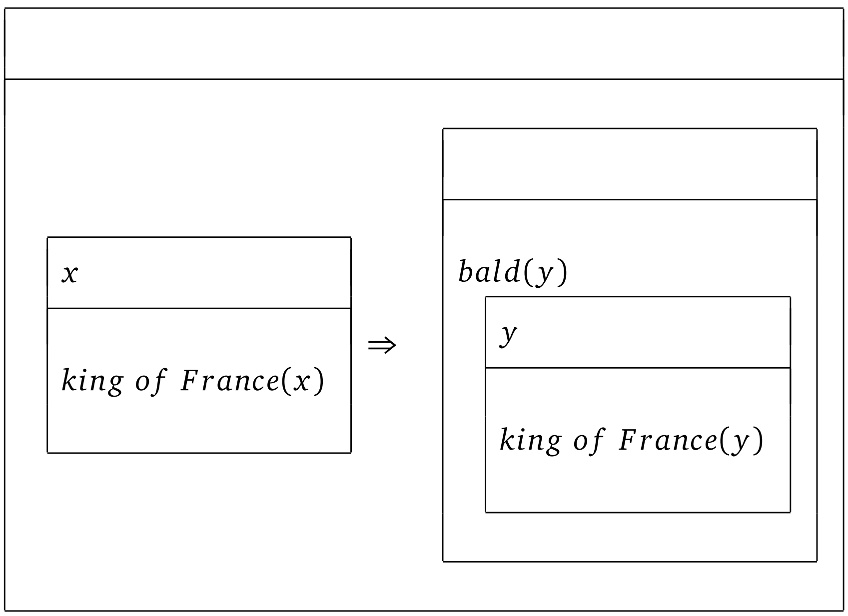
## Presuppositions-as-Anaphors, part deux

In Van der Sandt's approach, anaphors are not realized as part of the construction algorithms, resulting in an S-DRS.

- An S-DRS is essentially a standard DRS with embedded elementary presuppositions awaiting resolution, embedded as S-DRSs themselves.

(10) If France has a king, then the king of France is bald.

(11)




In the above DRS, the box including king of france (y) is the presuppositional DRS.

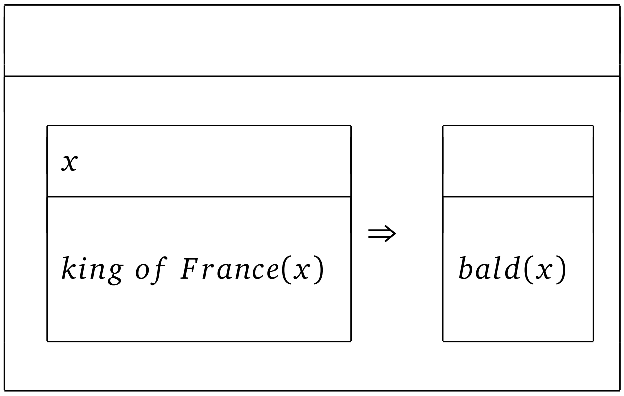
### Resolving presuppositions

**One: try to bind as low as possible**

Find a suitable (= satisfies the conditions of the presuppositional DRS), accessible (as defined so far) antecedent, and...

- Remove it from the DRS where it originates (= the *source* DRS),
- Move it to the DRS where the binding antecedent is located (= the *target* DRS),
- Replace free occurrences of variables in the presupposition with its antecedent's variable.
- The lowest/closest antecedent is determined by the *projection line*– the list of (sub-)DRSs encountered in calculating the accessible antecedents.

(12)




This is the result of binding the presupposition in (11).

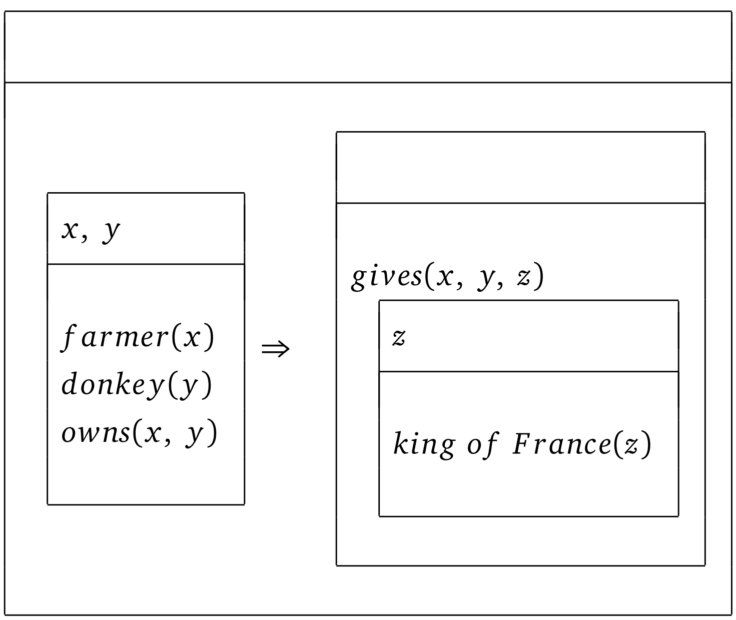
**Two: If binding fails, then try to accommodate as high as possible**

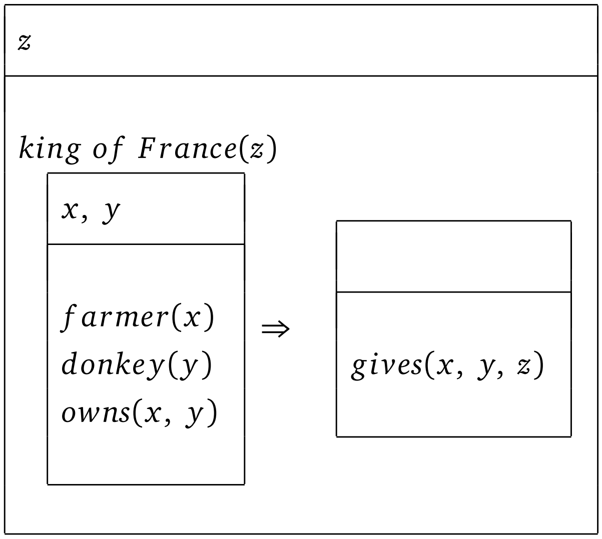
Accommodation of a presuppositional DRS $\Phi$ in some target-DRS $\Psi$ amounts to adding $\Phi$ to $\Psi$. (i.e. replace $\Psi$ with $\Phi$ ; $\Psi$)

- Global accommodation: accommodation in the main DRS
- Intermediate accommodation: accommodation lower on the projection line than the main DRS.
- Local accommodation: accommodation in the source-DRS

(13) If a farmer owns a donkey, he gives it to the king of France.

(14)



(15) 


Accommodation is subject to certain constraints:

- *Trapping constraint*: variables may not end up being free after accommodation.
- *Informativity*: The set of models which support Φ' (the output of accommodation) is a proper subset of the set of models supporting Φ.
- *Consistency*: There is at least one model satisfying Φ'.

**Three: If both binding and accommodation fail: Begin to weep softly**

For example, this happens in the example below:

(16) There is no king of France. # The king of France is bald.

The antecedent in the first sentence is *not* accessible, and accommodation would violate consistency.

## Q: What is a presuppositional DRS?

There is no interpretation for S-DRSs. There are two possible options...

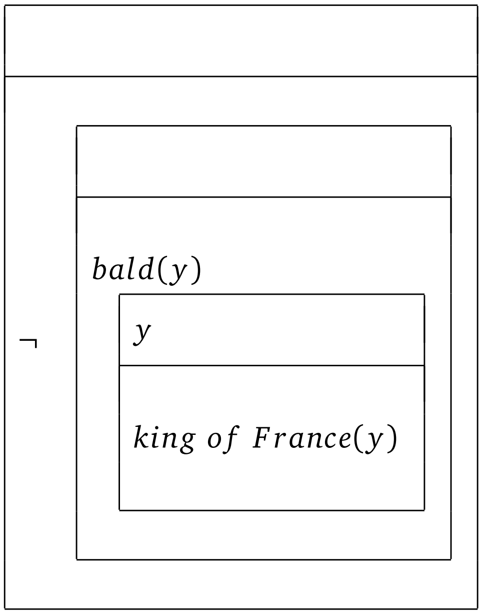
- One: S-DRSs are like proto-DRSs that are still under construction, but they are not elements of the proper DRT language and thus do not require interpretation.
- Two (Krahmer's choice): Treat S-DRSs like ordinary DRSs that require an interpretation.

Choosing option two allows Krahmer to avoid the substantial backtracking (e.g. when checking for properties like entailment or consistency) that comes as a result of having no interpretation for S-DRSs.

## Accommodating failing presuppositions

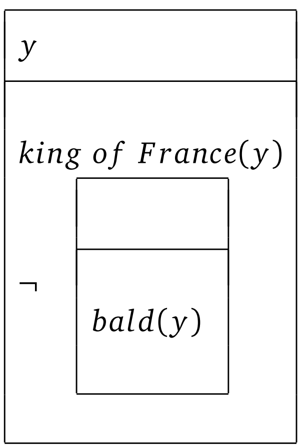
(17) It is not the case that the king of France is bald.

(18)



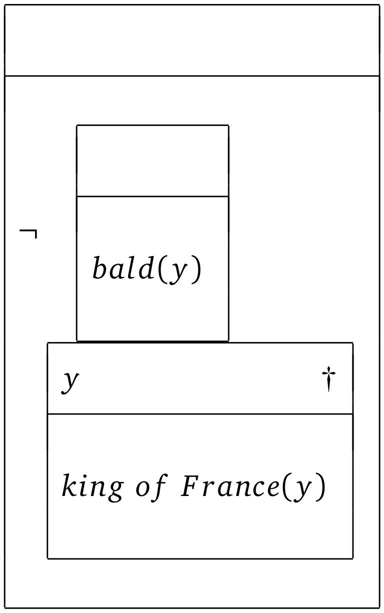

This DRS is resolved in Van der Sandt's theory by accommodation, yielding the DRS below:

(19)




In a model where France has no king, the DRS above is false, as the presupposition loses its "presuppositionhood" after resolution. Instead, Krahmer proposes to accommodate presuppositional DRSs *as presuppositional* DRSs, marking them with † to indicate they have been resolved:

(20)




Interpretation of presuppositional DRSs is just a dynamic version of Blamey's transplication (where the entire DRS will be N unless the presupposition is true.

## Disjunctions

Van der Sandt's theory makes incorrect predictions when it comes to disjunctions as a result of the fact that his assumptions are cashed out in standard DRT.

(21) Either there is no bathroom in this house, or the bathroom is in a strange place.

- The presupposition that there is a bathroom cannot be bound by anything in the left disjunct, as left disjuncts are not accessible in standard DRT.
- It cannot be accommodated in the matrix DRS because it is inconsistent with the left disjunct.
- So, we locally accommodate it, resulting in a reading like *Either there is no bathroom in this house, or there is a bathroom in this house, and it is in a strange place*.
- If there are two bathrooms, (21) does not seem to be true, but under the Van der Sandt reading, it is true because the second disjunct can be verified.

However, if we return to Double Negation DRT, everything works out.

- Now, negated left disjuncts are accessible from the right disjunct.
- Rather than accommodating, we can bind the presupposition in the right disjunct, which yields the non-presuppositional reading.

## Presupposition-Quantification Interaction

(22) Every fat man pushes his bicycle.

(23) Every fat man who has a bicycle pushes it.

Van der Sandt predicts that these would be equivalent, but that equivalence is generally not supported.

- The presupposition triggered by *his bicycle* is incorporated in the scope of *every*.
- It cannot be globally accommodated because the dref associated with *his* would end up free, a violation of the trapping constraint.
- The assumption that presuppositions should be accommodated as presuppositions and not assertions may shed new light on these examples.

**Break time**

## Presuppositional DRT

- It's Double Negation DRT, but with representations for elementary presuppositions.
- Def 1, p. 162 (Syntax): Same as DN-DRT, but with the unary presupposition operator $\partial$.
- Def 2, p. 163 (Semantics): Also similar, but note:

  7. $[\![\partial\Phi]\!]^+ = [\![\Phi]\!]^+$ ($\partial\Phi$ is true whenever $\Phi$ is.)
     $[\![\partial\Phi]\!]^- = \emptyset$ ($\partial\Phi$ cannot be false, only undefined.)

- Def 3, p. 163 (DEF)
  - DRS $\Phi$ is 'dynamically defined' in $M$ w.r.t. $g$ iff $\exists h \langle g,h\rangle \in ([\![\Phi]\!]^+$ or $[\![\Phi]\!]^-)$
- Def 4, p. 164 (Truth combinations): True, False, and Neither
  - No DRS is both True and False
  - A DRS with no presuppositions is either True or False.
- Def 5, p. 164 (Abbreviations):

| | | | |
|---|---|---|---|
| $\Phi_{\langle\Psi\rangle}$ | means | $\partial(\Psi)\ ;\ \Phi$ | (Dynamic transplication) |
| $\Phi \vee \Psi$ | means | $\sim\Phi \Rightarrow \Psi$ | |
| $\top$ | means | $[\ \mid c \equiv c\ ]$, for some $c \in$ Con | |
| $\bot$ | means | $\sim\top$ | |
| $\star$ | means | $\partial\bot$ | (Undefined) |

- Here's the interpretation for $\Phi_{\langle\Psi\rangle}$:

  $[\![\Phi_{\langle\Psi\rangle}]\!]^+ = \langle g,h\rangle \mid \exists k(\langle g,k\rangle \in [\![\Psi]\!]^+ \& \ \langle k,h\rangle \in [\![\Phi]\!]^+)$
  $[\![\Phi_{\langle\Psi\rangle}]\!]^- = \langle g,g\rangle \mid \exists k(\langle g,k\rangle \in [\![\Psi]\!]^+ \& \ \forall k(\langle g,k\rangle \in [\![\Psi]\!]^+ \Rightarrow \exists h \langle k,h\rangle \in [\![\Phi]\!]^-)$
  - $\partial\Psi$ must be True for the whole expression to be either True or False.
- Fact 1, p. 165 (Equivalences):

  1. $\sim\sim\Phi$ is equivalent with $\Phi$ (Dynamic double negation holds.)
  4. $\Phi_{\langle \pi_{1\langle\pi_2\rangle}\rangle}$ is equivalent with $\Phi_{\langle\pi_2;\pi_1\rangle}$ (Nested presuppositions can be rewritten.)

- Def 6, p. 165 (Active and passive DRs): Familiar, with the additions below:

  4. ADR($\partial\Phi$) = ADR($\Phi$)
     PDR($\partial\Phi$) = $\emptyset$ (A presuppositional DRS lacks passive DRs.)

- Def 7, p. 166 (Accessibility):

  5. If ACC($\partial\Phi$) = $X$, then ACC($\Phi$) = $X$
  6. If ACC($\Phi_{\langle\Psi\rangle}$) = $X$, then ACC($\Psi$) = $X$ and ACC($\Phi$) = $X \cup ADR(\Psi)$

  - So $\Phi_{\langle\Psi\rangle}$, $\partial\Psi;\Phi$, and $\Psi;\Phi$ have the same accessibility.

- Fact 2, p. 166 (Merging Lemma): Restricted because of presuppositions.
  - You can only merge if the first DRS is presuppositionless.

## Presuppositional DRT in action

- Van der Sandt built bottom up, we will follow the DRT tradition and build top down.
- New rule for definite descriptions (p. 167):

(24) $$\partial \begin{array}{|l|}\hline x \\ \hline man(x) \\ \hline\end{array}$$

- Equivalent to rule for indefinites, but presuppositional.
- (Eventually, all definite NPs will be treated this way, but that's not my job.)
- Question: Uniqueness?

**Example 1** "The king with the wig ruled."

(DRS 10) [ | ] ; [ The king with the wig ruled. ] $\Leftrightarrow$

[ | ] ; $\partial$[ $x$ | $x$ king with the wig ] ; [ | ruled($x$) ] $\Leftrightarrow$

(DRS 12) $\partial$($\partial$[ $y$ | wig($y$) ] ; [ $x$ | king($x$), with($x, y$) ]) ; [ | ruled($x$) ]

**The point:** It's presuppositions all the way down (or could be).

**Example 2** "A fat man pushes his bicycle. It is broken."

(DRS 14) [ | ] ; [ A fat man pushes his bicycle ] $\Leftrightarrow$

[ $x$ | fat-man($x$) ] ; $\partial$[ $y$ | bike($y$), of($x, y$) ] ; [ | push($x, y$) ]

- We want to add [ It is broken ], but is $y$ accessible to *it*? *(Def 6 & 7, p. 165–6.)*
  ACC([ It is broken ]) =
  ADR([ $x$ | fat-man($x$) ] $\cup$ ADR($\partial$[ $y$ | bike($y$), of($x, y$) ]) $\cup$ ADR([ | push($x, y$) ]) =
  $\{x\}$ $\cup$ ADR([ $y$ | bike($y$), of($x, y$) ]) $\cup$ $\emptyset$ =
  $\{x, y\}$
- Yes. The final product:

(DRS 18′) [ $x$ | fat-man($x$) ] ; $\partial$[ $y$ | bike($y$), of($x, y$) ] ; [ | push($x, y$) ] ; [ | broken($y$) ]

**The point:** Pronouns can be bound by discourse referents introduced by presuppositions.

**Example 3** "Every man who serves his king will be rewarded by him."

- While under construction...

(DRS 19) $[\ |\ [\ x \mid \text{man}(x)\ ]\ ;\ \partial[\ y \mid \text{king}(y), \text{of}(x,y)\ ]\ ;\ [\ \mid \text{serves}(x,y)\ ] \Rightarrow$
$[\ x$ rewarded by him $]]$

- This is a donkey sentence. Is $y$ accessible to *him*? *(Def 6 & 7, p. 165–6.)*
  $\text{ACC}([\ x$ rewarded by him $]) =$
  $\text{ADR}([\ x \mid \text{man}(x)\ ]\ ;\ \partial[\ y \mid \text{king}(y), \text{of}(x,y)\ ]\ ;\ [\ \mid \text{serves}(x,y)\ ]) =$
  $\text{ADR}([\ x \mid \text{man}(x)\ ] \cup \text{ADR}(\partial[\ y \mid \text{king}(y), \text{of}(x,y)\ ]) \cup \text{ADR}([\ \mid \text{serves}(x,y)\ ]) =$
  $\{x\} \cup \text{ADR}([\ y \mid \text{king}(y), \text{of}(x,y)\ ]) \cup \emptyset =$
  $x, y$
- Yes. Again, the final product:

(DRS 20) $[\ |\ [\ x \mid \text{man}(x)\ ]\ ;\ \partial[\ y \mid \text{king}(y), \text{of}(x,y)\ ]\ ;\ [\ \mid \text{serves}(x,y)\ ] \Rightarrow [\ \mid \text{reward}(y,x)\ ]]$

**The point:** Discourse referents introduced by presuppositions of the antecedent can bind into the consequent.

- But what is actually presupposed by (DRS 18′) and (DRS 20)?
  - Van der Sandt: Nothing. The presuppositions are 'trapped.'
  - Krahmer: See below.

## Determining semantic prepositions

- System supports two options:
  1. Van der Sandt-style presupposition resolution.
  2. Presupposition interpretation by computing weakest existential preconditions (WEP).
- $\text{WEP}^{-}$calculus takes a DRS, returns a PL formula that's true when the DRS is true ($\text{WEP}^{+}$) or false ($\text{WEP}^{-}$).
- Def 8, p. 173 ($\text{WEP}^{-}$calculus): There's a lot of stuff going on, but little is new.
  6. $\text{WEP}^{+}(\partial\Phi, \chi) = \text{WEP}^{+}(\Phi, \chi)$
     $\text{WEP}^{-}(\partial\Phi, \chi) = \text{WEP}^{+}(\top, \chi)$, where $\top$ is $[\ \mid c \equiv c\ ]$
  - A presuppositional DRS can never be rejected.

**Example 5** "The king sings."

(DRS 21) $\partial[\ x \mid \text{king}(x)\ ]\ ;\ [\ \mid \text{sing}(x)\ ]$

- Let's calculate some WEPs. (DRS 21) is true when...

a. $\text{WEP}^+(\partial[\ x \mid \text{king}(x)\ ]\ ;\ [\ \mid \text{sing}(x)\ ], \top) \Leftrightarrow$

b. $\text{WEP}^+(\partial[\ x \mid \text{king}(x)\ ], \text{WEP}^+([\ \mid \text{sing}(x)\ ], \top)) \Leftrightarrow$

c. $\text{WEP}^+([\ x \mid \text{king}(x)\ ], \text{WEP}^+([\ \mid \text{sing}(x)\ ], \top)) \Leftrightarrow$

d. $\exists x(\text{TR}^+(\text{king}(x) \wedge \text{WEP}^+([\ \mid \text{sing}(x)\ ], \top)) \Leftrightarrow$

e. $\exists x(\text{TR}^+(\text{king}(x) \wedge \text{TR}^+(\text{sing}(x)) \wedge \top \Leftrightarrow$

f. $\exists x\mathbf{(king(}x\mathbf{)} \wedge \mathbf{sing(}x\mathbf{))}$

- And (DRS 21) is false when...

a. $\text{WEP}^-(\partial[\ x \mid \text{king}(x)\ ]\ ;\ [\ \mid \text{sing}(x)\ ], \top) \Leftrightarrow$

b. $\neg\text{WEP}^+(\partial[\ x \mid \text{king}(x)\ ], \neg\text{WEP}^-(\ [\ \mid \text{sing}(x)\ ], \top)) \wedge \overline{DEF}(\partial[\ x \mid \text{king}(x)\ ]) \wedge \top \Leftrightarrow$

c. $\neg\text{WEP}^+([\ \text{x} \mid \text{king(x)}\ ], \neg\text{WEP}^-(\ [\ \mid \text{sing}(x)\ ], \top)) \wedge$
$\text{WEP}^+(\partial[\ x \mid \text{king}(x)\ ], \top) \vee \text{WEP}^-(\partial[\ x \mid \text{king}(x)\ ], \top) \Leftrightarrow$

d. $\neg\exists x(\text{TR}^+(\text{king}(x)) \wedge \neg\ (\text{TR}^-([\ \mid \text{sing}(x)\ ]) \wedge \top) \wedge$
$\text{WEP}^+([\ x \mid \text{king}(x)\ ], \top) \vee \text{WEP}^-(\top, \top) \Leftrightarrow$

e. $\neg\exists x(\text{king}(x) \wedge \neg\neg\ \text{sing}(x)) \wedge \exists x(\text{king}(x)) \Leftrightarrow$

f. $\forall x\mathbf{(king(}x\mathbf{)} \rightarrow \neg\ \mathbf{sing(}x\mathbf{))} \wedge \exists x\mathbf{(king(}x\mathbf{)}$

- Let $\text{PS}(\Phi) = \text{WEP}^+(\Phi) \vee \text{WEP}^-(\Phi)$.

  $\text{PS}(\text{DRS } 21) = (\underline{\exists x(\text{king}(x)} \wedge \text{sing}(x))) \vee (\forall x(\text{king}(x) \rightarrow \neg\ \text{sing}(x)) \wedge \underline{\exists x(\text{king}(x}))$

- Fact 5, p. 174: $\Phi$ presupposes PR($\Phi$), for any DRS.
  - Whenever PR($\Phi$) is true, $\Phi$ is defined.
- Fact 6, p. 175 (Presupposition projection):
  - The expected behavior: Negation is a hole, $\partial\Phi$ presupposed truth of $\Phi$.
  - PR of an atomic DRS = existential truth-condition $\vee$ universal falsity condition.
  - If $\Phi$ triggers no presuppositions, then $\text{PR}(\Phi_{\langle\Psi\rangle}) \Leftrightarrow \text{WEP}^+(\Psi, \top)$

**Example 1′** "The king with the wig ruled"

$\partial(\partial[\ y \mid \text{wig}(y)\ ]\ ;\ [\ x \mid \text{king}(x), \text{with}(x,y)\ ])\ ;\ [\ \mid \text{ruled}(x)\ ]$

- What's the semantic presupposition of this?

  $\text{PR}(\partial(\partial[\ y \mid \text{wig}(y)\ ]\ ;\ [\ x \mid \text{king}(x), \text{with}(x,y)\ ])\ ;\ [\ \mid \text{ruled}(x)\ ]) \Leftrightarrow$

  $\text{WEP}^{+}(\partial(\partial[\ y \mid \text{wig}(y)\ ]\ ;\ [\ x \mid \text{king}(x), \text{with}(x,y)\ ]), \top) \Leftrightarrow$

  $\text{WEP}^{+}(\partial[\ y \mid \text{wig}(y)\ ], \text{WEP}^{+}([\ x \mid \text{king}(x), \text{with}(x,y)\ ], \top) \Leftrightarrow$

  $\exists y(\text{wig}(y) \wedge \exists x(\text{king}(x) \wedge \text{with}(x,y)))$

**Example 2′** "A fat man pushes his bicycle"

$\text{PR}([\ x \mid \text{fat-man}(x)\ ]\ ;\ \partial[\ y \mid \text{bike-of}(y,x)\ ]\ ;\ [\ \mid \text{push}(x,y)\ ]) \Leftrightarrow$

$\text{WEP}^{+}([\ x \mid \text{fat-man}(x)\ ]\ ;\ \partial[\ y \mid \text{bike-of}(y,x)\ ]\ ;\ [\ \mid \text{push}(x,y)\ ]) \vee$

$\qquad \text{WEP}^{-}([\ x \mid \text{fat-man}(x)\ ]\ ;\ \partial[\ y \mid \text{bike-of}(y,x)\ ]\ ;\ [\ \mid \text{push}(x,y)\ ]) \Leftrightarrow$

$\exists x(\text{fat-man}(x) \wedge \exists y(\text{bike-of}(y,x) \wedge \text{push}(x,y))) \vee$

$\qquad \forall x(\text{fat-man}(x) \rightarrow \exists y(\text{bike-of}(y,x) \wedge \forall y(\text{bike-of}(y,x) \rightarrow \neg\text{push}(x,y))))$

- No binding problems, no overly strong presuppositions.

# Again: Presuppositions-as-Anaphors

- Recapping:
  - Presuppositional DRT is just like Double Negation DRT with the $\partial$ operator.
  - Semantics defined in terms of support and rejection, dynamic version of middle Kleene system.
  - Presupposition projection works out about the same in Presuppositional DRT and middle Kleene PPL.
- Syntax of Presuppositional DRT compatible with Van der Sandt's representations, so we can use his presupposition resolution algorithm if we want. What do we gain by using Presuppositional DRT (over standard DRT)?

1. Presuppositional DRSs can be interpreted, so there's less backtracking.
   - Constraints on accommodation can be checked without resolving other presuppositions.
   - Procedural version of algorithm can stop after one success, but doesn't have to.
2. Presuppositional DRSs are 'marked as such,' presupposition failure leads to undefinedness, not falsity:

**Example 6** "It is not the case that the King of France is bald."

- Here's the globally accommodated DRS. Note that the Presuppositional DRS still is.
  $\partial[\ y \mid \mathrm{KoF}(y)\ ]\ ;\ [\ \mid \neg[\ \mid \mathrm{bald}(y)\ ]]$
- What does this semantically presuppose?
  $\mathrm{PR}(\partial[\ y \mid \mathrm{KoF}(y)\ ]\ ;\ [\ \mid \neg[\ \mid \mathrm{bald(y)}\ ]])$
  $\mathrm{WEP}^{+}(\partial[\ y \mid \mathrm{KoF}(y)\ ])$
  $\exists y(\mathrm{KoF}(y))$

3. Standard DRT predicts that the left disjunct is not accessible from the right, but in Double Negation DRT, (and by extension, Presuppositional DRT), the negation of the left disjunct is accessible.
   - "Either there's no bathroom in this house, or the bathroom is in a strange place." $(\sim \Phi \vee \Psi_{\langle \pi \rangle})$
   - "If there's a bathroom in this house, the bathroom is in a strange place." $(\Phi \rightarrow \Psi_{\langle \pi \rangle})$
4. Again because globally accommodated presuppositions are still marked as presuppositional, there is no equivalence between "Every fat man pushes his bicycle" and "Every fat man who has a bicycle pushes it."

# Discussion: Comparing the two approaches

- Two roads to presuppositionville: Calculate $\mathrm{PR}(\Phi)$, or use Van der Sandt's algorithm.
  - One returns presupposition in PL, other returns a new DRS: $\Phi \rightsquigarrow \Phi'$
- Does resolution preserve meaning?
  - We can interpret before and after to find out.
  - If $\mathrm{PR}(\Phi) = \mathrm{PR}(\Phi')$, meaning is preserved.

### Does binding preserve meaning?

- No, because representation before resolution fails to capture insight that $\partial\Phi$ requires an antecedent.

**Example 7** "If France has a king, then the King of France is bald."

- Before resolution: (i.e., $PR(\Phi)$)

DRS 2 $[ \mid [ \, x \mid \text{KoF}(x) \, ] \rightarrow \partial [ \, y \mid \text{KoF}(y) \, ] \, ; [ \mid \text{bald}(y) \, ] \, ]$

$\vdots$ (Extra credit! You do this one.)

$\neg\exists x(\textbf{KoF}(x)) \vee \exists y(\textbf{KoF}(y) \wedge \textbf{bald}(y))$

- After resolution: (i.e., $PR(\Phi')$)

DRS 3 $[ \mid [ \, x \mid \text{KoF}(x) \, ] \rightarrow [ \mid \text{bald}(x) \, ] \, ]$

$\text{WEP}^+([ \mid [ \, x \mid \text{KoF}(x) \, ] \rightarrow [ \mid \text{bald}(x) \, ] \, ], \top) \Leftrightarrow$

$\text{TR}^+( [ \, x \mid \text{KoF}(x) \, ] \rightarrow [ \mid \text{bald}(x) \, ]) \wedge \top \Leftrightarrow$

$\neg\text{WEP}^+( [ \, x \mid \text{KoF}(x) \, ], \neg\text{WEP}^+([ \mid \text{bald}(x) \, ], \top)) \wedge \text{DEF}( [ \, x \mid \text{KoF}(x) \, ]) \Leftrightarrow$

$\neg\exists x(\text{TR}^+(\text{KoF}(x) \wedge \neg\text{TR}^+(\text{bald}(x)) \wedge \top) \Leftrightarrow$

$\forall x(\textbf{Kof}(x) \rightarrow \textbf{bald}(x))$

- Whoops.

- Possible fix: Represent the need for an antecedent.
  - Change definites rule, so the new DR has to be set equal to something.

    $[ \, y \mid \text{king}(y), \, y \equiv ? \, ]$
  - Alternatively, use 'contextual quantification.'

    $C \, [ \, y \mid \text{king}(y) \, ]$, where $C$ = set of accessible DRs (see footnote 27, p. 182)

    $x \, [ \, y \mid \text{king}(y) \, ] = [ \, y \mid \text{king}(y), \, y \equiv x \, ]$

**Does accommodation preserve meaning?**

- No, and adding context sets won't help. (We're creating a DR, not referencing an old one.)
- Compare (13) and (14), p. 5–6 of this handout.
  - Resolved DRS has stronger presupposition—and that's good.
  - Problem lies in the interpretation. (See p. 184–7 for a partial fix.)

**An approach to ponder:** Presupposition projection as proof construction.

- Van der Sandt's accommodation is abductive inference.

This has been a presentation by Mark Norris and Oliver Northrup.