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 was**n'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)

Presuppositions (Recap)

- Projected presuppositions can be filtered in certain contexts, or cancelled by contextual knowledge.
- **The projection problem** for presuppostions 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*

Presuppositions in DRT

- Rob van der Sandt's (1992) theory:
  - 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).

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

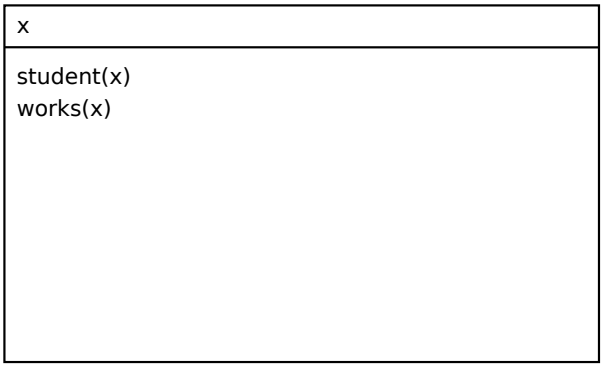
(4) *It was Peter who ate the cake*
≫ Somebody ate the cake // Peter did it

Van der Sandt – Basic Principles

- Introduce "α-DRSs" as a new type of complex condition
- DRS construction proceeds in two steps:
  - The 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**

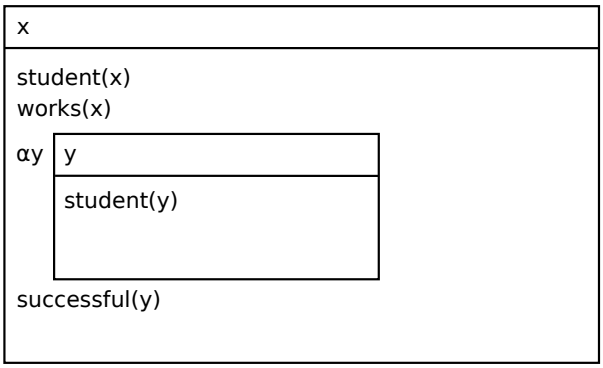
Example – Binding

- *A student works.*



Example – Binding

- *A student works. The student is successful.*



Example – Binding

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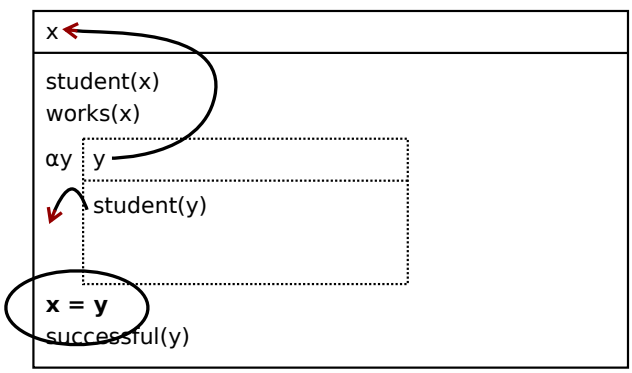


Example – Binding

- *A student works. The student is successful.*

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

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

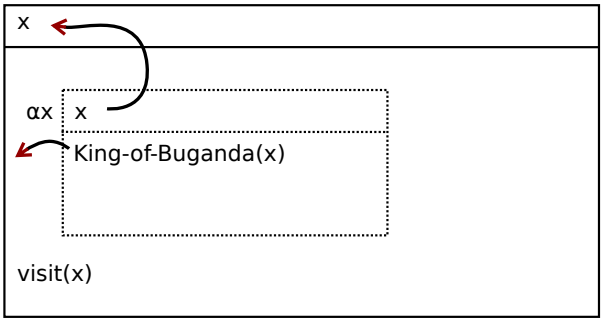
Accommodation

- *The King of Buganda is visiting.*

αx | x King-of-Buganda(x) visit(x)

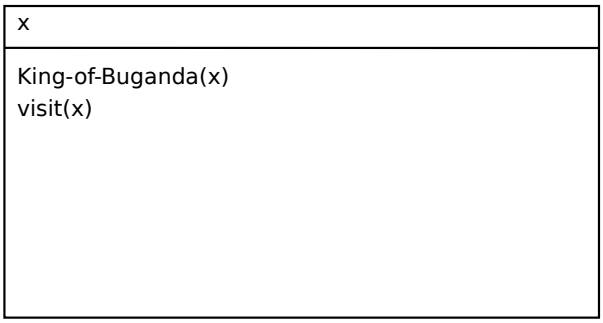
Accommodation

- *The King of Buganda is visiting.*



Accommodation

- *The King of Buganda is visiting.*

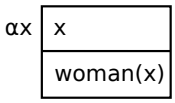


DRS-Construction

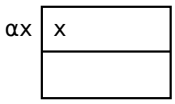
- A **(proto-) DRS** is a triple (U_K, C_K, A_K) such that
  - U_K is a set of discourse referents
  - C_K is a set of (atomic or complex) conditions
  - A_K is a set of "anaphoric" (α-) DRSs of the form αzK', where z is a discourse referent and K' is a proto-DRS.

Definite Noun Phrases

- The DRS construction rules for all definite noun phrases introduce α-DRSs:
- **Definite descriptions** (“the woman”)

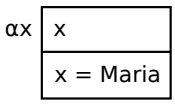


- **Pronouns** (“he”)

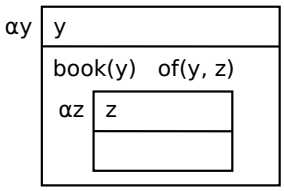


Definite Noun Phrases

- The DRS construction rules for all definite noun phrases introduce α-DRSs:
- **Proper names** (“Maria”)



- **Possessives** (“his book”)



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

Subordination

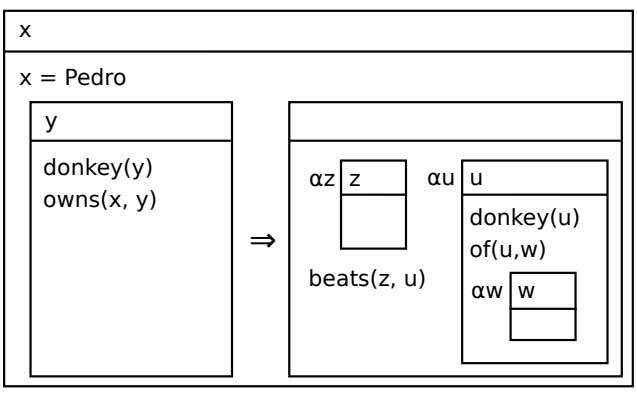
- K_1 is an **immediate sub-DRS** of a DRS $K=\langle U_K, C_K, A_K\rangle$ iff
  - C_K contains a condition of the form $\neg K_1$, $K_1 \Rightarrow K_2$, $K_2 \Rightarrow K_1$, $K_1 \vee K_2$, $K_2 \vee K_1$
  - or $\alpha x K_1 \in A_K$
- K_1 is a **sub-DRS** of K (notation: $K_1 \leq K$) iff
  -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

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

Resolution by Binding

- *If Pedro owns a donkey, he beats his donkey.*



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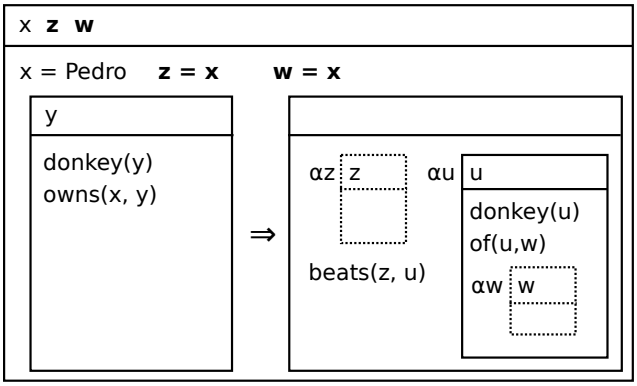

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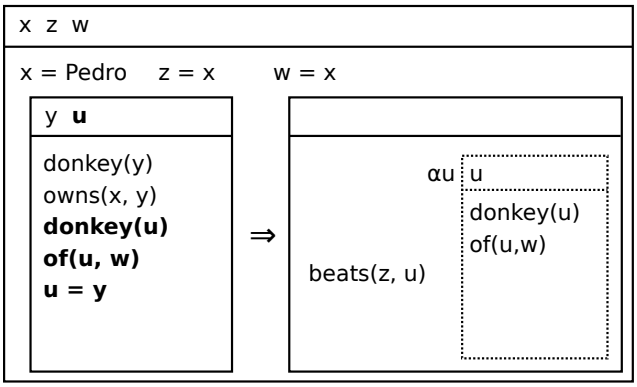

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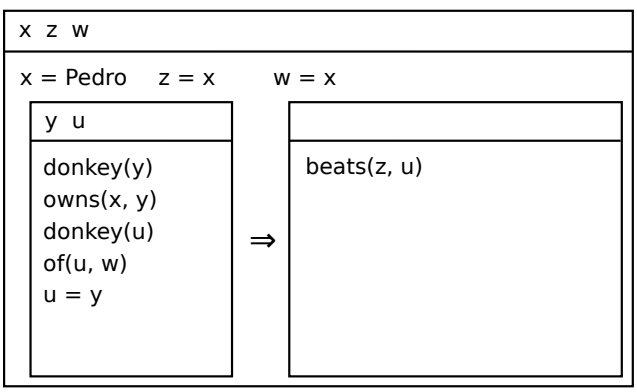
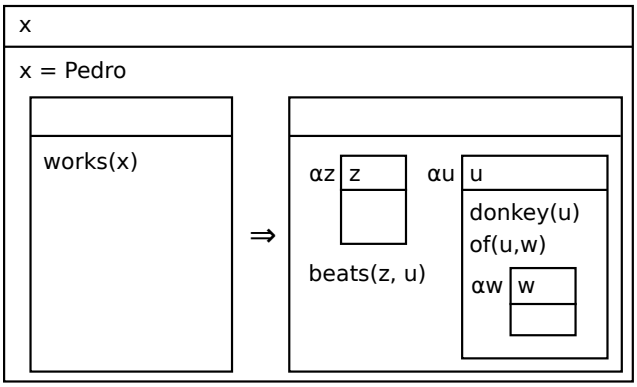


Resolution by Accommodation

- Let K, K’ be DRSs such that K’ ≤ K, K_t ≤ K and
  - γ = αxK_s ∈ 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_{Ks} and C_{Ks}.

Resolution by Accommodation

- *If Pedro works, he beats his donkey.*



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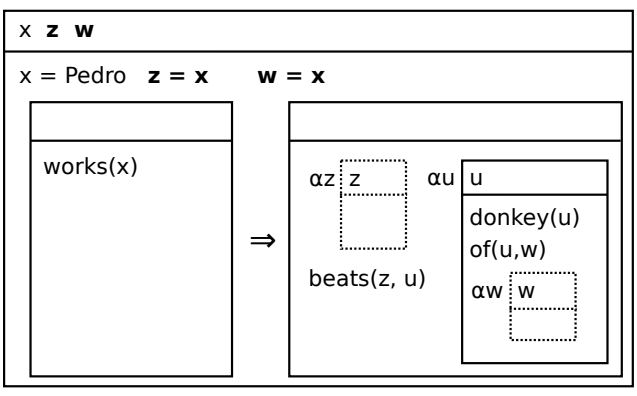

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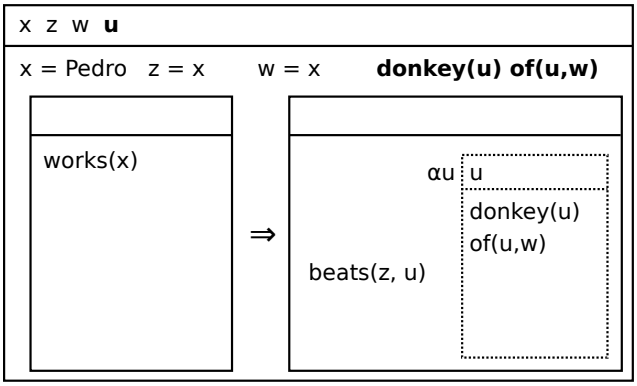


Preference Principles

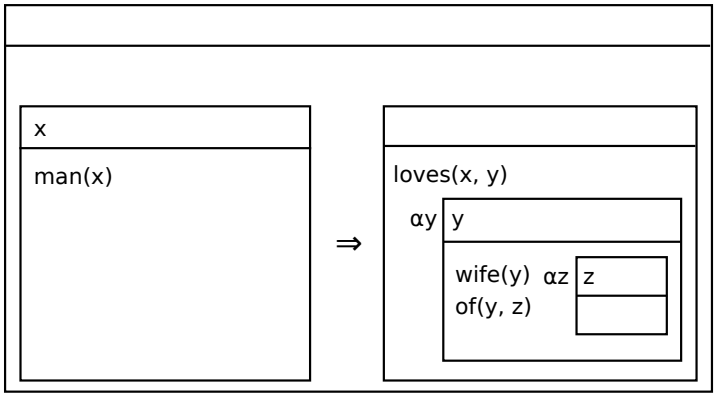
- Binding is preferred over accommodation.
- Binding works “upwards” along the accessibility relation: The “closest” possible antecedent is preferred.
- Accommodation works “downwards” along the accessibility relation. It is preferred to accommodate into the highest possible DRS.

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

Free Variable Constraint

- *Every man loves his wife.*



Free Variable Constraint

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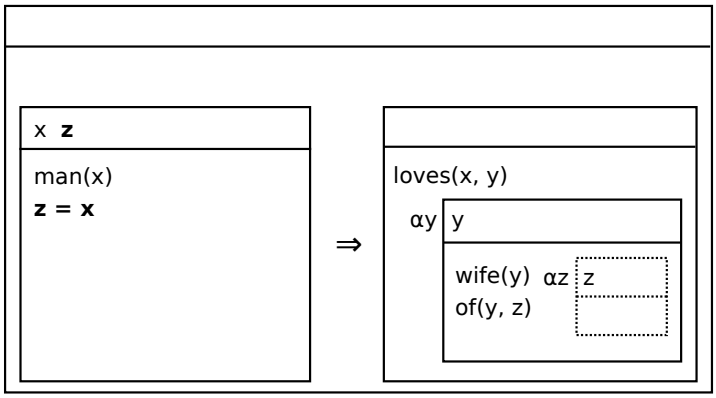

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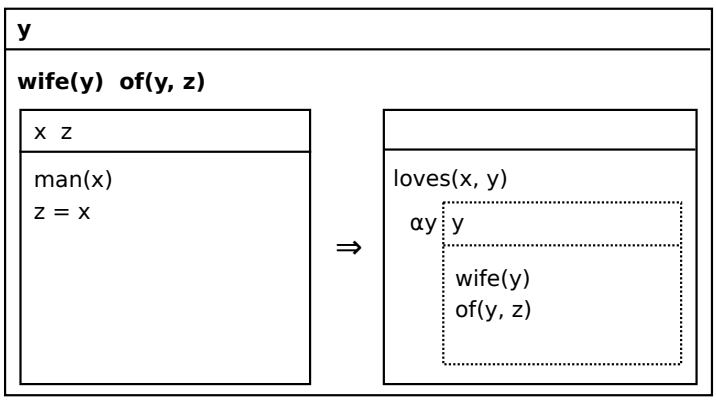
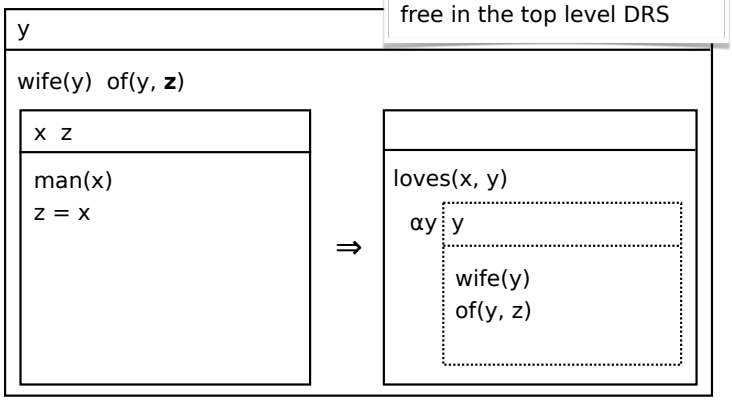


Free Variable Constraint

- *Every man loves his wife.*

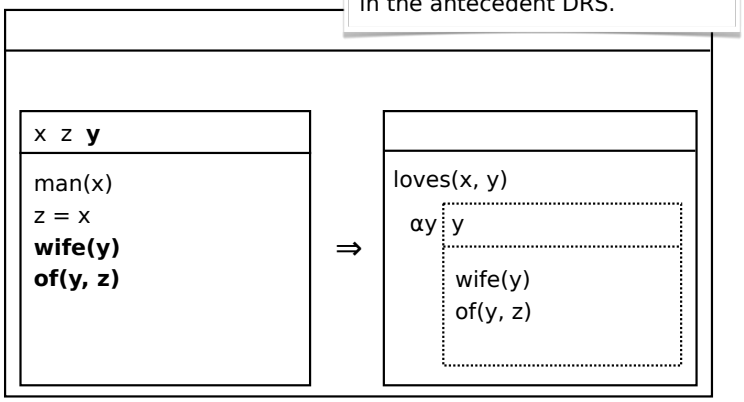
Inadmissible resolution: discourse referent z occurs free in the top level DRS



Free Variable Constraint

- *Every man loves his wife.*

Instead: (local) accommodation in the antecedent DRS.



Further Constraints

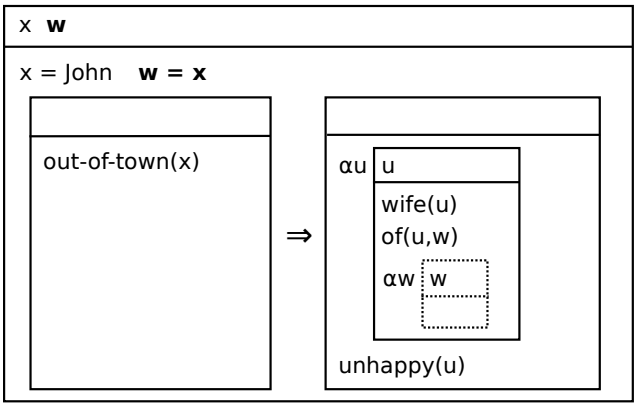
- The resolved DRS must be consistent and informative.
- **Consistency:** The resolved DRS must be satisfiable (taking background knowledge into account).
- **Informativity:** The resolved DRS may not be entailed by our background knowledge.
- **Local consistency:** No sub-DRS must be inconsistent with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

Presupposition Filtering

- *If John is out of town, his wife is unhappy*
  ≫ John is married
- *If John is married, his wife is unhappy*
  NOT ≫ John is married

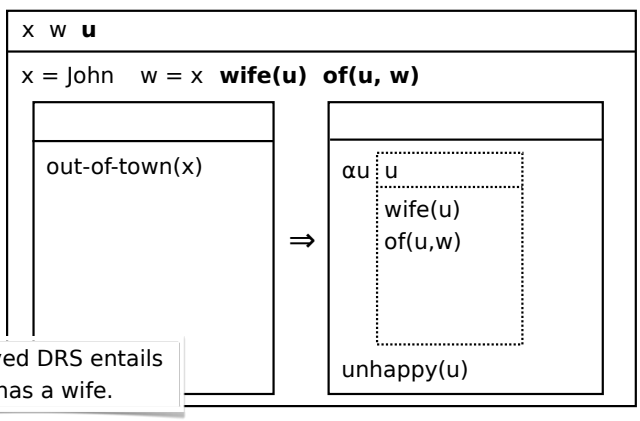
(Local) Informativity

- *If John is out of town, his wife is unhappy.*



(Local) Informativity

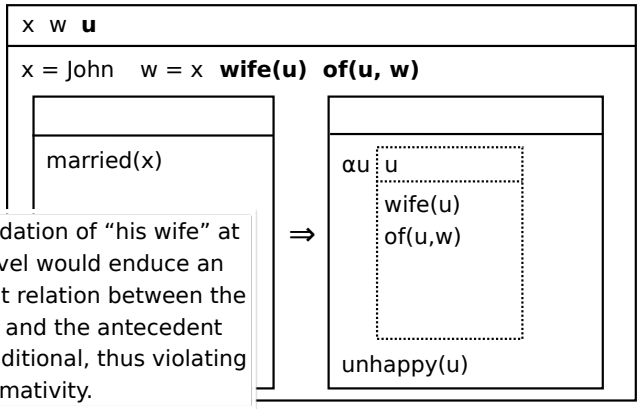
- *If John is out of town, his wife is unhappy.*



The resolved DRS entails that John has a wife.

(Local) Informativity

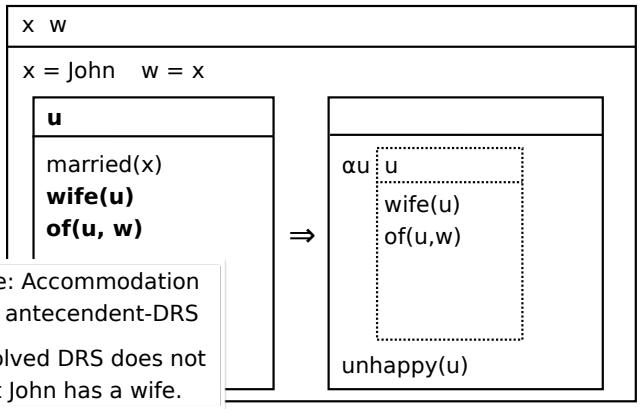
- *If John is married, his wife is unhappy.*



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

(Local) Informativity

- *If John is married, his wife is unhappy.*



Admissible: Accommodation within the antecendent-DRS

⇒ the resolved DRS does not entail that John has a wife.

Literature

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