

Semantic Theory

Lecture 9: Presuppositions in DRT

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Presuppositions (Recap)

- Presuppositions are requirements that the context must satisfy for the utterance to be interpretable.
- When a sentence carrying a presupposition is embedded in another sentence, the complete sentence often inherits the presupposition.

(1) *The mathematician who proved Goldbach's conjecture was a woman* » *Someone proved G's conjecture*

(2) *The mathematician who proved Goldbach's conjecture wasn't a woman* » *Someone proved G's conjecture*

(3) *Maybe the mathematician who proved Goldbach's conjecture wasn't a woman* » *Someone proved G's conjecture*

(Examples: Kai von Fintel)

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Presuppositions (Recap)

- Projected presuppositions can be filtered in certain contexts, or cancelled by contextual knowledge.
- **The projection problem** for presuppositions is the problem of predicting the presuppositions of complex sentences from the presuppositions of their parts.

(1) *The king has a son*

(2) *The king's son is bald*

(3) *If the king has a son, the king's son is bald*

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Presuppositions in DRT

- Rob van der Sandt (1992)
 - Presuppositions are anaphora with semantic content.
 - Presupposition filtering is modelled as anaphora binding within a local context (sub-DRS).
 - If a presupposition is not bound, it is accommodated (usually in the top-level DRS).

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Presupposition as Anaphora

- (1) *The chancellor decides*
➤ *There is a chancellor // (s)he decides*
- (2) *John regrets that Mary is married*
➤ *Mary is married // John regrets this*
- (3) *John stopped smoking*
➤ *John used to smoke // he has stopped doing that*
- (4) *It was Peter who ate the cake*
➤ *Somebody ate the cake // Peter did it*

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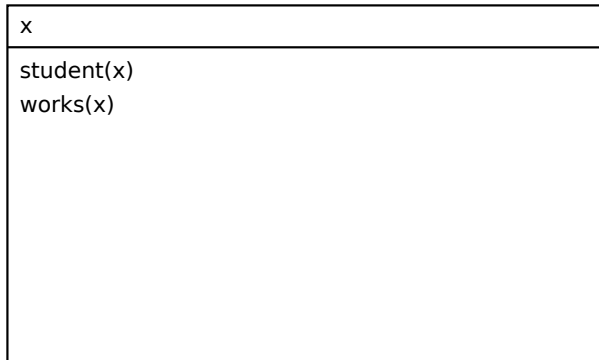
Van der Sandt: Basic Principles

- Introduce “ α -DRSs” as a new type of complex condition
- DRS construction proceeds in two steps:
 - Construction rules for definite noun phrases introduce α -DRSs. This yields a “proto-DRS.”
 - In a second step, the α -DRSs are resolved (translation of a proto-DRS into a standard DRS)
- Resolution: presuppositions can be either **bound** or **accommodated**

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Example: Binding

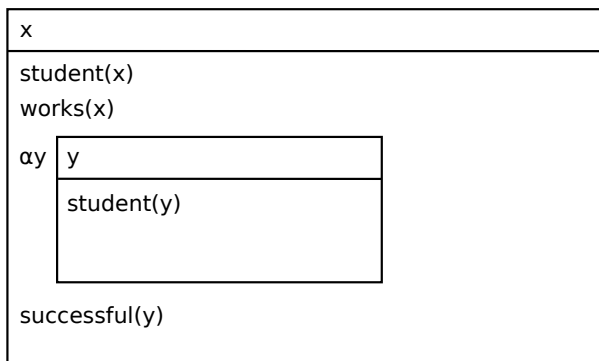
(1) *A student works.*



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Example: Binding

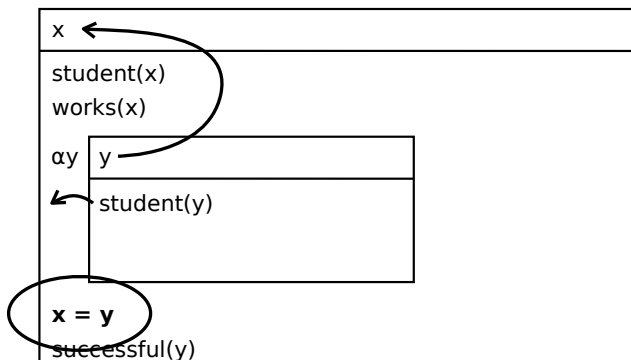
(1) *A student works. The student is successful.*



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Example: Binding

(1) *A student works. The student is successful.*



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Example: Binding

(1) *A student works. The student is successful.*

x y
student(x) works(x) student(y) x = y successful(y)

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Accommodation

- Expressions that trigger presuppositions can often be used even if the context does not satisfy the presupposition.
 - (1) *The king of Buganda is 43*
 - (2) *The movie I saw yesterday was really interesting*
 - (3) *We regret that we have no free rooms available*
- The missing information is silently added to the context (“accommodated”) as we interpret the sentence

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Accommodation

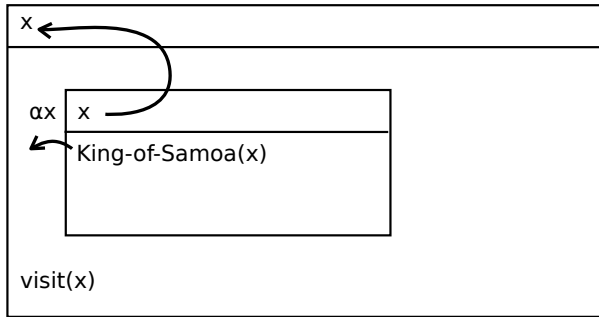
(2) *The King of Samoa is visiting.*

<table border="1"><tr><td>αx x</td></tr><tr><td>King-of-Samoa(x)</td></tr></table>	αx x	King-of-Samoa(x)
αx x		
King-of-Samoa(x)		
visit(x)		

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Accommodation

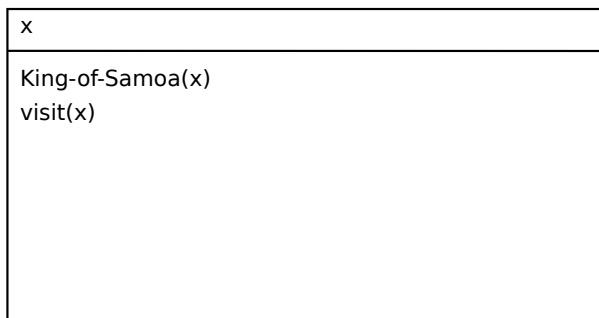
(2) *The King of Samoa is visiting.*



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Accommodation

(2) *The King of Samoa is visiting.*



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DRS-Construction

- A **(proto-) DRS** is a triple $\langle U_K, C_K, A_K \rangle$ such that
 - U_K is a set of discourse referents
 - C_K is a set of (atomic or complex) conditions
 - A_K is a set of “anaphoric” (α -) DRSs of the form $\alpha zK'$, where z is a discourse referent and K' is a proto-DRS.

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Definite Noun Phrases

- The DRS construction rules for all definite noun phrases introduce α -DRSs:

- **Definite descriptions** (“the woman”)

αx	x
	woman(x)

- **Pronouns** (“he”)

αx	x

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Definite Noun Phrases

- The DRS construction rules for all definite noun phrases introduce α -DRSs:

- **Proper names** (“Maria”)

αx	x
	x = Maria

- **Possessives** (“his book”)

αy	y				
	book(y) of(y, z)				
	<table border="1"><tr><td>αz</td><td>z</td></tr><tr><td></td><td></td></tr></table>	αz	z		
αz	z				

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Remark on Proper Names

- Proper names introduce α -DRS like other definite noun phrases.
- In the following examples, we assume (for simplicity) that proper names are treated as in standard DRS

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Subordination

- K_1 is an **immediate sub-DRS** of a DRS $K = \langle U_K, C_K, A_K \rangle$ iff
 - C_K contains a condition of the form $\neg K_1, K_1 \Rightarrow K_2, K_2 \Rightarrow K_1, K_1 \vee K_2, K_2 \vee K_1$
 - or $\alpha x K_1 \in A_K$
- K_1 is a **sub-DRS** of K (notation: $K_1 \leq K$) iff
 - $K_1 = K$ or
 - K_1 is an immediate sub-DRS of K or
 - there is a DRS K_2 such that $K_1 \leq K_2$ and K_2 is an immediate sub-DRS of K .
- K_1 is a **proper sub-DRS** of K iff $K_1 \leq K$ and $K_1 \neq K$.

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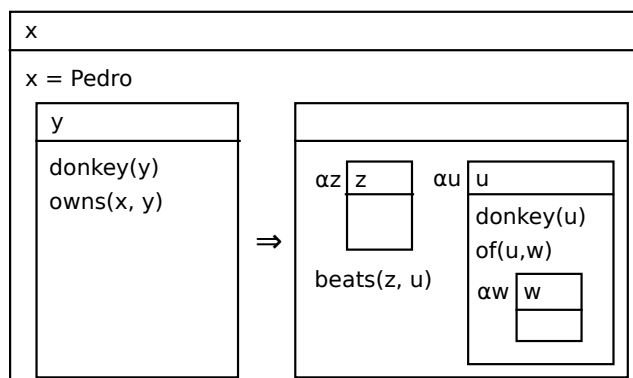
Resolution by Binding

- Let K, K', K_t be some DRSs such that $K' \leq K, K_t \leq K$ and
 - $\gamma = \alpha x K_s \in K', K_s$ is α -free
 - $y \in U_{K_t}$ is a DR that is accessible and suitable for γ
- **Binding:** Remove γ from K' and extend K_t with U_{K_s}, C_{K_s} , and the condition $x = y$.
- Note: Because K_s must be α -free, complex Alpha-DRSs are always resolved from the inside out.

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Resolution by Binding

(3) *If Pedro owns a donkey, he beats his donkey.*



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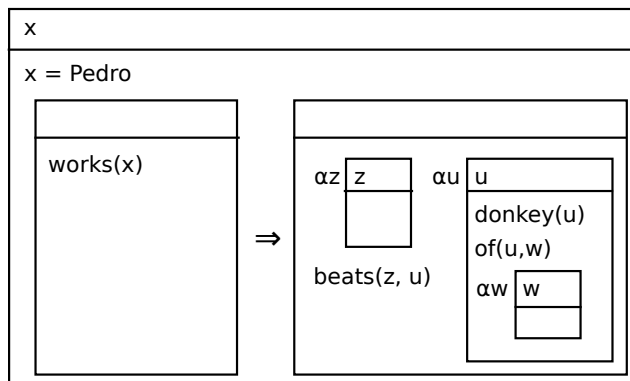
Resolution by Accommodation

- Let K, K' be DRSs such that $K' \leq K, K_t \leq K$ and
 - $\gamma = \alpha x K_s \in K', K_s$ is α -free
 - K_t a DRS that is accessible for γ .
- **Accommodation:** Remove γ from K' and extend K_t with U_{K_s} and C_{K_s} .

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Resolution by Accommodation

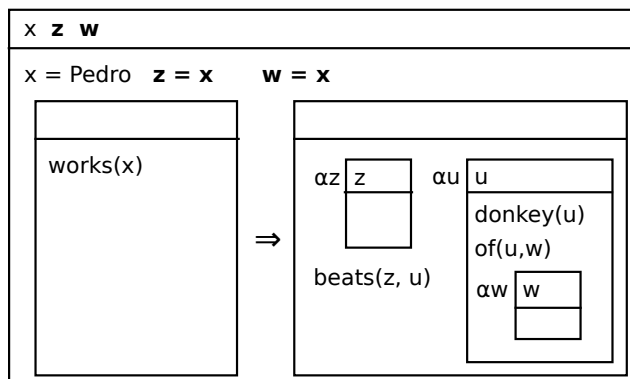
(4) *If Pedro works, he beats his donkey.*



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Resolution by Accommodation

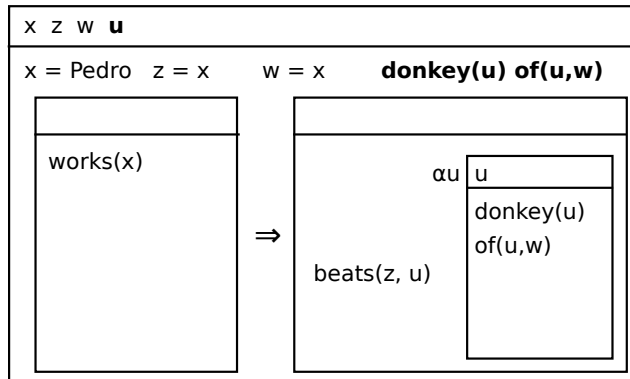
(4) *If Pedro works, he beats his donkey.*



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Resolution by Accommodation

(4) *If Pedro works, he beats his donkey.*



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Preference Principles

- Binding is preferred over accommodation.
- Binding works "upwards" along the accessibility relation: The "closest" possible antecedent is preferred.
- Accommodation works "downwards" along the accessibility relation. It is preferred to accommodate into the highest possible DRS.

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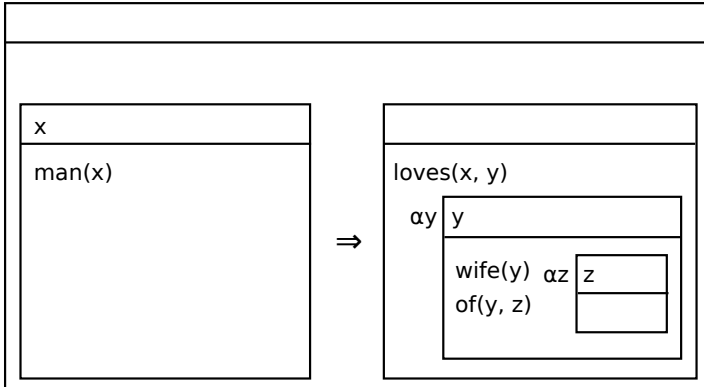
Constraints on Projection

- **Free variable constraint:**
The resolved DRS may not contain any free discourse referents.
- **Consistency and informativity constraints:**
The resolved DRS must be consistent and informative

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Free Variable Constraint

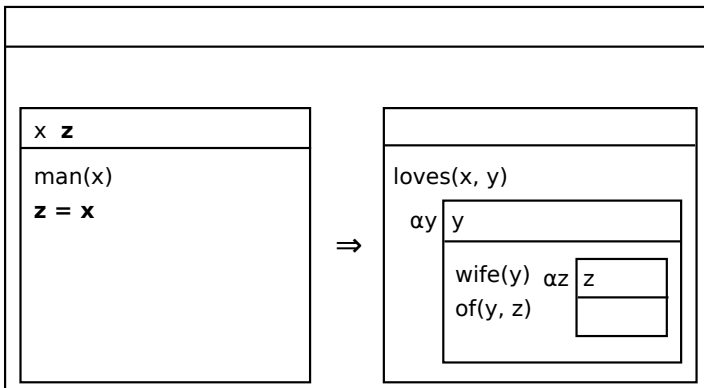
(5) *Every man loves his wife.*



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Free Variable Constraint

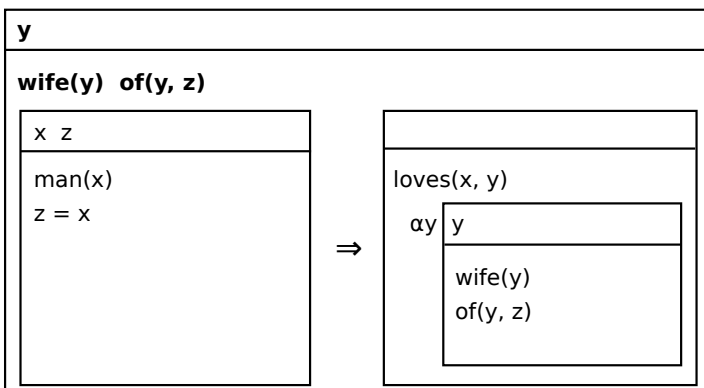
(5) *Every man loves his wife.*



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Free Variable Constraint

(5) *Every man loves his wife.*

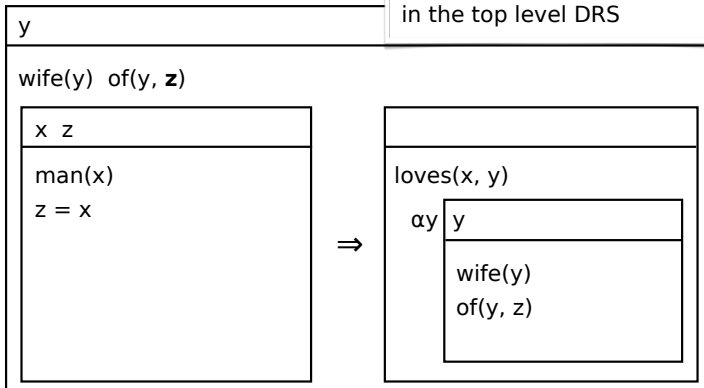


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Free Variable Constraint

(5) *Every man loves his wife.*

Inadmissible resolution:
discourse referent z is free
in the top level DRS

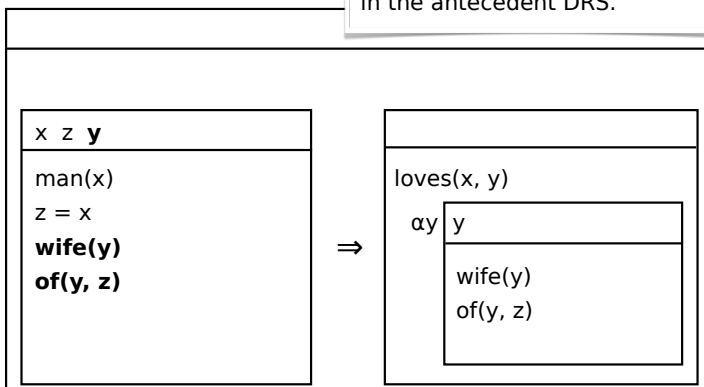


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Free Variable Constraint

(5) *Every man loves his wife.*

Instead: (local) accommodation
in the antecedent DRS.



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Further Constraints

- The resolved DRS must be consistent and informative.
- **Consistency:** The resolved DRS must be satisfiable (taking background knowledge into account).
- **Informativity:** The resolved DRS may not be entailed by our background knowledge.
- **Local consistency:** No sub-DRS must be inconsistent with any superordinate DRS.
- **Local informativity:** No sub-DRS must be entailed by any superordinate DRS.

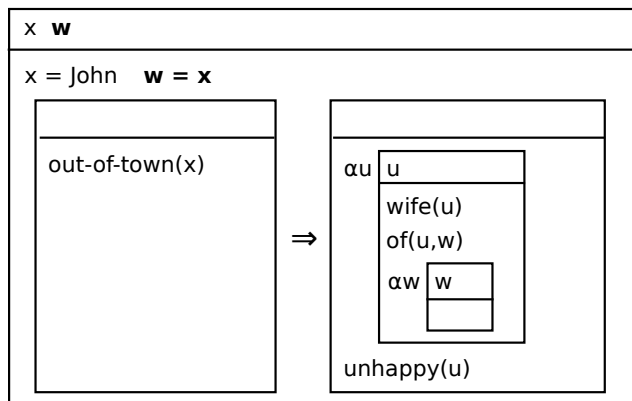
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Presupposition Filtering

- (6) *If John is out of town, his wife is unhappy*
 >> John is married
- (7) *If John is married, his wife is unhappy*
 NOT >> John is married

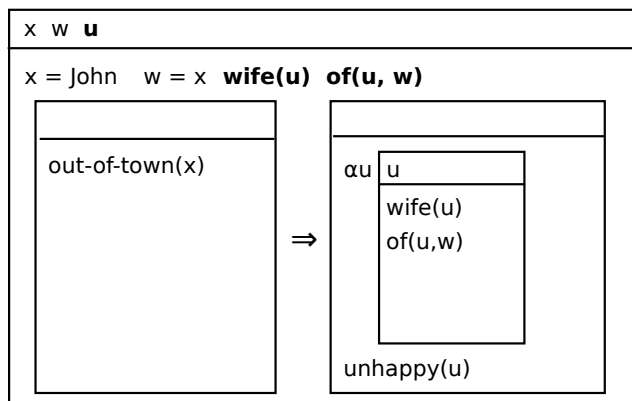
(Local) Informativity

(6) *If John is out of town, his wife is unhappy.*



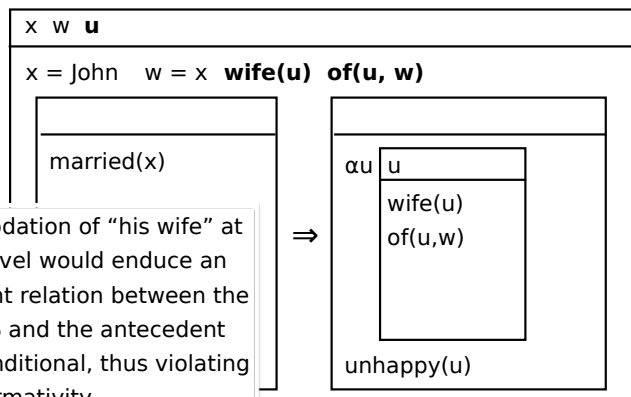
(Local) Informativity

(6) *If John is out of town, his wife is unhappy.*



(Local) Informativity

(7) *If John is married, his wife is unhappy.*

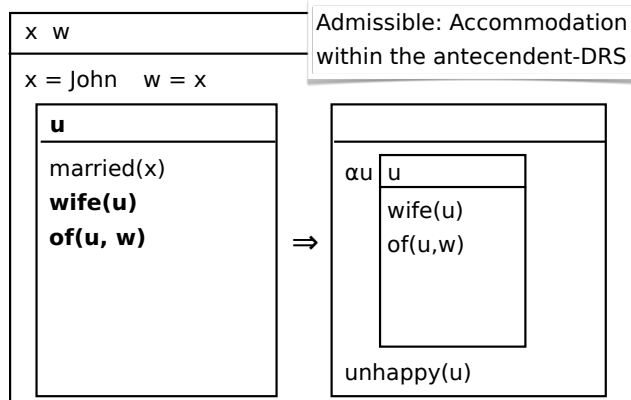


Accommodation of "his wife" at the top level would induce an entailment relation between the main DRS and the antecedent of the conditional, thus violating local informativity.

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(Local) Informativity

(7) *If John is married, his wife is unhappy.*



Admissible: Accommodation within the antecedent-DRS

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Literature

- Rob van der Sandt (1992). Presupposition Projection as Anaphora Resolution, *Journal of Semantics* 9: 333-377

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