

Semantic Theory

week 10 – Presuppositions in DRT

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Summary: Presuppositions (Recap)

- Presuppositions are triggered by a number of different words and linguistic constructions, including definite noun phrases.
- Presuppositions behave differently than assertions in semantics construction: They are typically projected unchanged, rather than used in functional application.
- Projected presuppositions can be filtered in the semantic composition process, and can be cancelled by contextual knowledge.

Presuppositions in DRT

Presupposition Projection as Anaphora Resolution 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).

Presupposition as Anaphora

- (1) If a farmer owns a donkey, he feeds **it**.
- (2) If France has a king, **the king of France** is bald.
- (3) # If a farmer doesn't own a donkey, he feeds **it**.
- (4) # If France doesn't have a king, **the king of France** is bald.
- (5) # The farmer feeds **it**.
- (6) **The king of France** is bald.

Van der Sandt – Basic Principles

Introduce “ α -DRSs” as a new type of complex condition

DRS construction proceeds in two steps:

- I. The construction rules for definite noun phrases introduce α -DRSs. This yields a “proto-DRS.”
- II. 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**

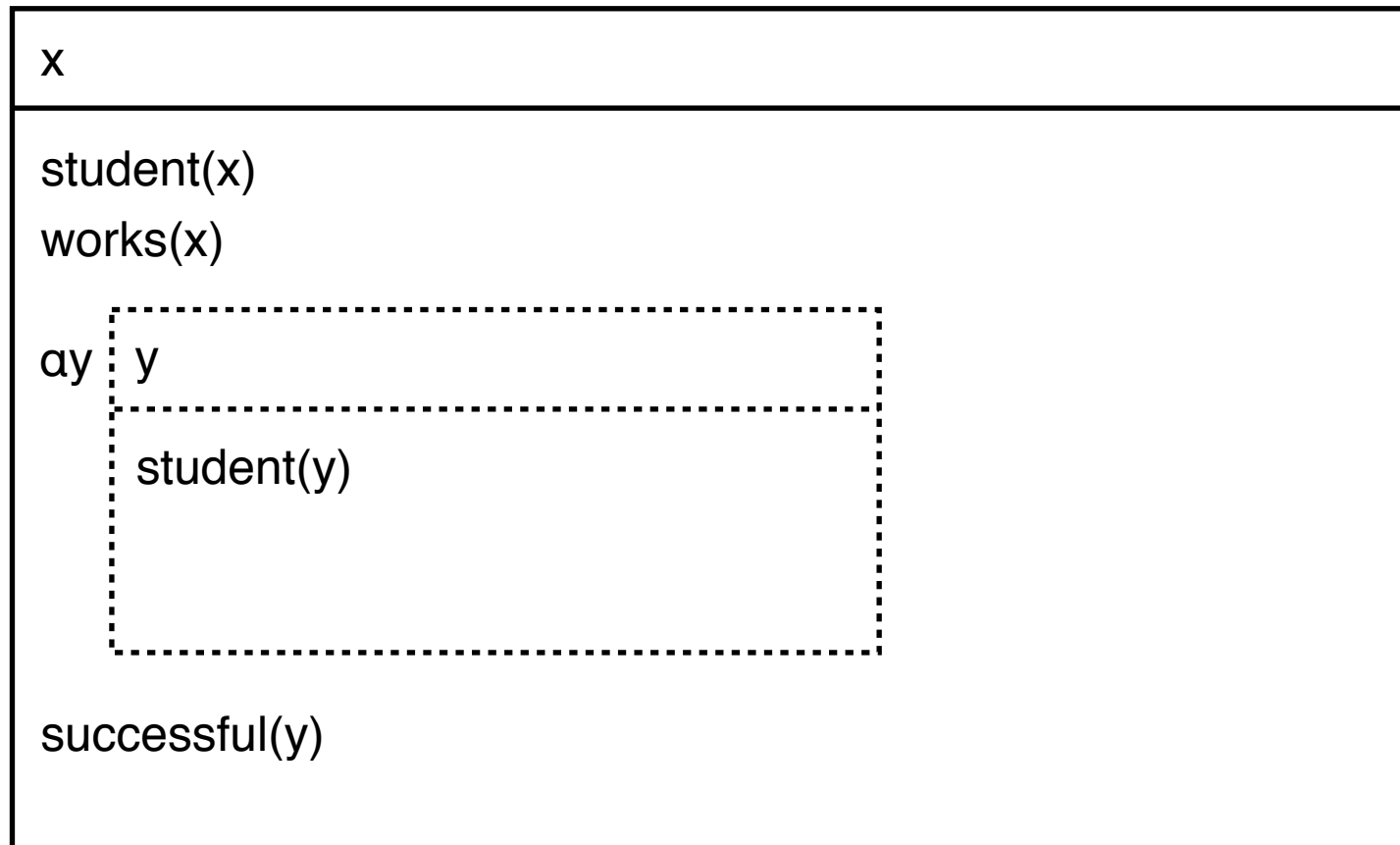
Example – Binding

- *A student works.*

x
student(x) works(x)

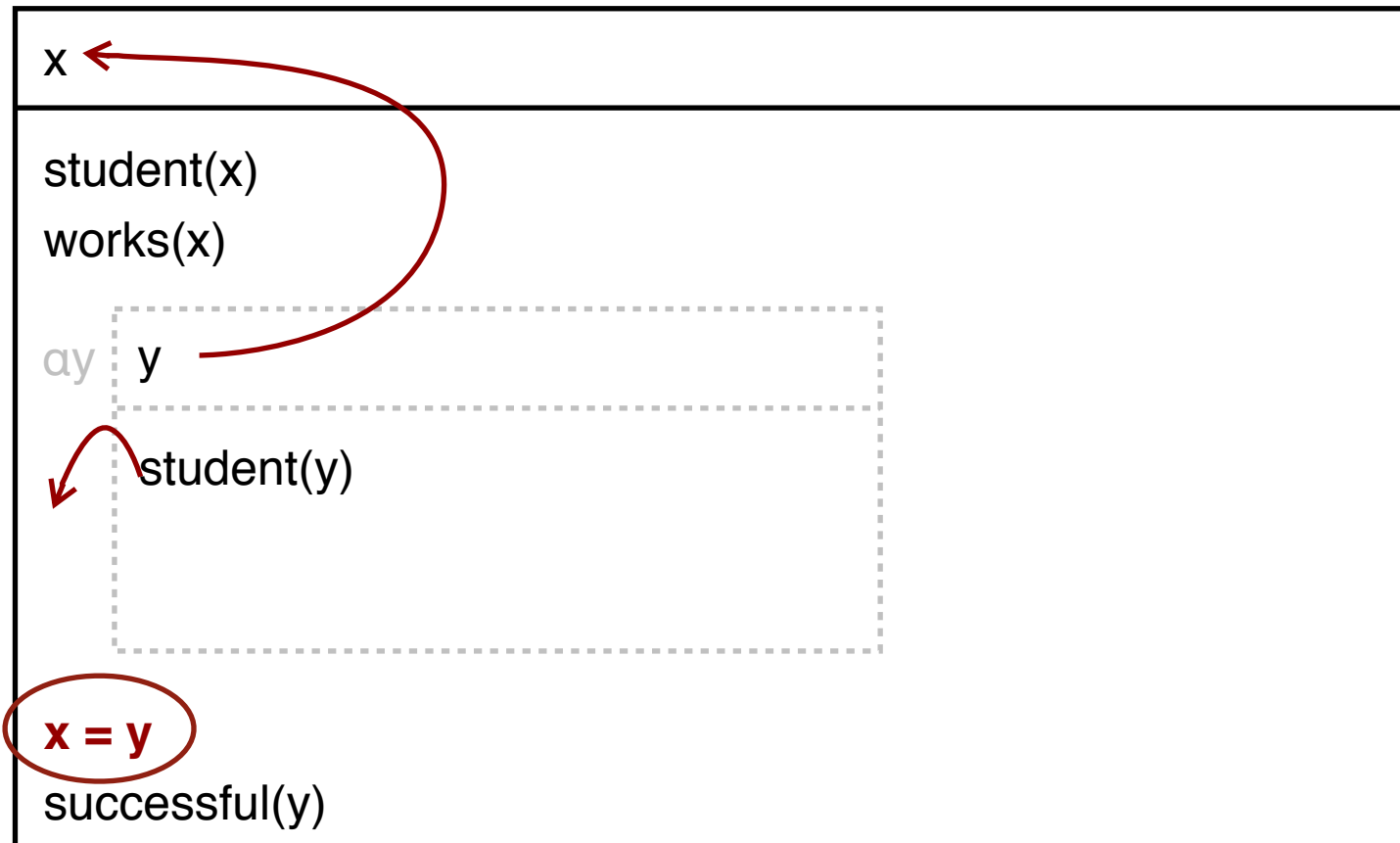
Example – Binding

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



Example – Binding

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



Example – Binding

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

x y

student(x)

works(x)

student(y)

x = y

successful(y)

Accommodation

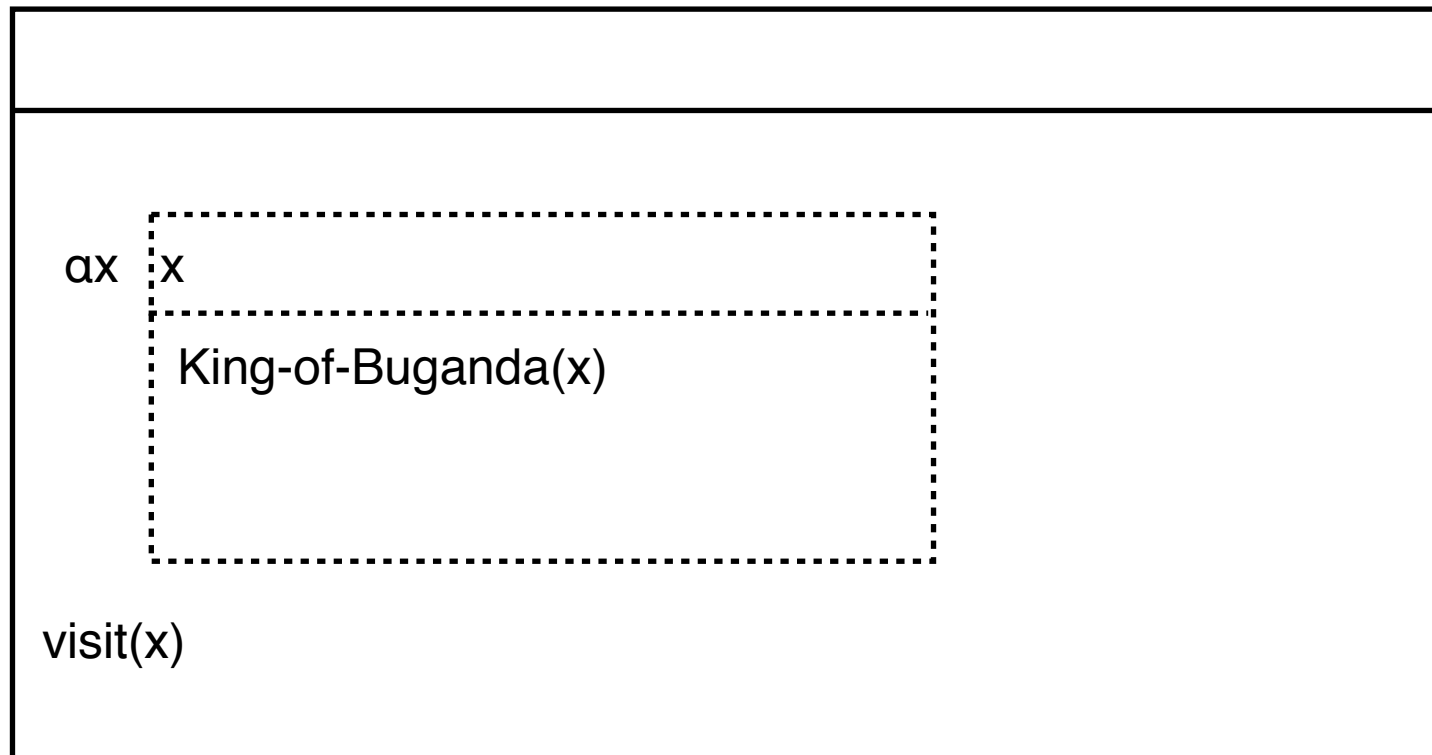
Expressions that trigger presuppositions can often be used even if the context does not satisfy the presupposition:

- (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 as we interpret the sentence: it is *accommodated*

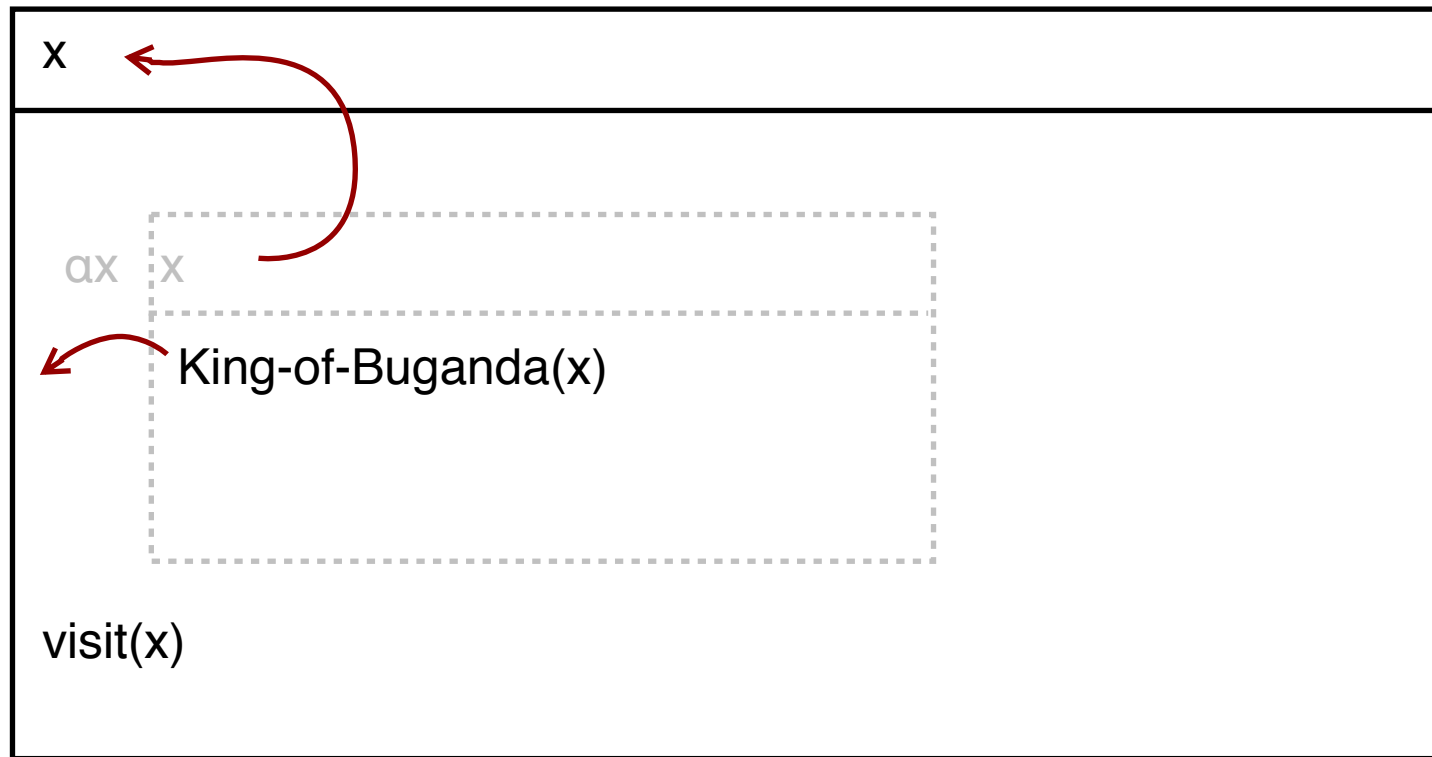
Accommodation

- *The King of Buganda is visiting.*



Accommodation

- *The King of Buganda is visiting.*



Accommodation

- *The King of Buganda is visiting.*

x
King-of-Buganda(x) visit(x)

Syntax for proto-DRSs

A proto-DRS is a triple $\langle U_K, C_K, A_K \rangle$ such that

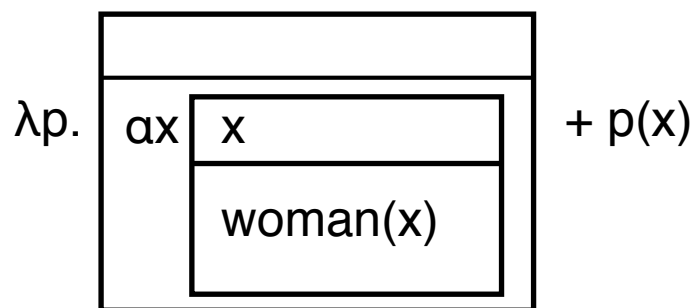
- U_K is a set of discourse referents
- C_K is a set of (atomic or complex) conditions
- A_K is a set of “anaphoric” (α -) DRSs of the form azK' , where z is a discourse referent and K' is a proto-DRS.

A DRS is a proto-DRS $\langle U_K, C_K, A_K \rangle$ such that $A_K = \emptyset$

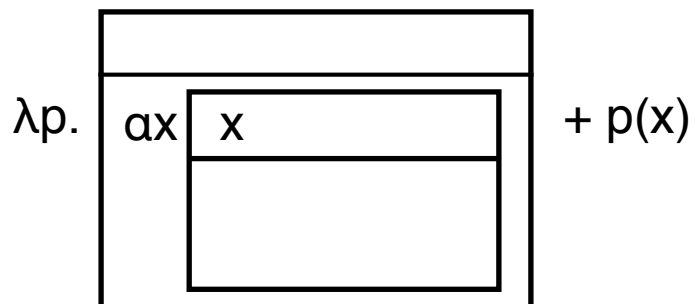
Definite Noun Phrases in DRT

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

- Definite descriptions (“the woman”)



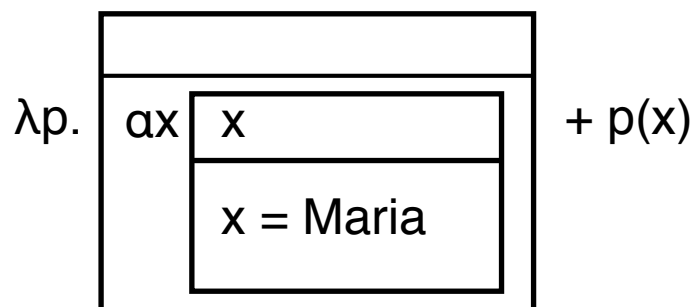
- Pronouns (“he”)



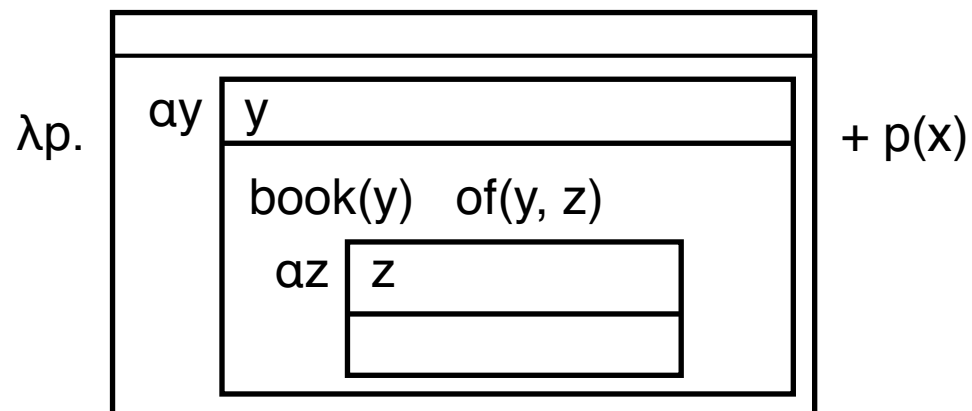
Definite Noun Phrases in DRT (cont.)

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

- Proper names (“Maria”)



- Possessives (“his book”)



Back to: 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
- $y \in U_{K_t}$ is a DR that is accessible and suitable for γ

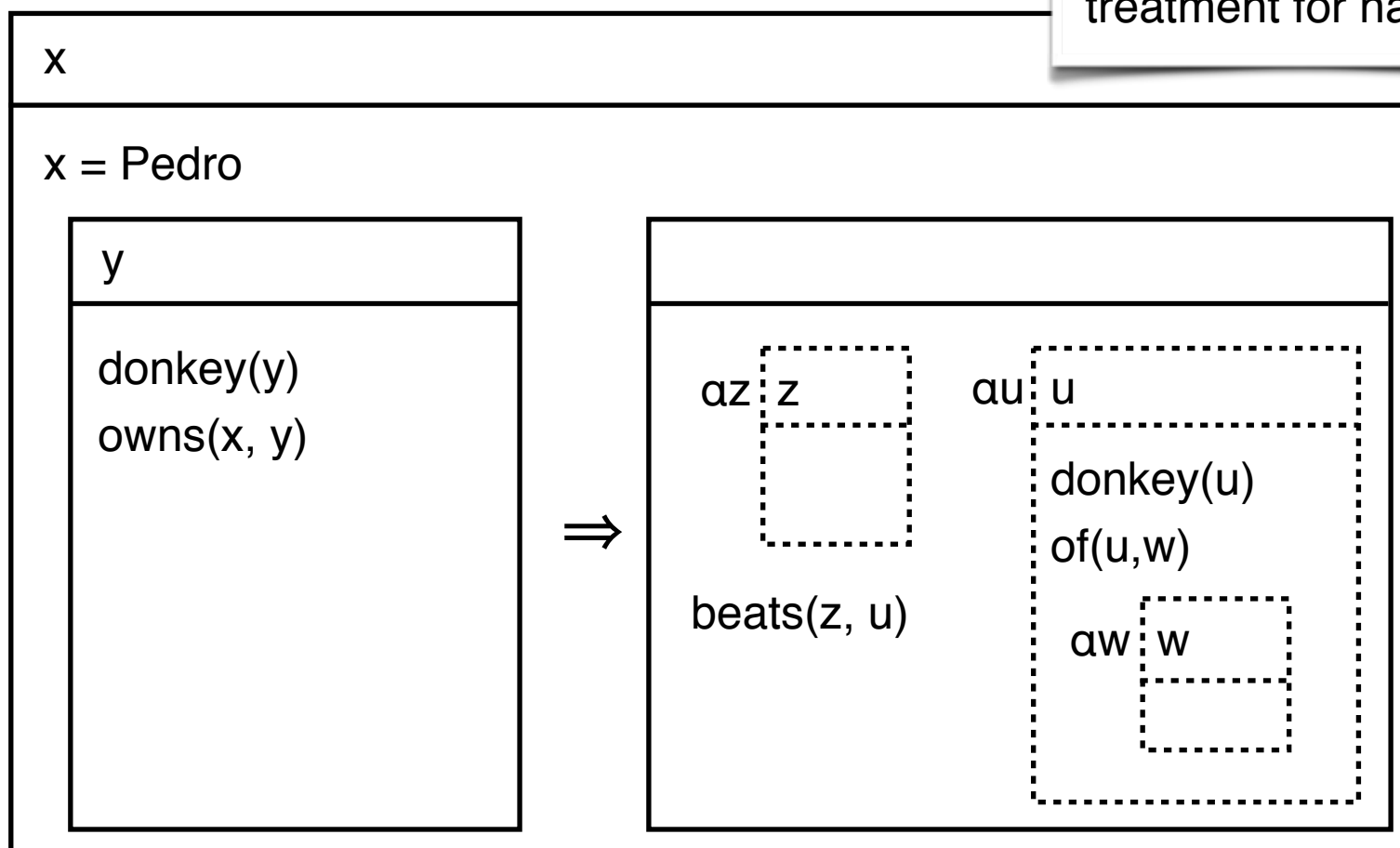
Binding: Remove γ from K' and extend K_t with U_{K_s} , C_{K_s} , and the condition $x = y$.

Note: Because K_s must be α -free, complex Alpha-DRSs are always resolved from the inside out.

Resolution by binding: example

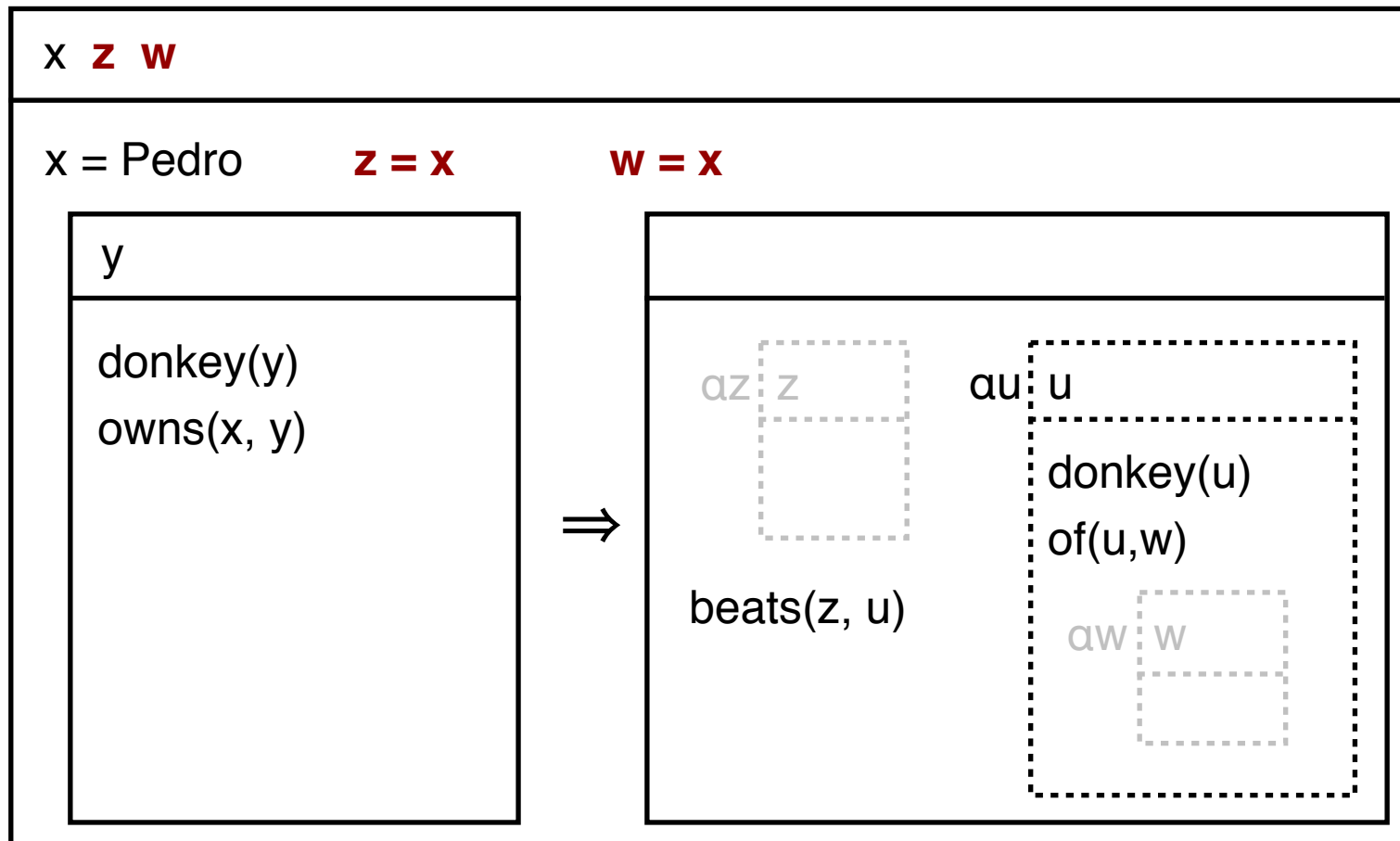
- If Pedro owns a donkey, he beats his donkey.*

NB: we here use the standard DRT treatment for names



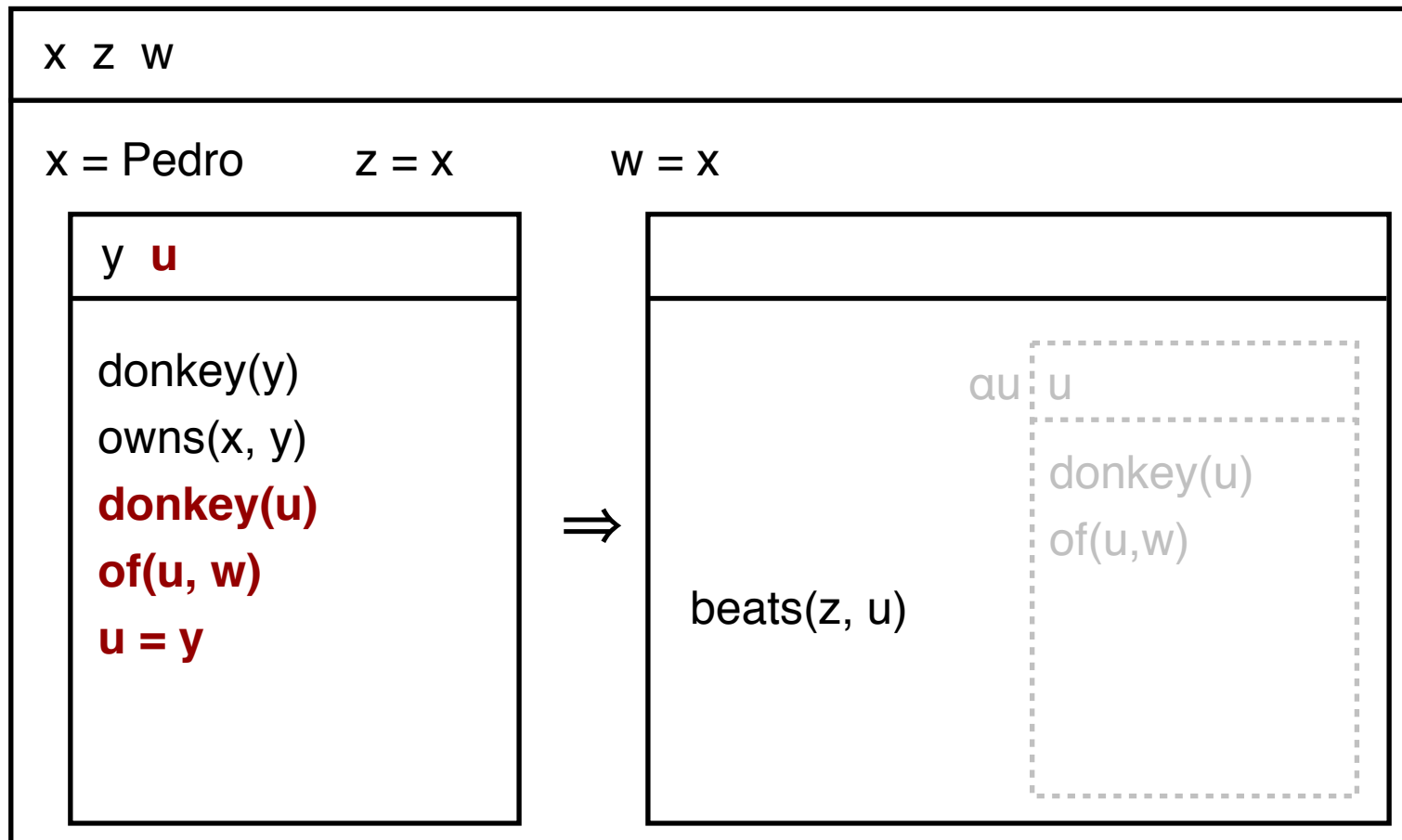
Resolution by binding: example

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



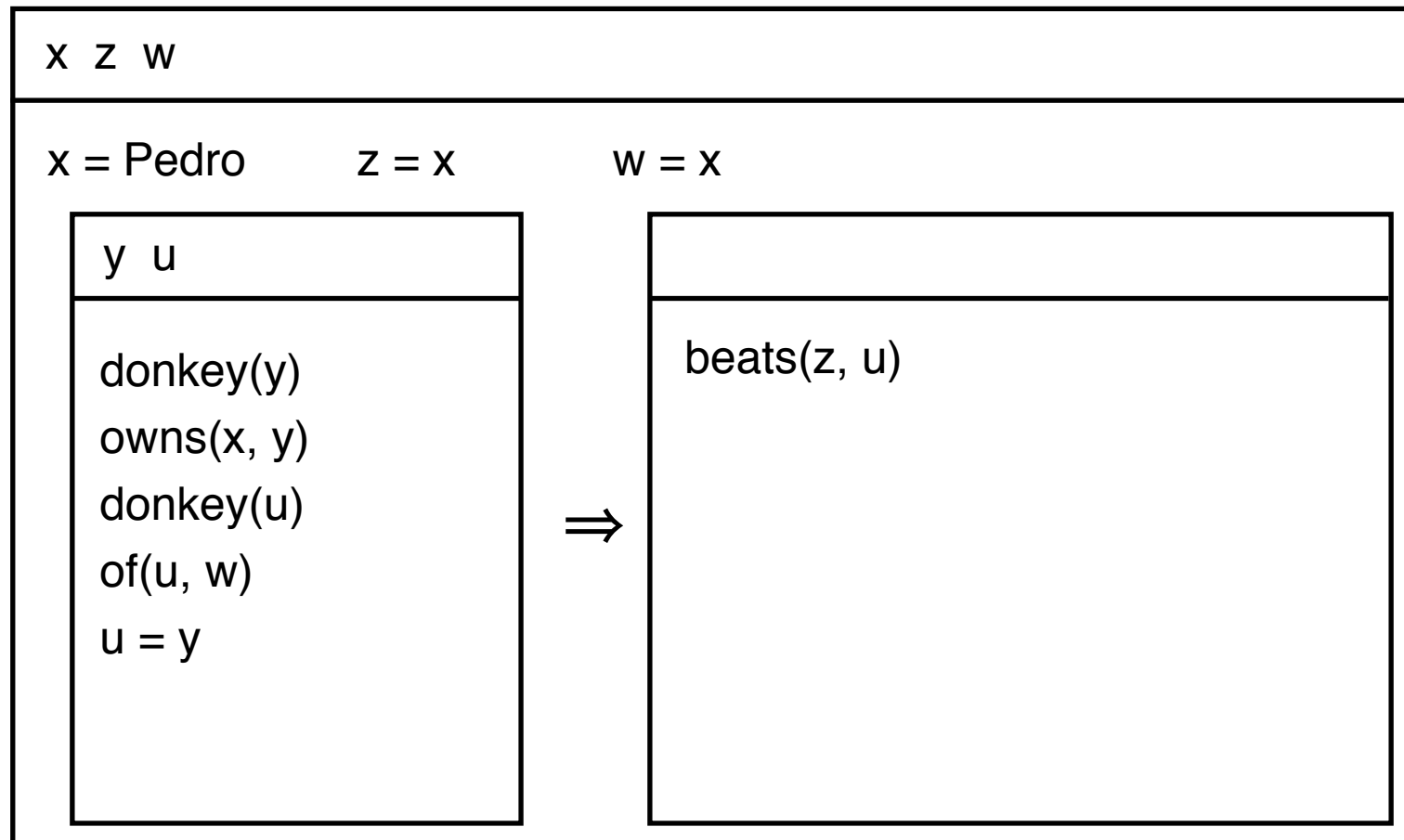
Resolution by binding: example

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



Resolution by binding: example

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



Resolution by accommodation

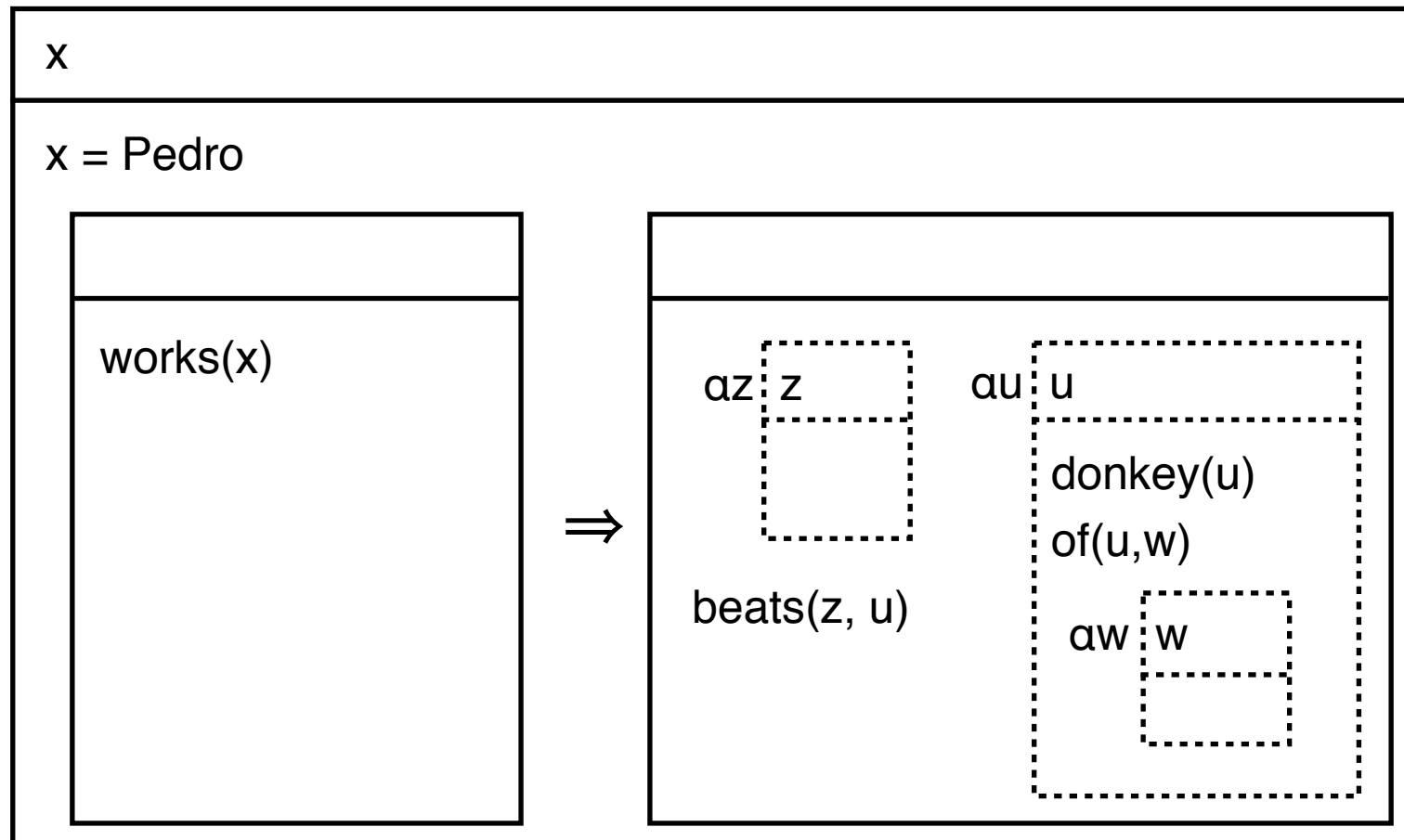
Let K, K' be DRSs such that $K' \leq K$, $K_t \leq K$ and

- $\gamma = \alpha x K_s \in K'$, 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} .

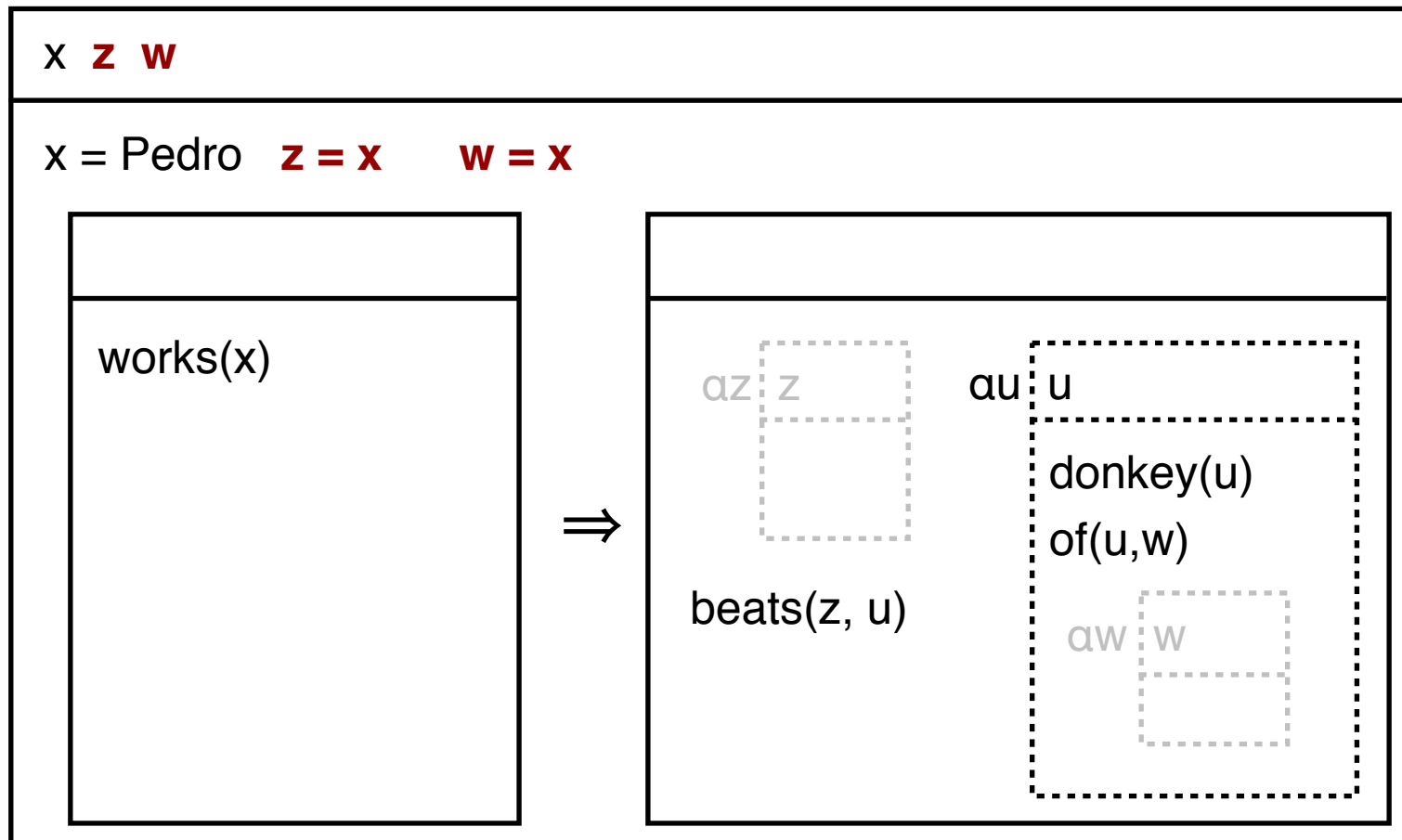
Resolution by accommodation: example

- If Pedro works, he beats his donkey.*



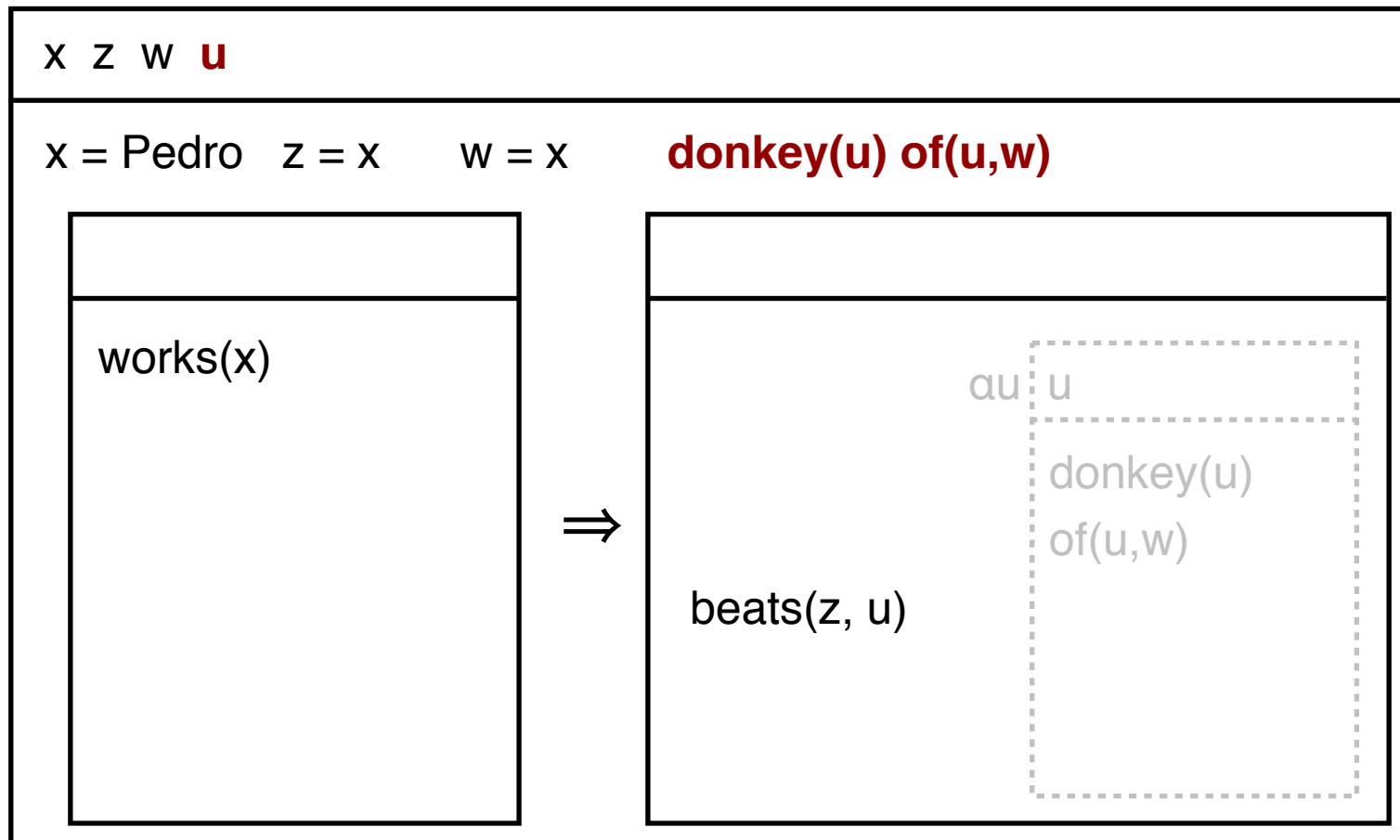
Resolution by accommodation: example

- If Pedro works, he beats his donkey.*



Resolution by accommodation: example

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



Preference principles for presupposition resolution

- 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:

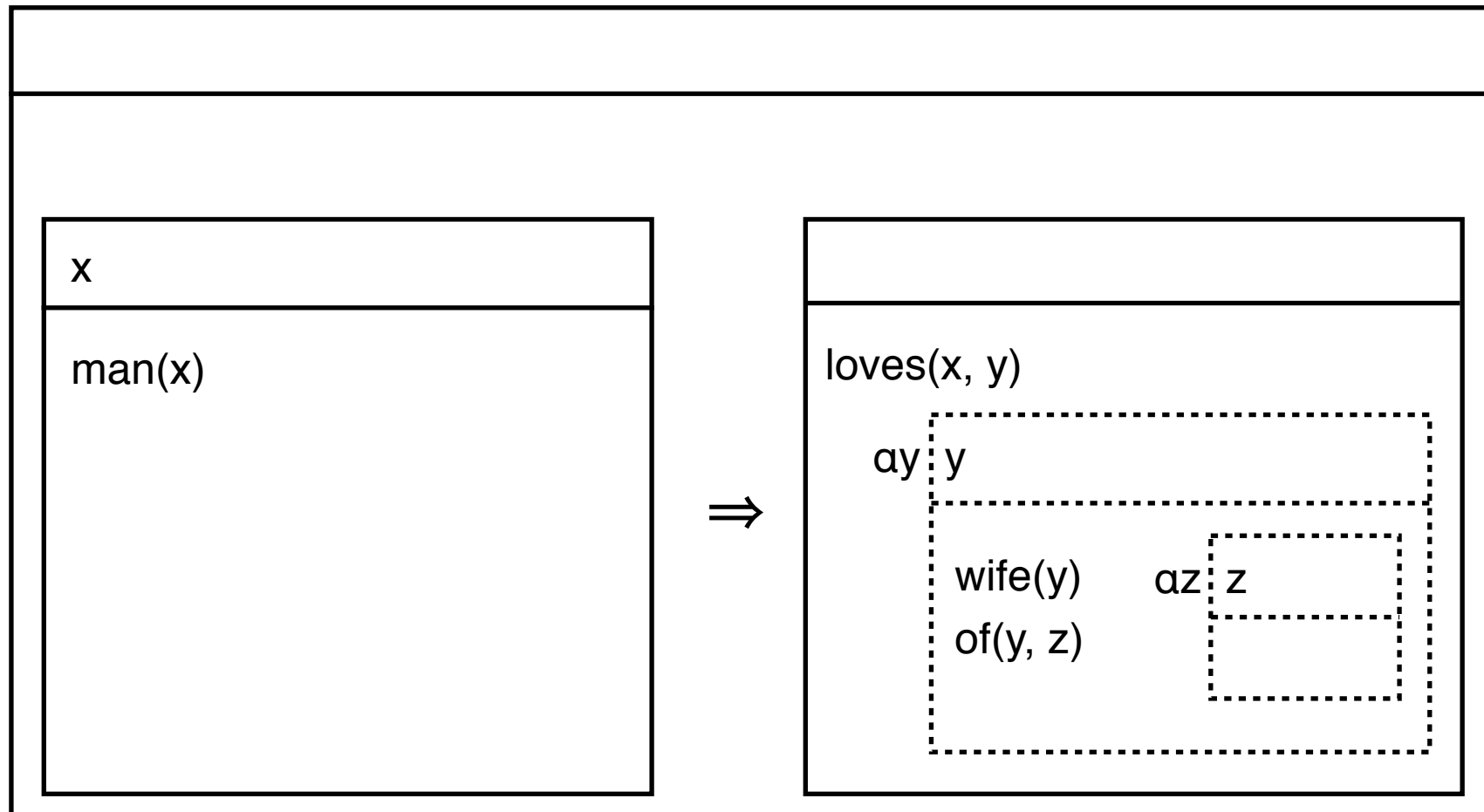
The resolved DRS may not contain any free discourse referents.

Consistency and informativity constraints:

The resolved DRS must be consistent and informative

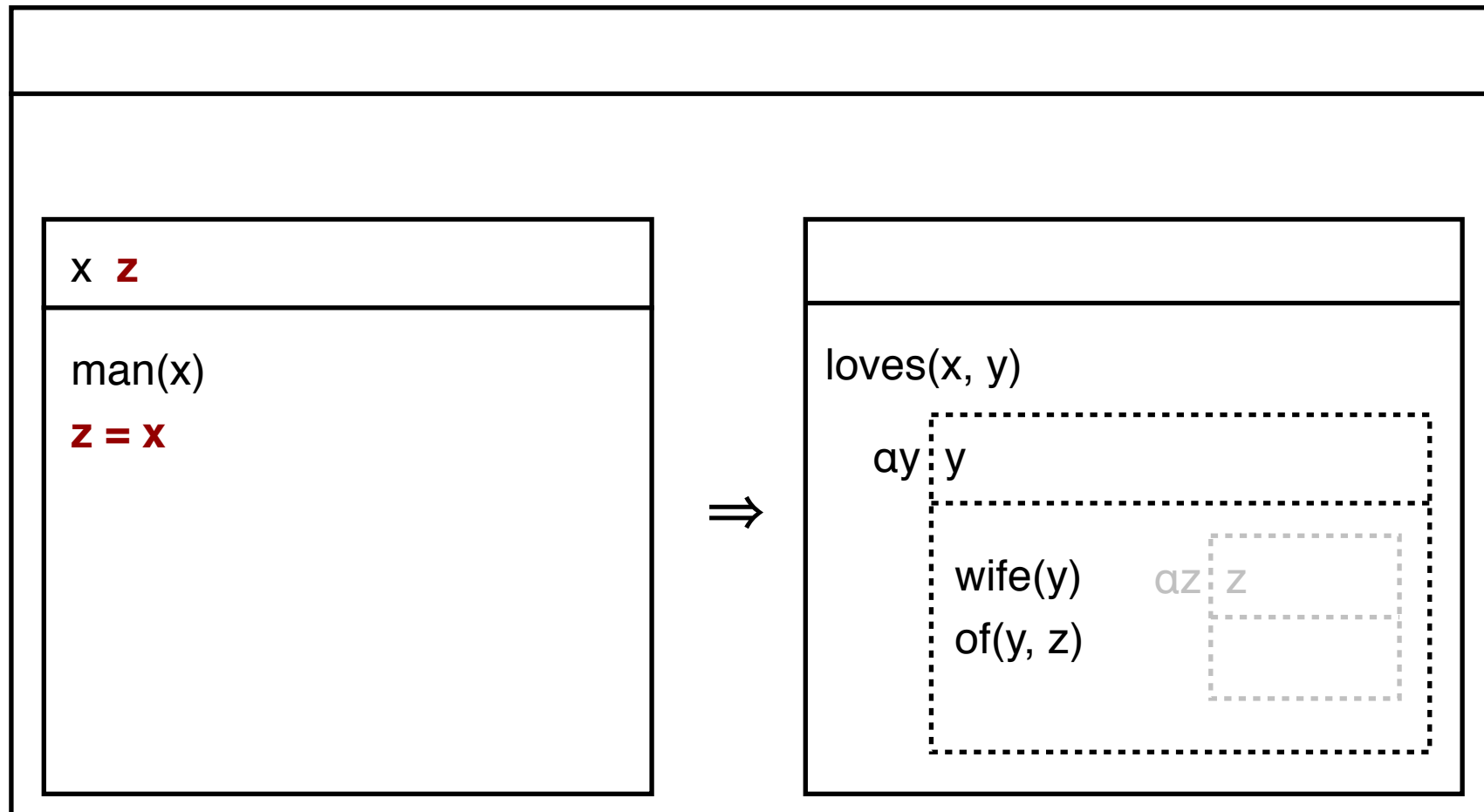
Free variable constraint: example

- *Every man loves his wife.*



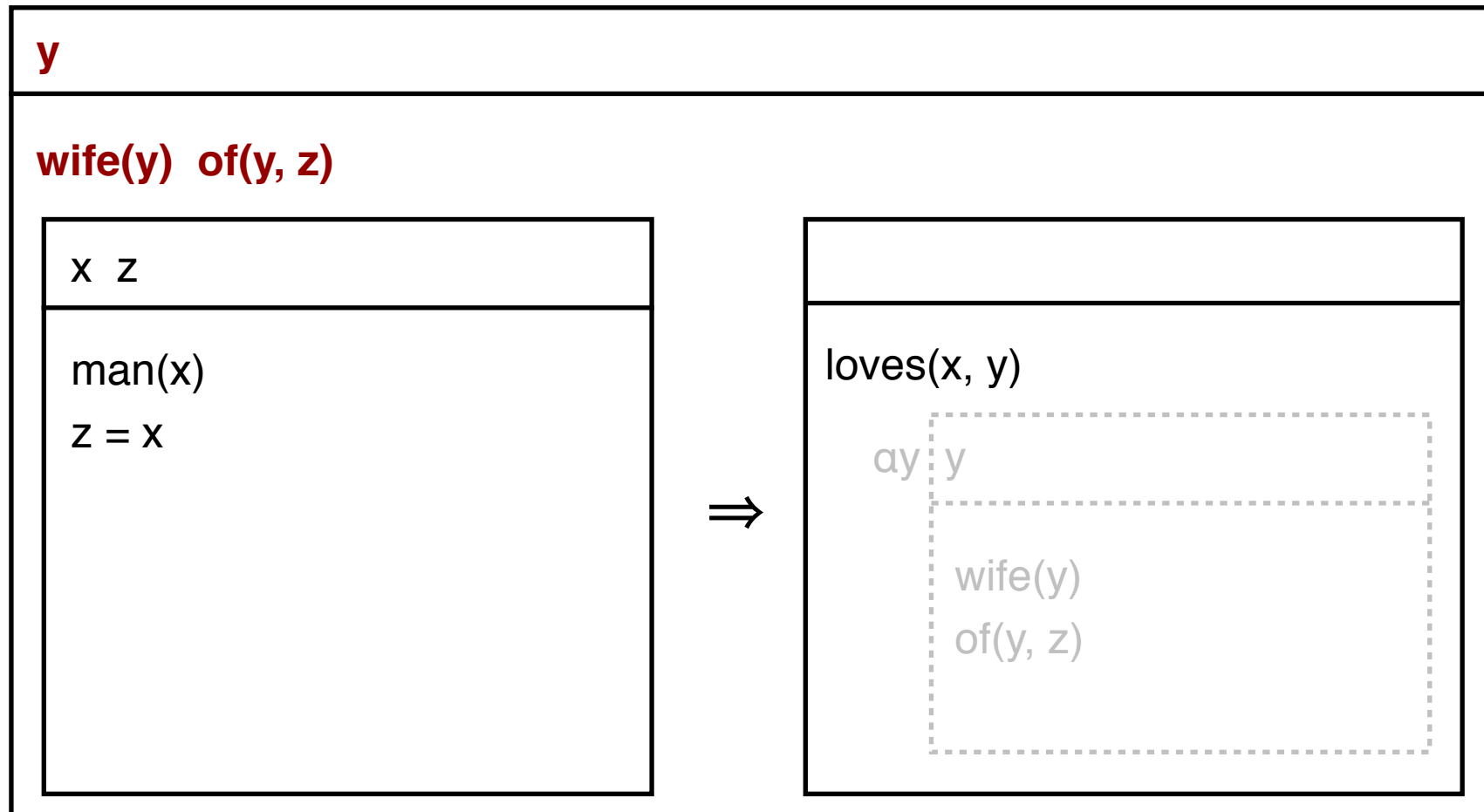
Free variable constraint: example

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Free variable constraint: example

- *Every man loves his wife.*

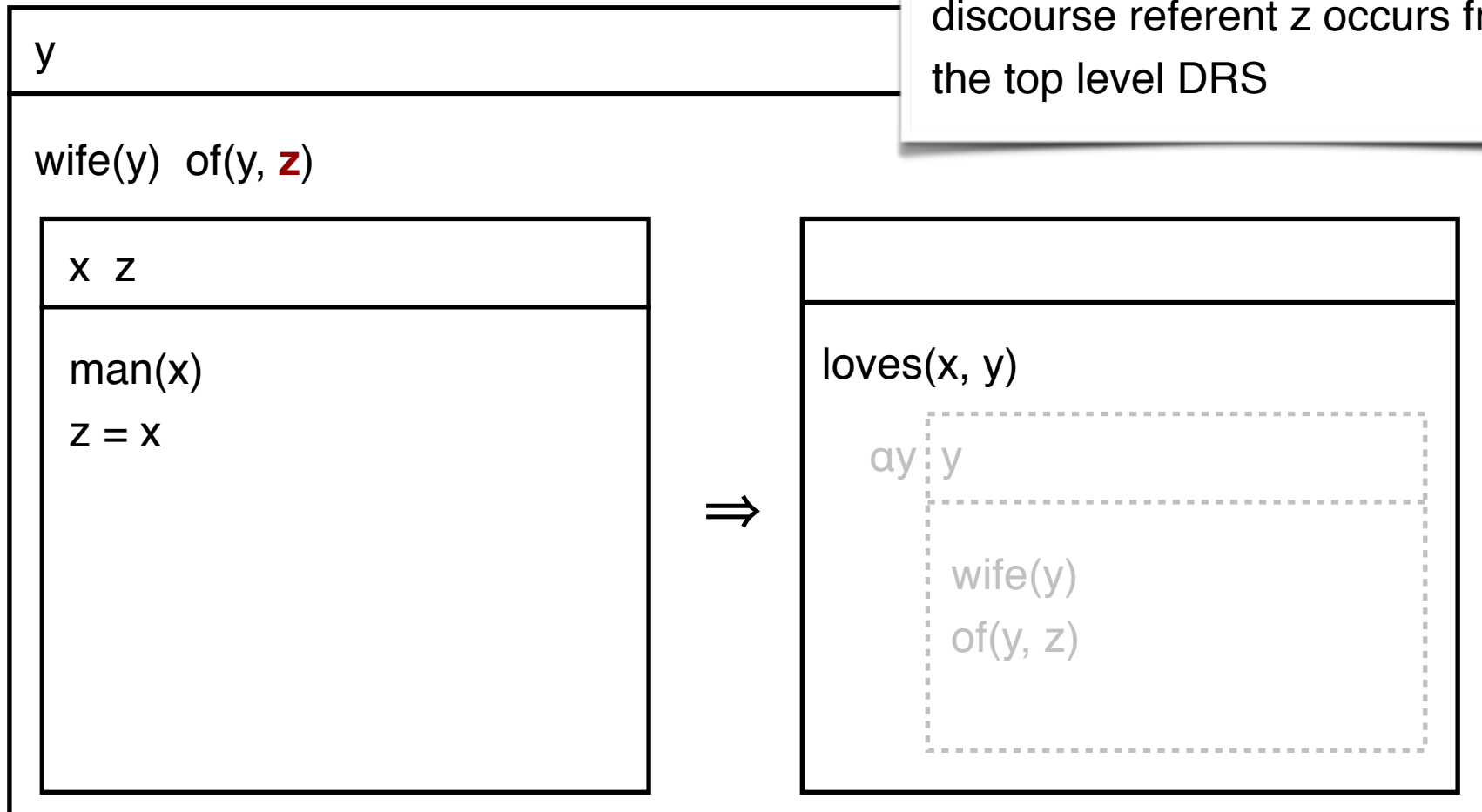


Free variable constraint: example

- *Every man loves his wife.*

Inadmissible resolution:

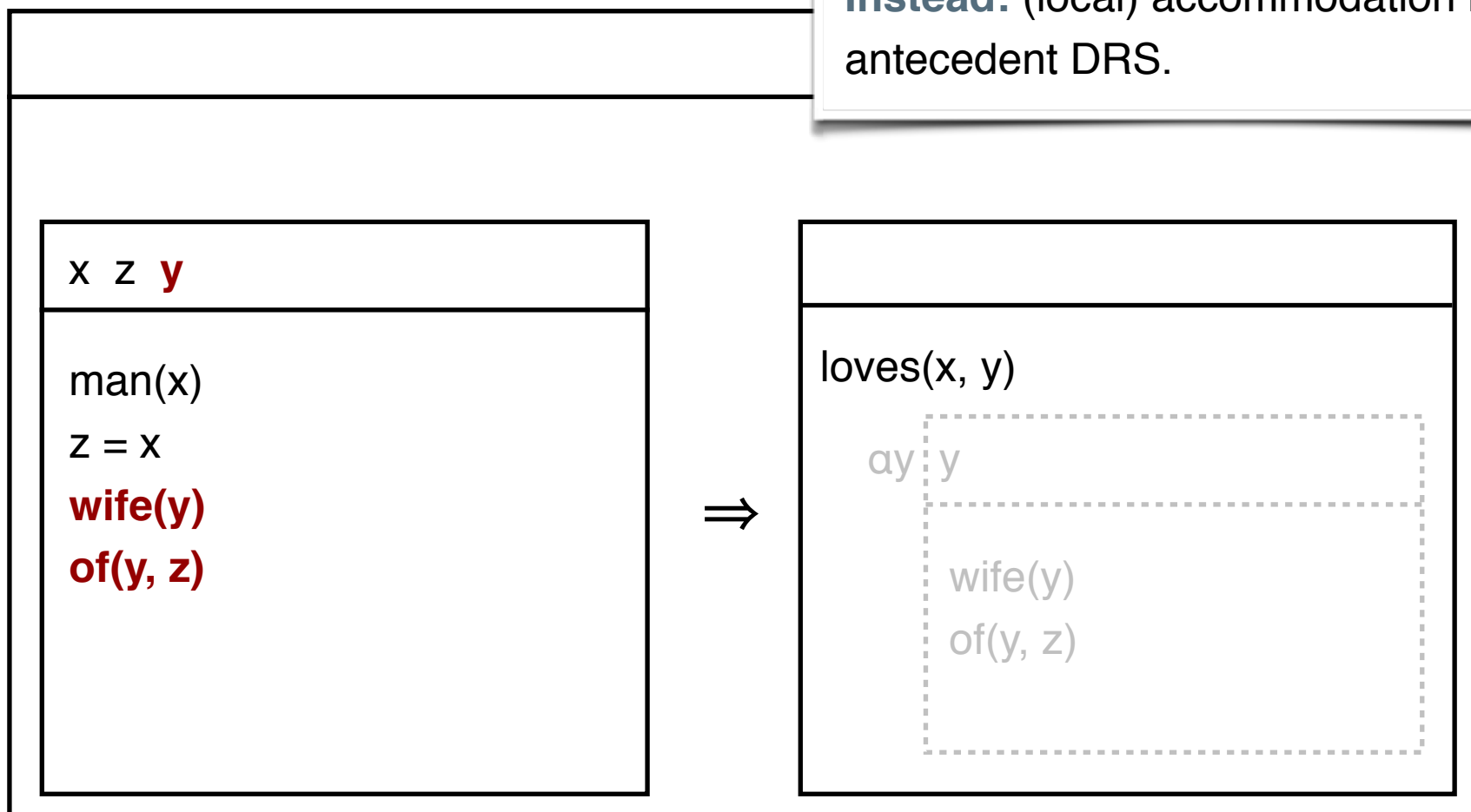
discourse referent z occurs free in the top level DRS



Free variable constraint: example

- *Every man loves his wife.*

Instead: (local) accommodation in the antecedent DRS.



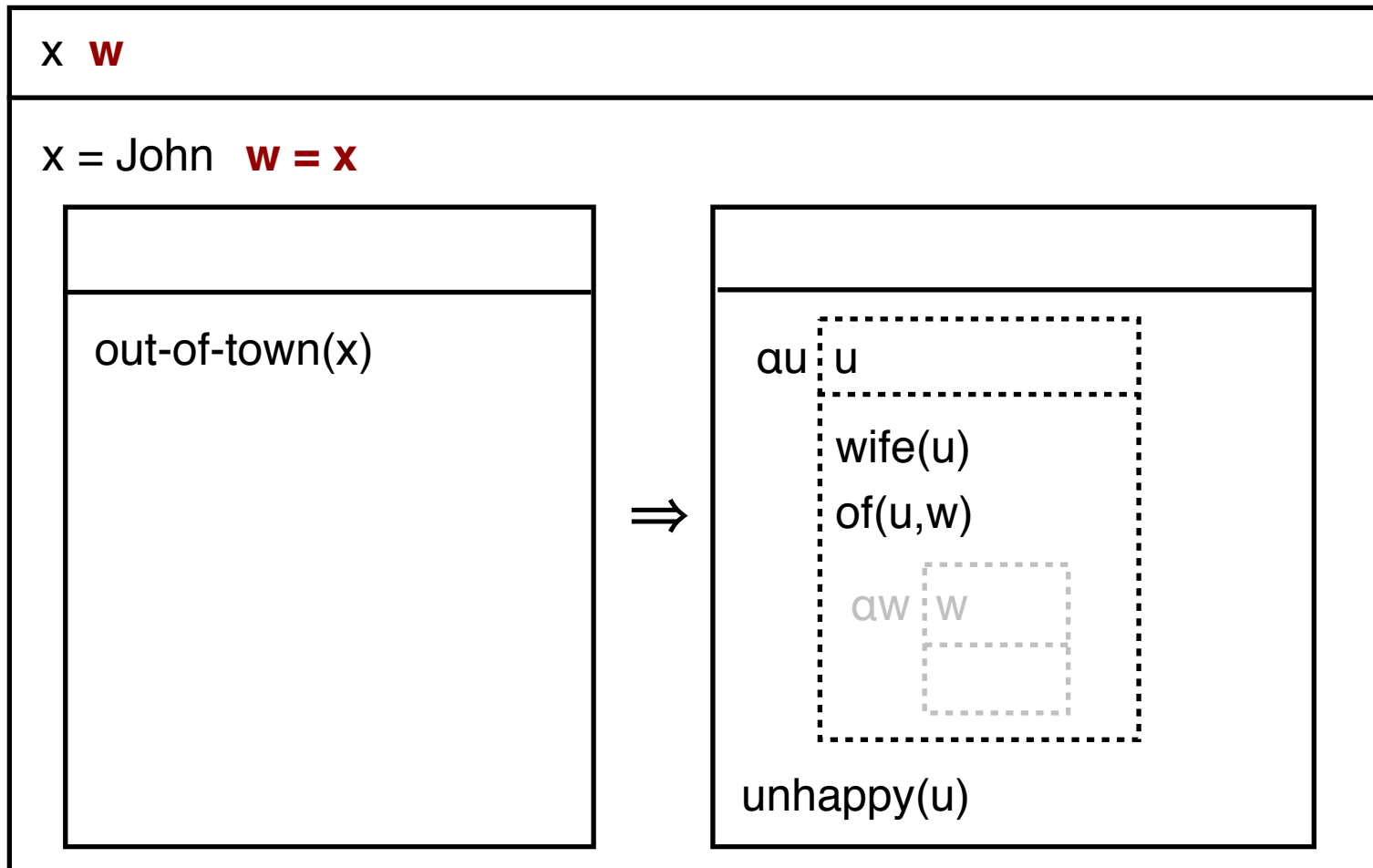
Further constraints on projection

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.

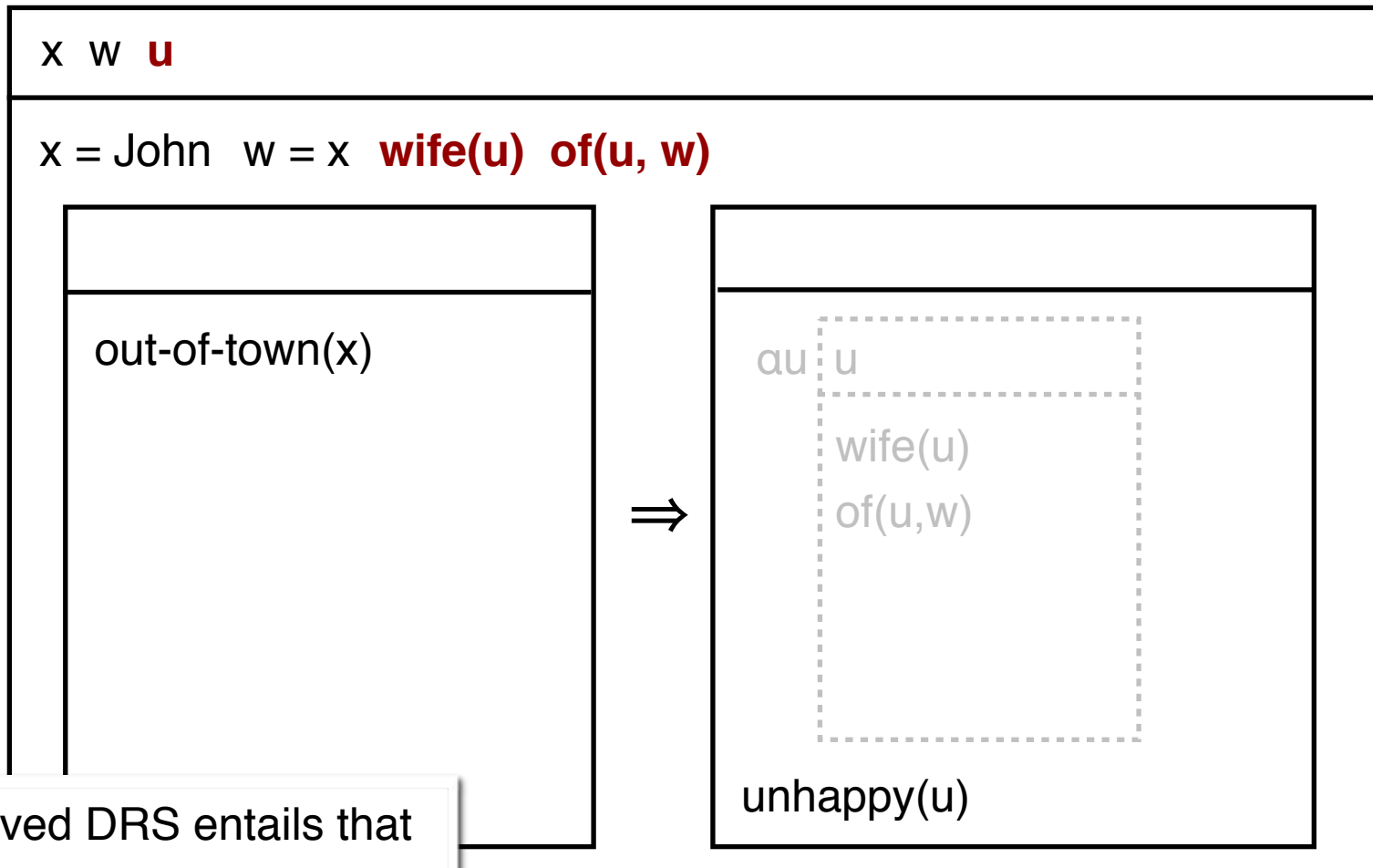
(Local) Informativity: example

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



(Local) Informativity: example

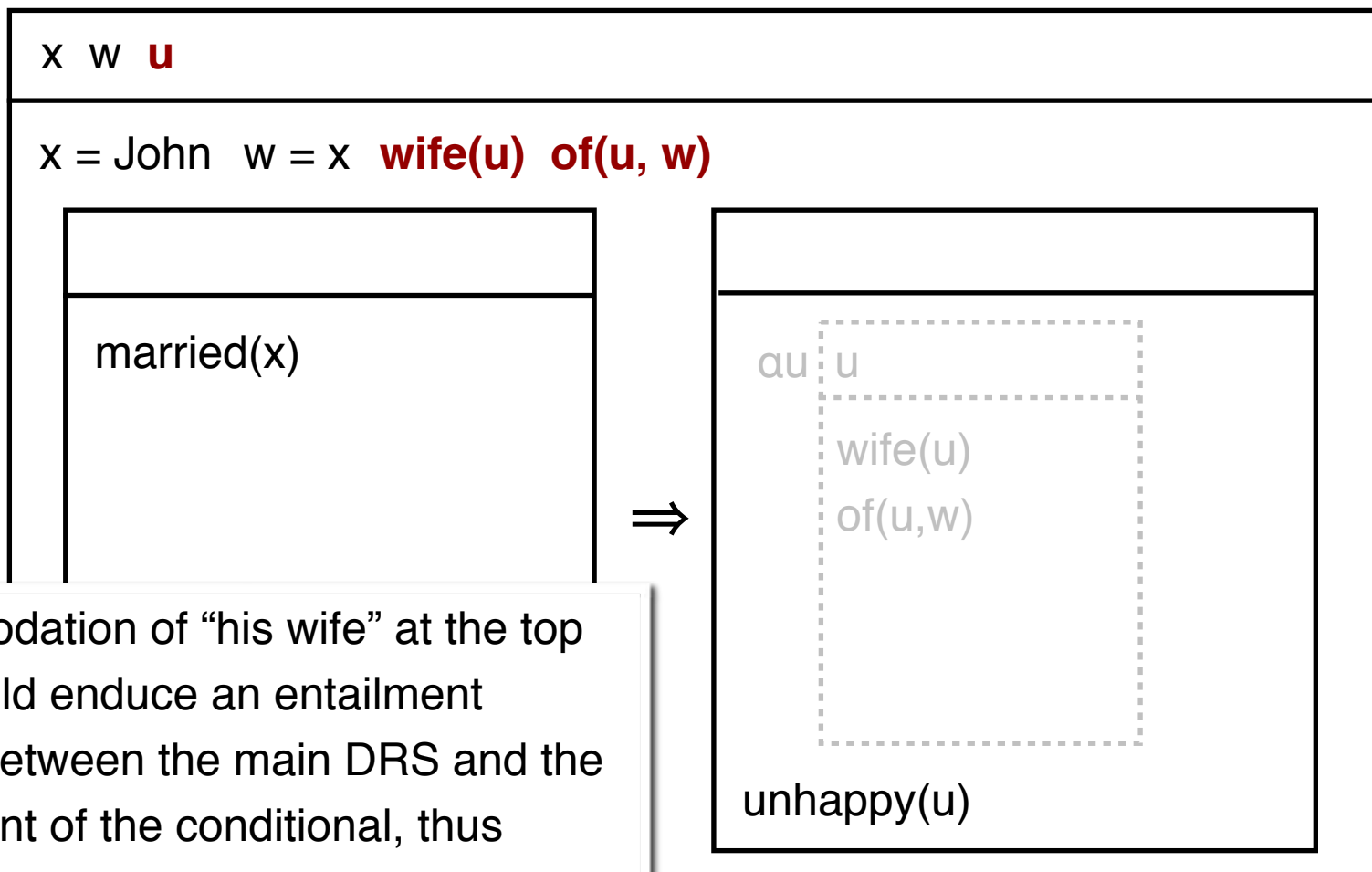
- *If John is out of town, his wife is unhappy.* \gg John is married



The resolved DRS entails that John has a wife.

(Local) Informativity: example

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

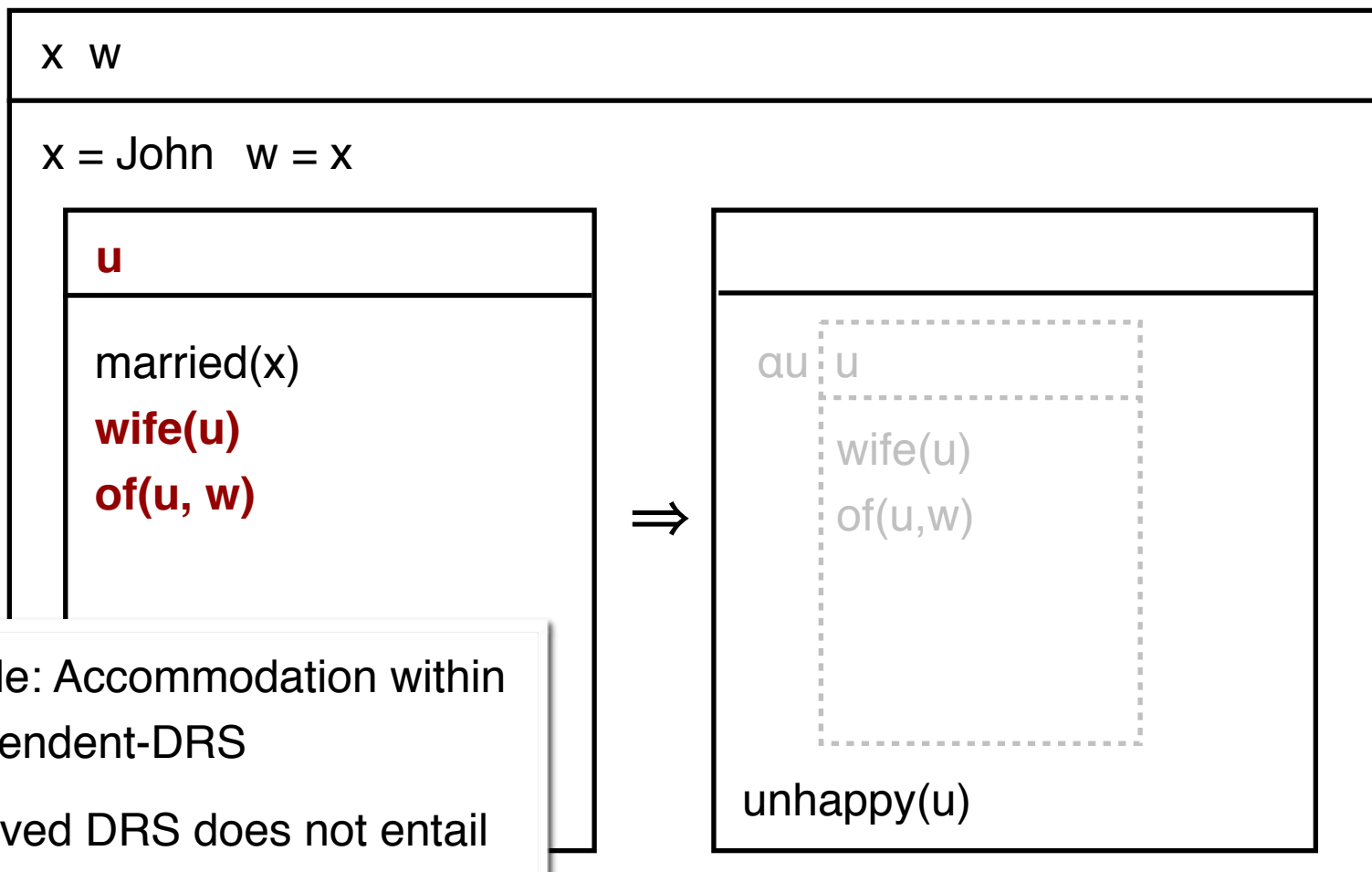


Accommodation of “his wife” at the top level would induce an entailment relation between the main DRS and the antecedent of the conditional, thus violating local informativity.

(Local) Informativity: example

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

✗ John is married



Admissible: Accommodation within the antecedent-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