Semantic Theory
week 10 – Presuppositions in DRT

Noortje Venhuizen

University of Groningen/Universität des Saarlandes

Summer 2015

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)

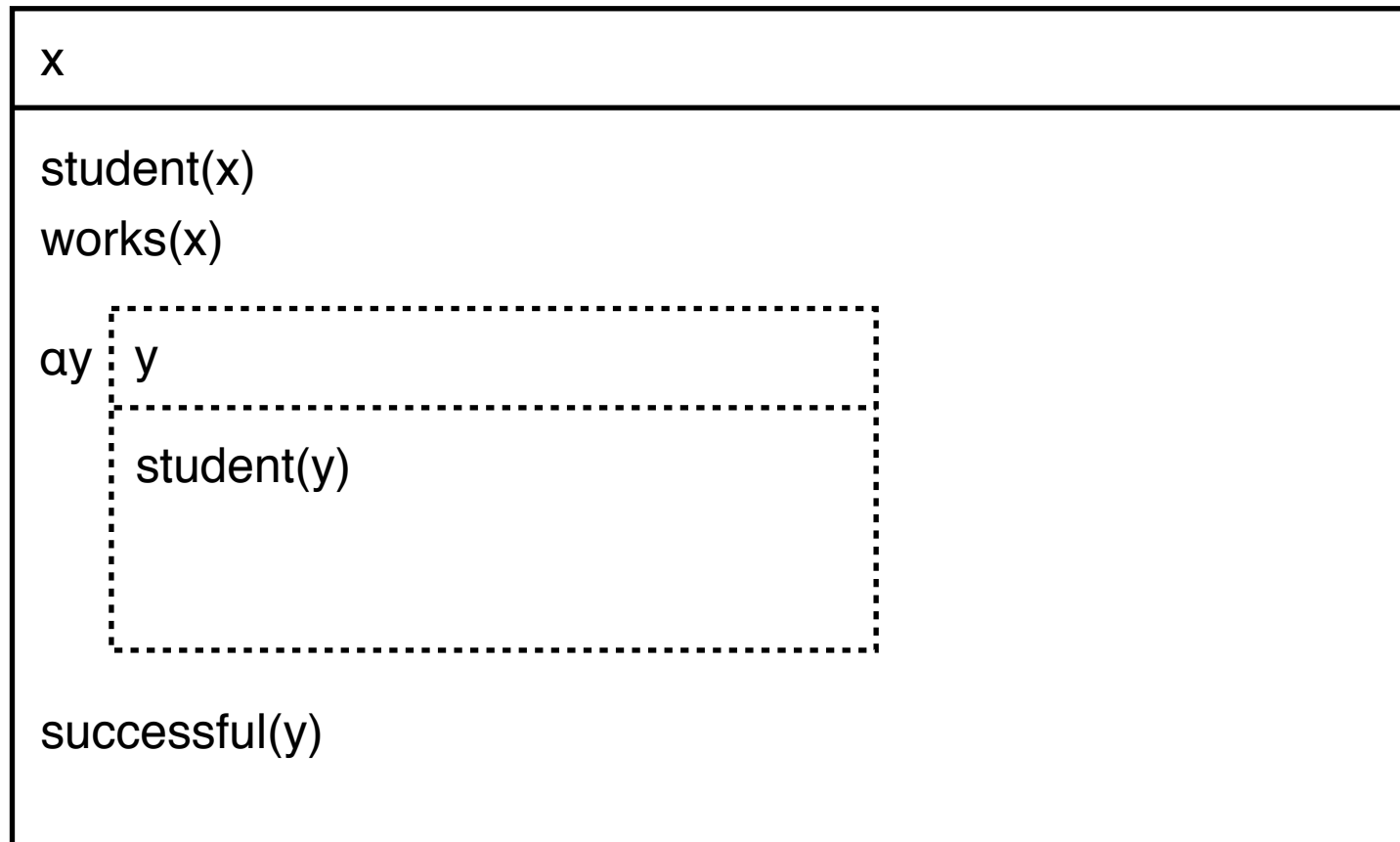Resolution: presuppositions can be either **bound** or **accommodated**

Example – Binding

- *A student works.*

x
student(x)
works(x)

Example – Binding

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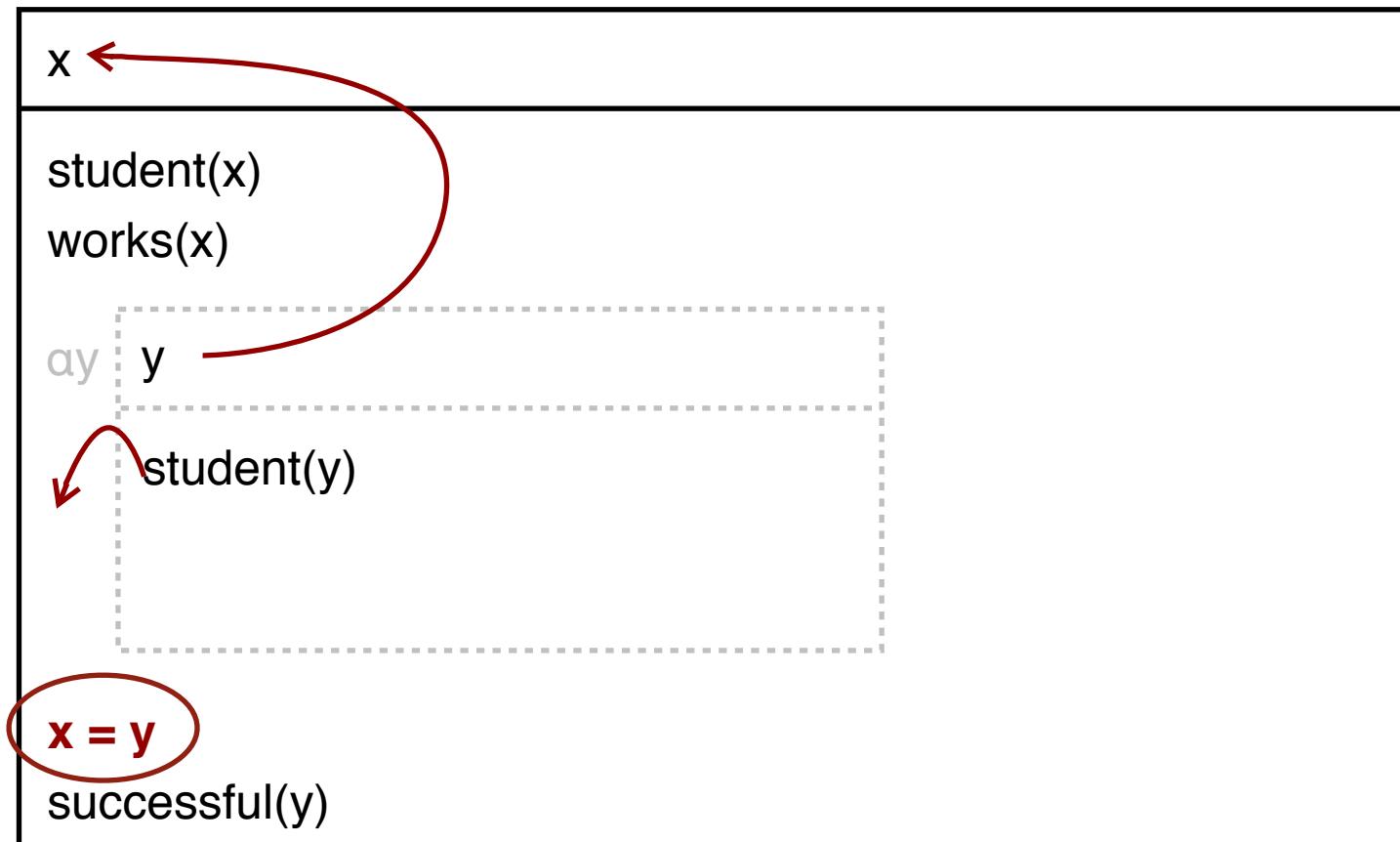

x

student(x)
works(x)

αy   y

student(y)

successful(y)

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)
```
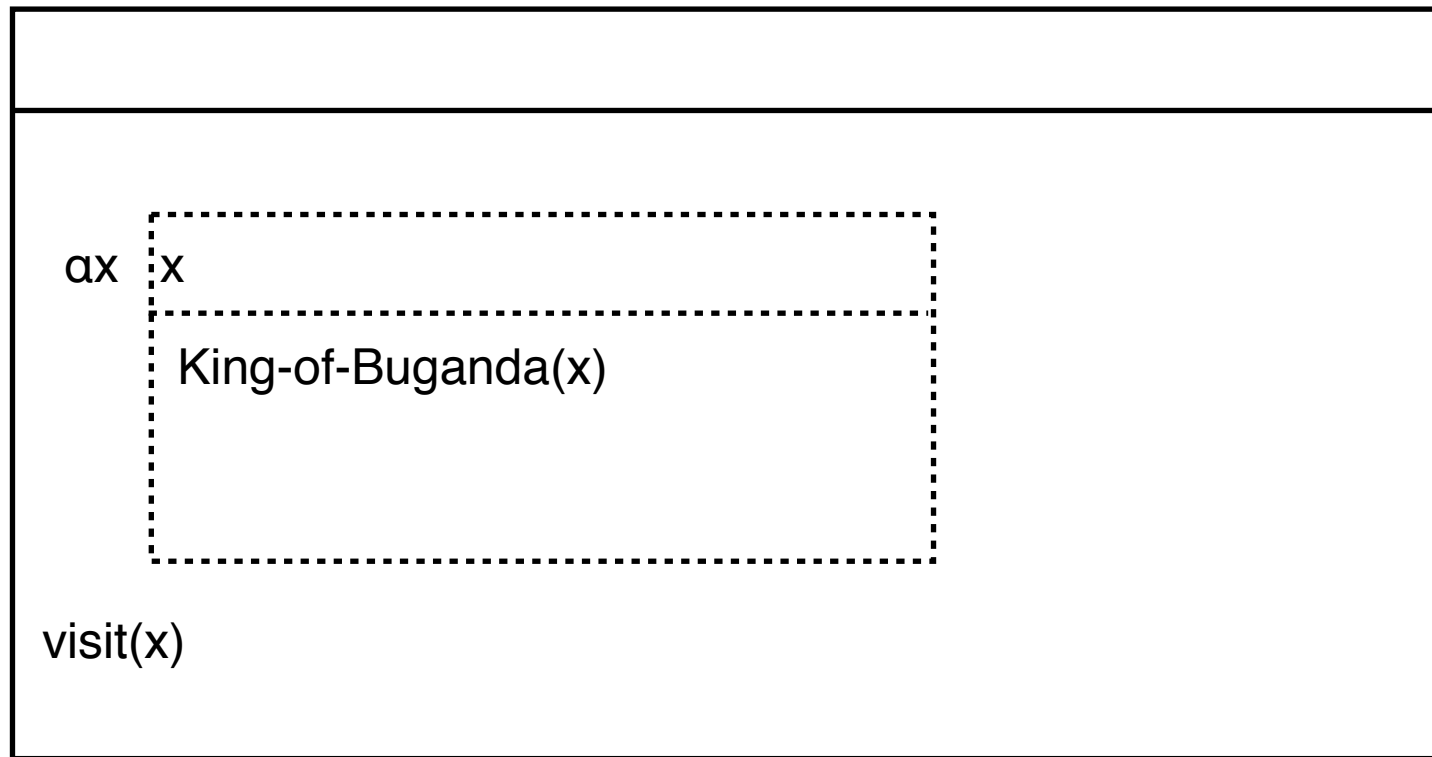
Accommodation

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*

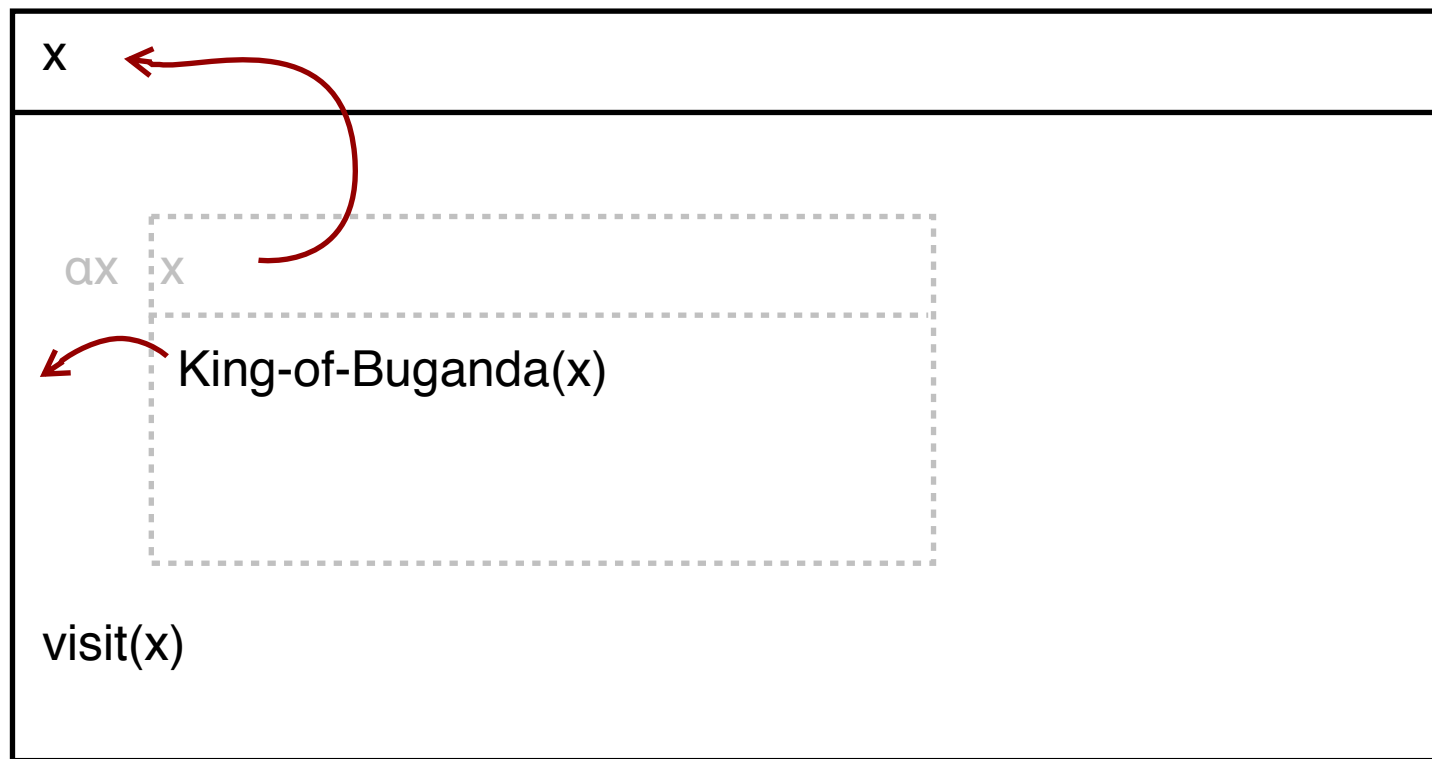The missing information is silently added to the context as we interpret the sentence: it is *accommodated*

Accommodation

- *The King of Buganda is visiting.*

αx   x

King-of-Buganda(x)

visit(x)

Accommodation

- *The King of Buganda is visiting.*

visit(x)

αx x

King-of-Buganda(x)

Accommodation

- *The King of Buganda is visiting.*

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

DRS-Construction

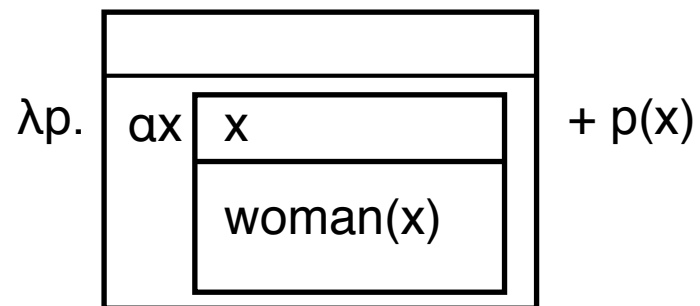A proto-DRS is a triple $\langle U_K, C_K, A_K \rangle$ such that

- 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 $\alpha z K'$, where z is a discourse referent and K' is a proto-DRS.

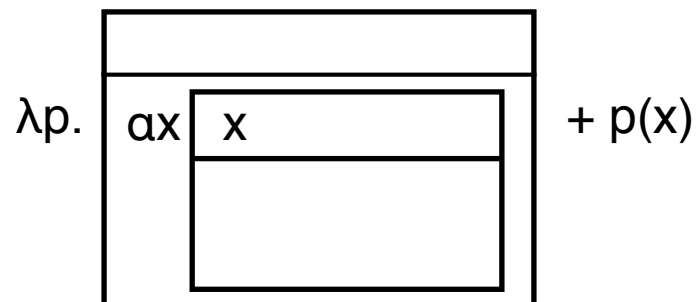A DRS is a proto-DRS $\langle U_K, C_K, A_K \rangle$ such that $A_K = \varnothing$

Definite Noun Phrases in DRT

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

- ## Definite descriptions ("the woman")

$$\lambda p. \begin{array}{|c|} \hline \\ \hline \alpha x \begin{array}{|c|} \hline x \\ \hline woman(x) \\ \hline \end{array} \\ \hline \end{array} + p(x)$$

- ## Pronouns ("he")

$$\lambda p. \begin{array}{|c|} \hline \\ \hline \alpha x \begin{array}{|c|} \hline x \\ \hline \\ \hline \end{array} \\ \hline \end{array} + p(x)$$
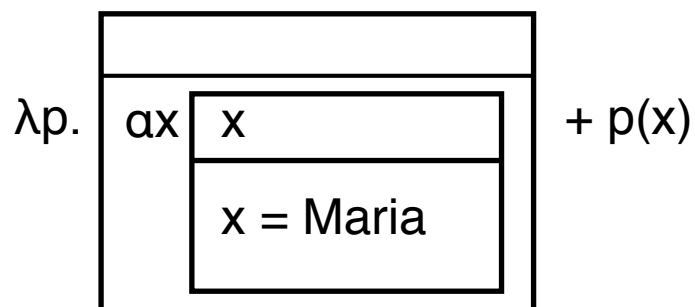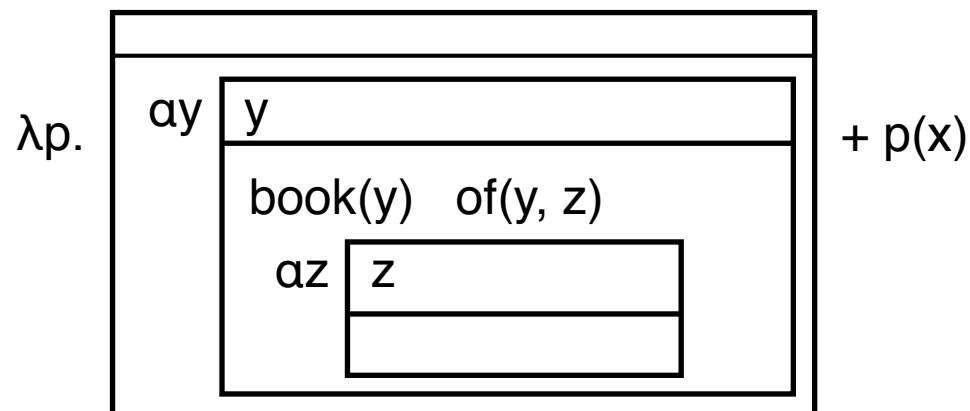
Definite Noun Phrases in DRT (cont.)

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

- Proper names ("Maria")

$$\lambda p. \boxed{\begin{array}{|l|} \hline \\ \hline \alpha x \, \boxed{\begin{array}{|l|} \hline x \\ \hline x = \text{Maria} \\ \hline \end{array}} \\ \hline \end{array}} + p(x)$$

- Possessives ("his book")

$$\lambda p. \boxed{\begin{array}{|l|} \hline \\ \hline \alpha y \, \boxed{\begin{array}{|l|} \hline y \\ \hline \text{book}(y) \quad \text{of}(y, z) \\ \alpha z \, \boxed{\begin{array}{|l|} \hline z \\ \hline \\ \hline \end{array}} \\ \hline \end{array}} \\ \hline \end{array}} + p(x)$$

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

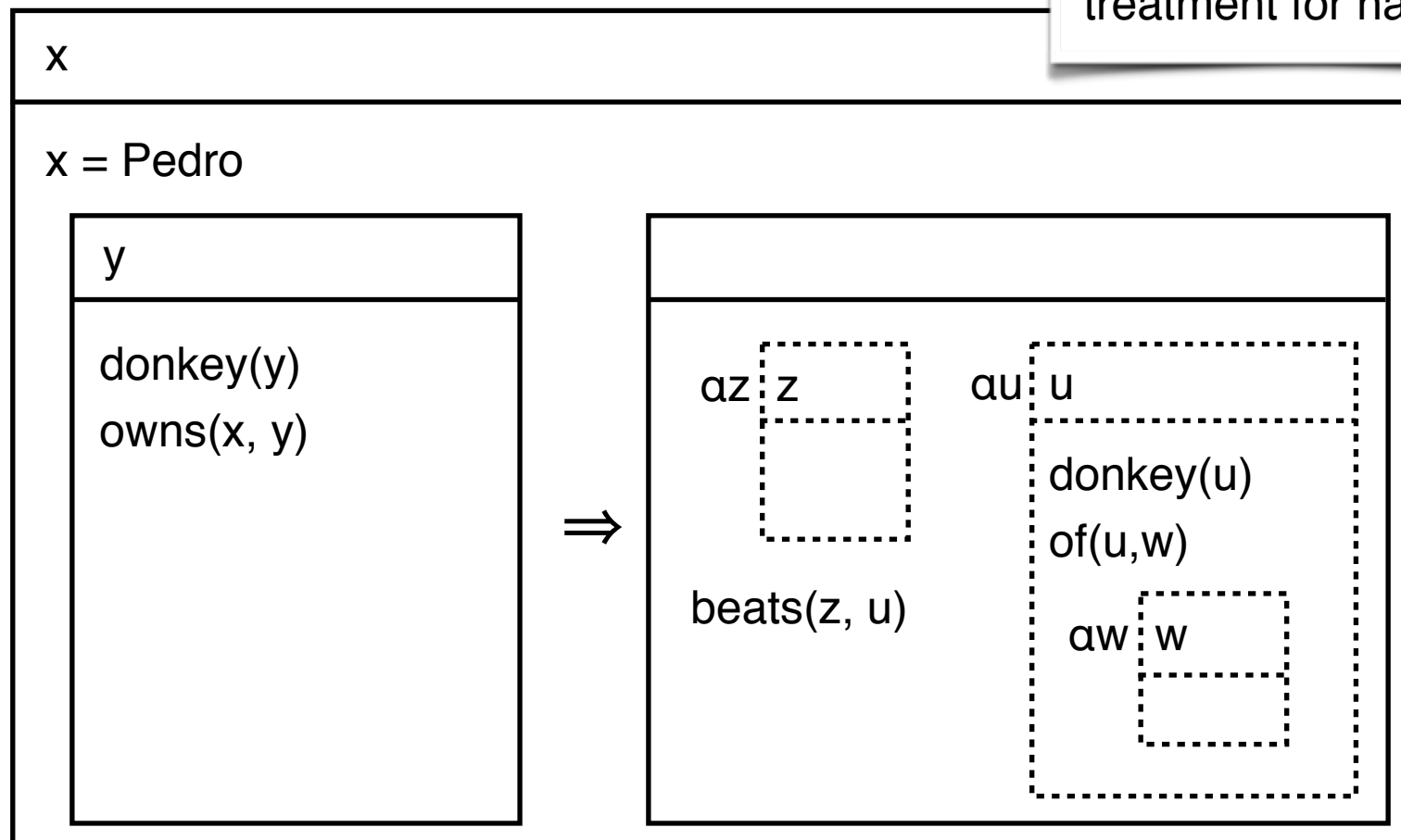- $y \in U_{Kt}$ is a DR that is accessible and suitable for γ

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.
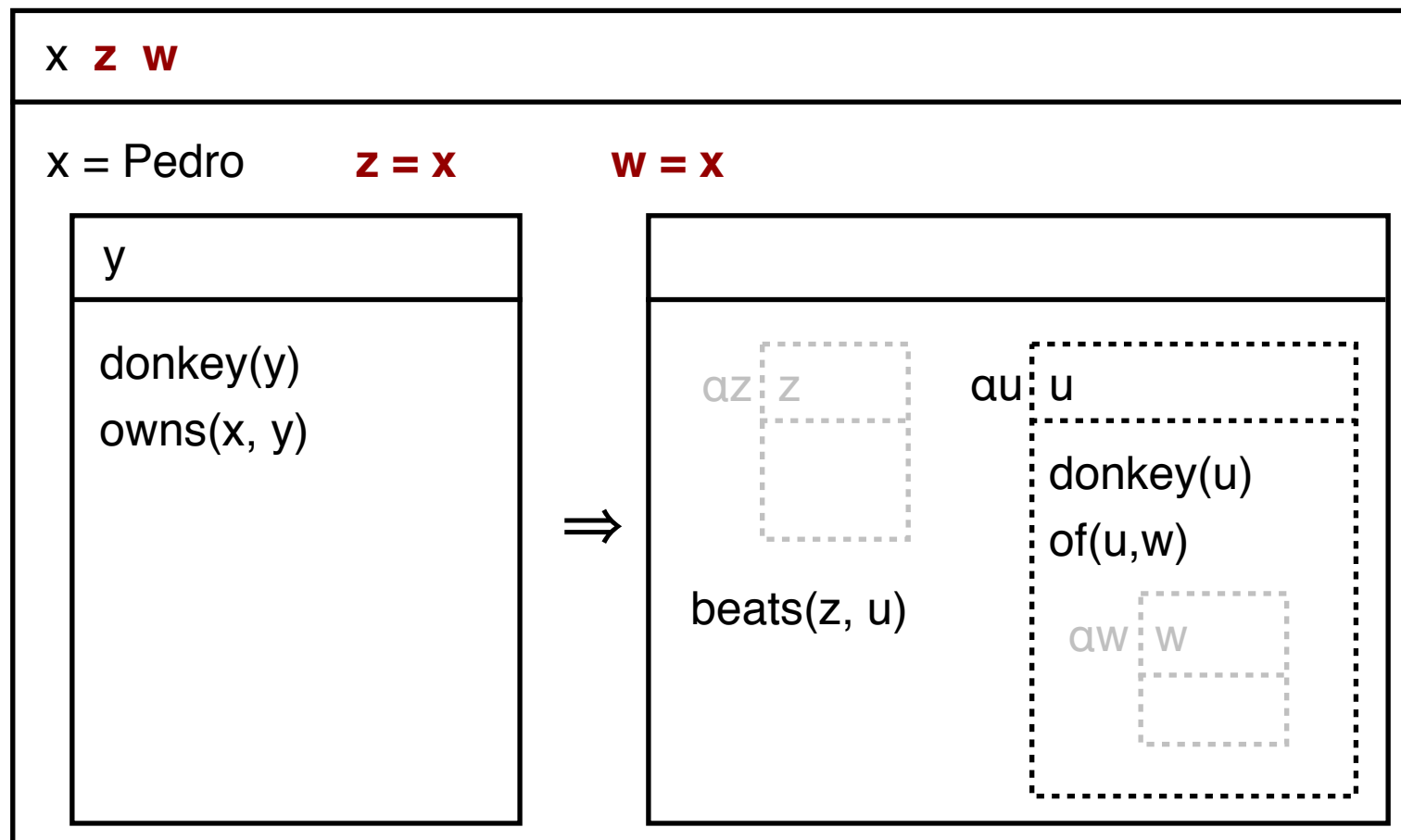
Resolution by binding: example

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

NB: we here use the standard DRS treatment for names

$$
\boxed{
\begin{array}{l}
x \\
\hline
x = \text{Pedro} \\
\left[
\begin{array}{l}
y \\
\hline
\text{donkey}(y) \\
\text{owns}(x, y)
\end{array}
\right]
\quad \Rightarrow \quad
\left[
\begin{array}{l}
\alpha z\, \boxed{z} \qquad \alpha u\, \boxed{u} \\[4pt]
\qquad\qquad\qquad \text{donkey}(u) \\
\qquad\qquad\qquad \text{of}(u,w) \\
\text{beats}(z, u) \quad \alpha w\, \boxed{w}
\end{array}
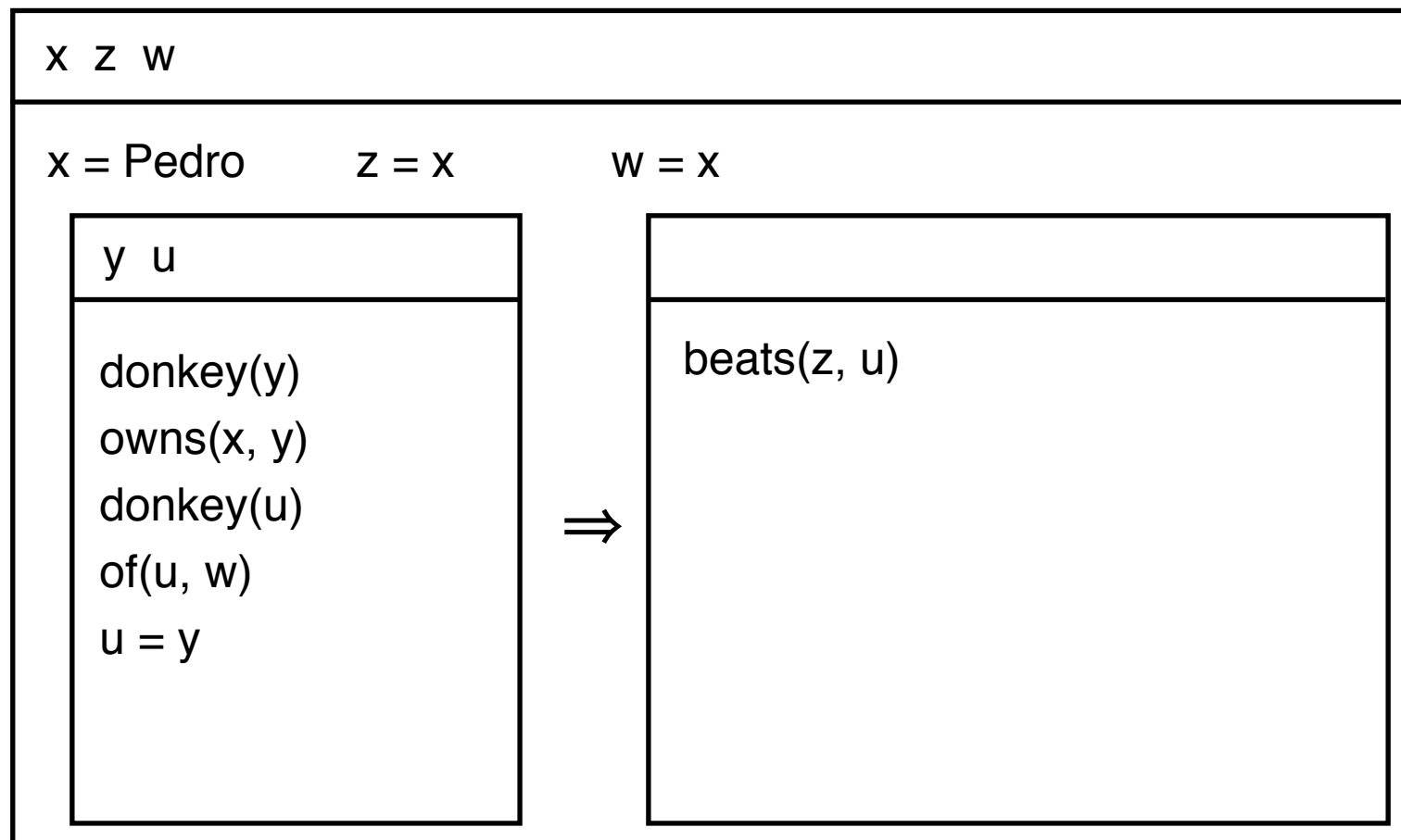\right]
\end{array}
}
$$

Resolution by binding: example

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

Resolution by binding: example

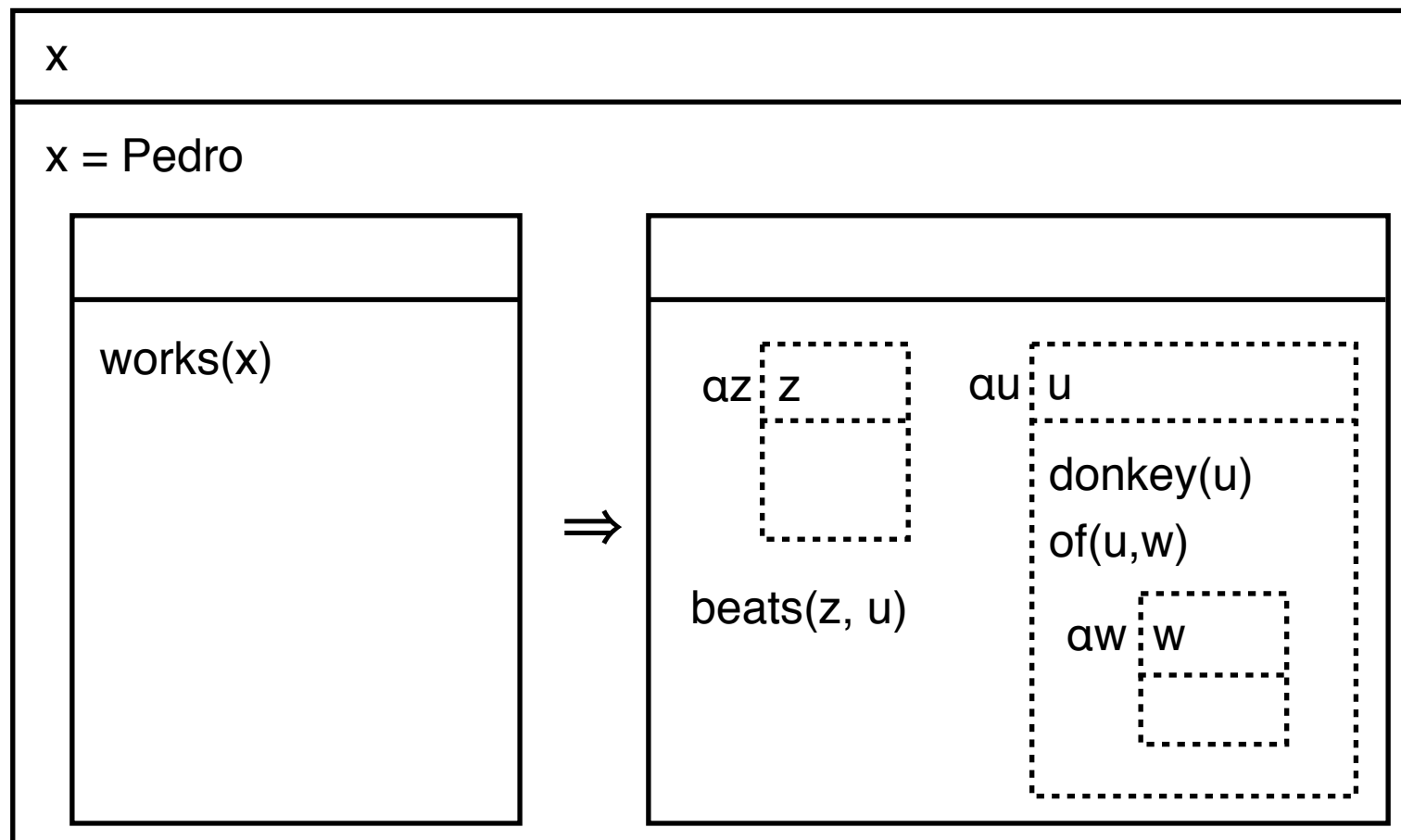- *If Pedro owns a donkey, he beats his donkey.*

Resolution by binding: example

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

x z w

x = Pedro   z = x   w = x

y u

donkey(y)
owns(x, y)
donkey(u)
of(u, w)
u = y

$\Rightarrow$

beats(z, u)
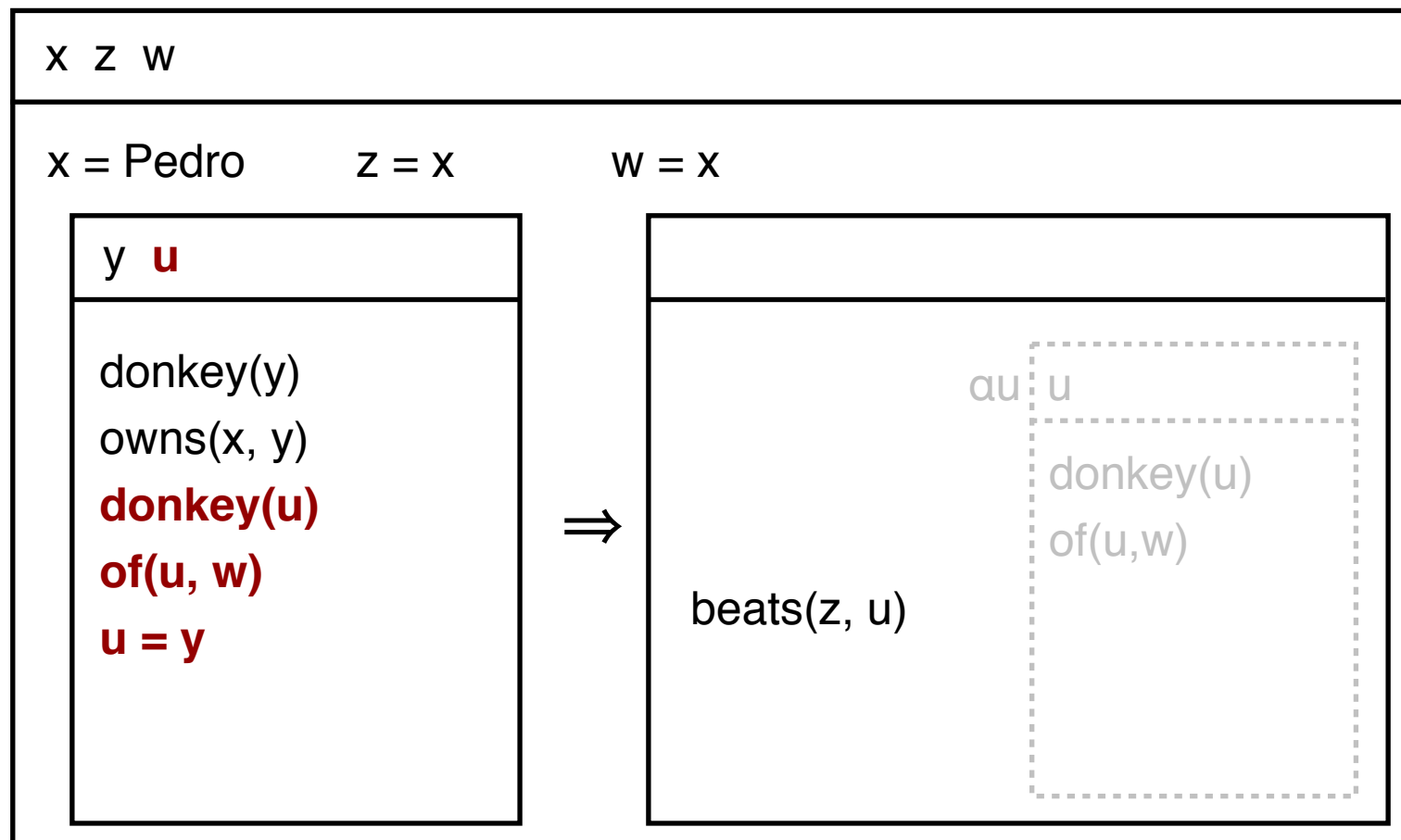
Resolution by accommodation

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: example

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

x

x = Pedro

works(x)

$\Rightarrow$

αz z

beats(z, u)
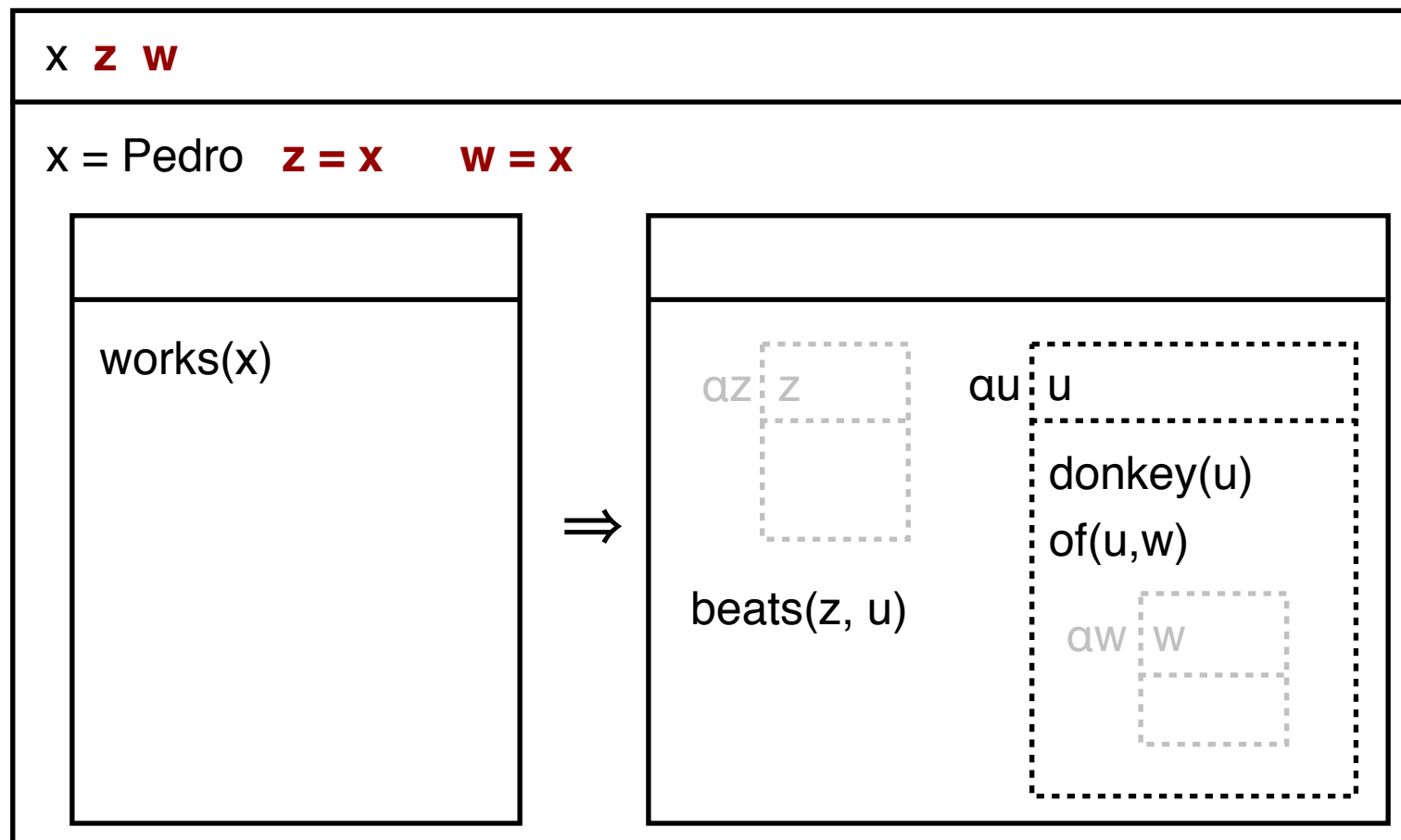
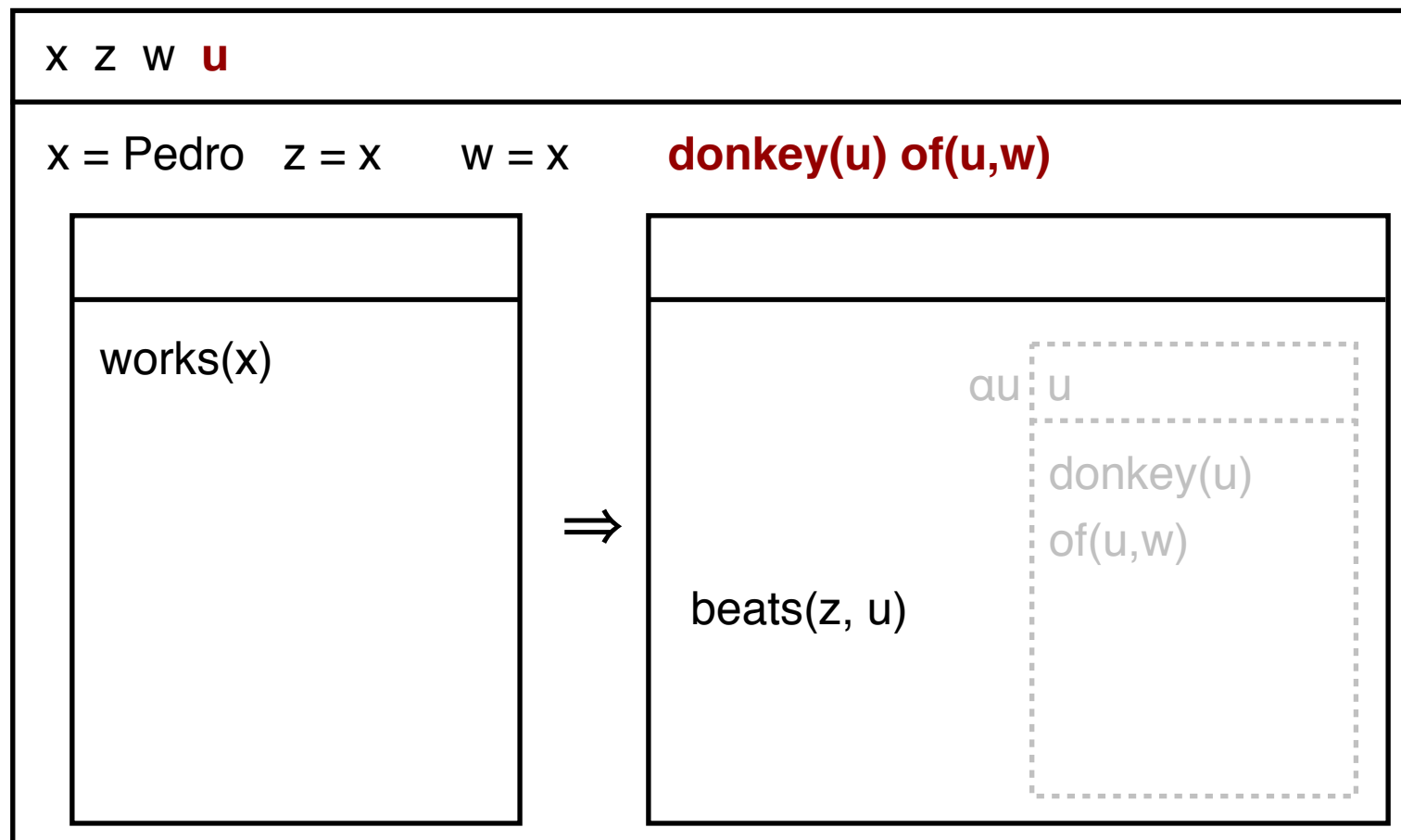αu u

donkey(u)
of(u,w)

αw w

Resolution by accommodation: example

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

Resolution by accommodation: example

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

x z w **u**

x = Pedro   z = x   w = x   **donkey(u) of(u,w)**

works(x)

⇒

beats(z, u)

αu ⁝ u

donkey(u)
of(u,w)

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.

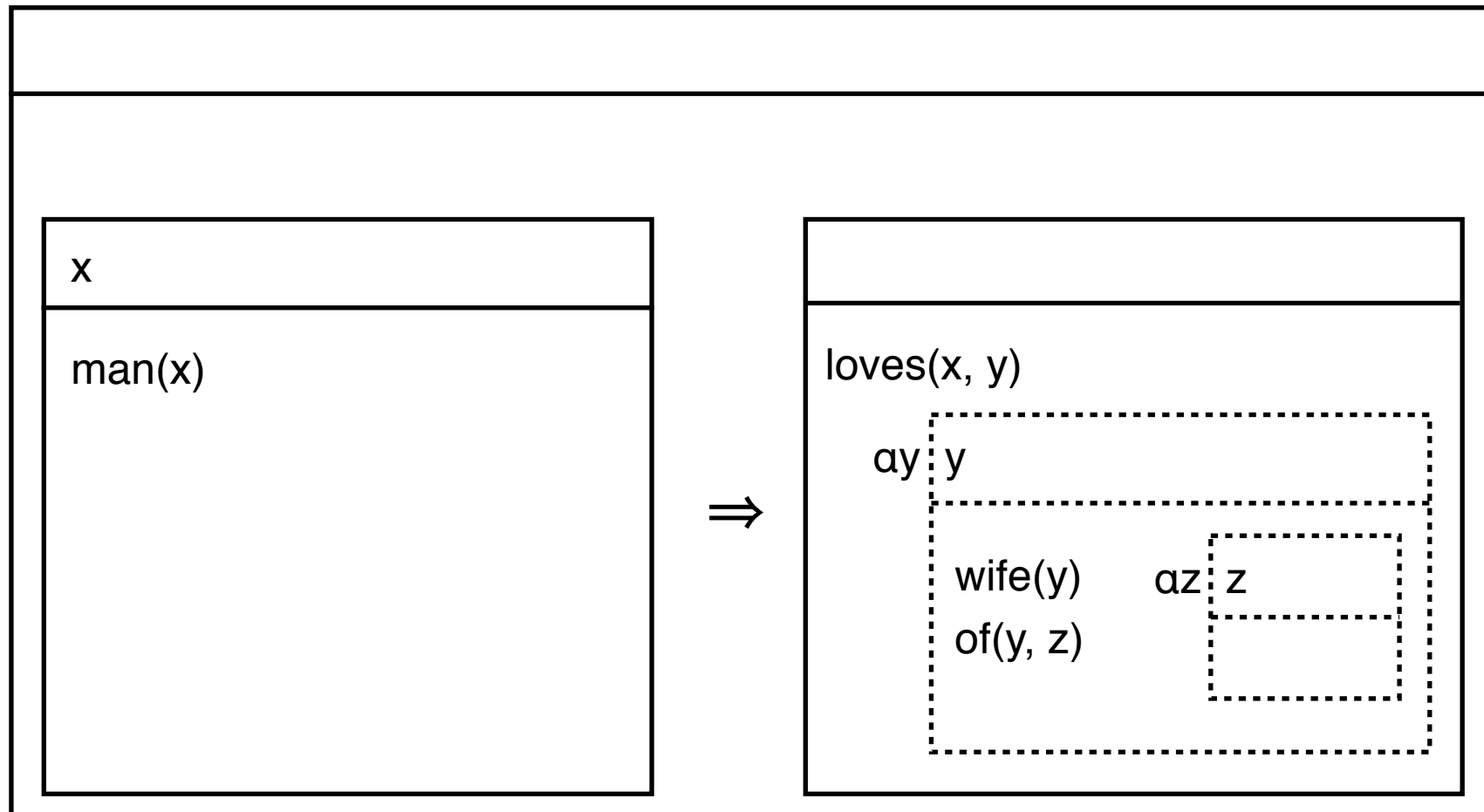# Constraints on projection

Free variable constraint:

The resolved DRS may not contain any free discourse referents.

Consistency and informativity constraints:

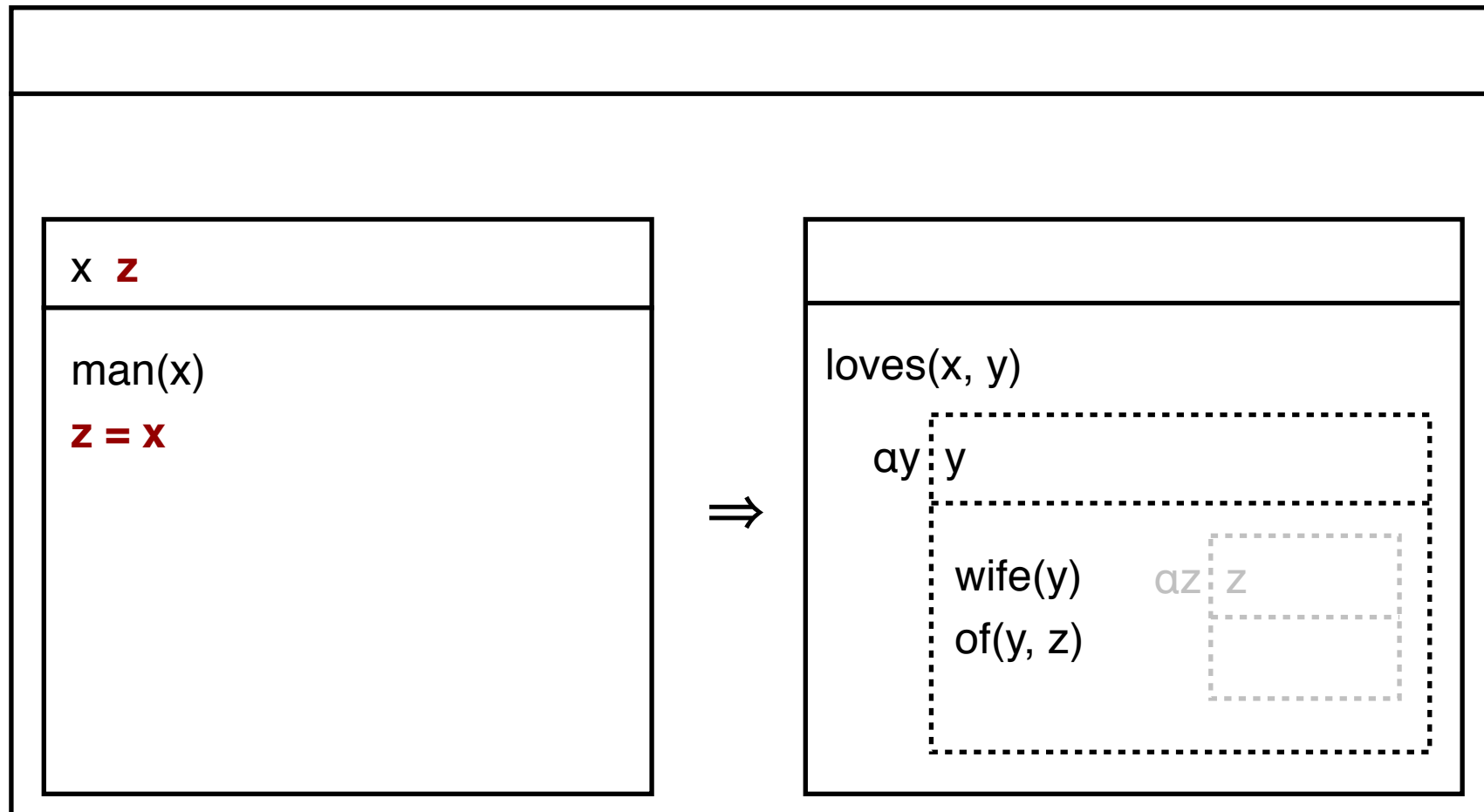The resolved DRS must be consistent and informative

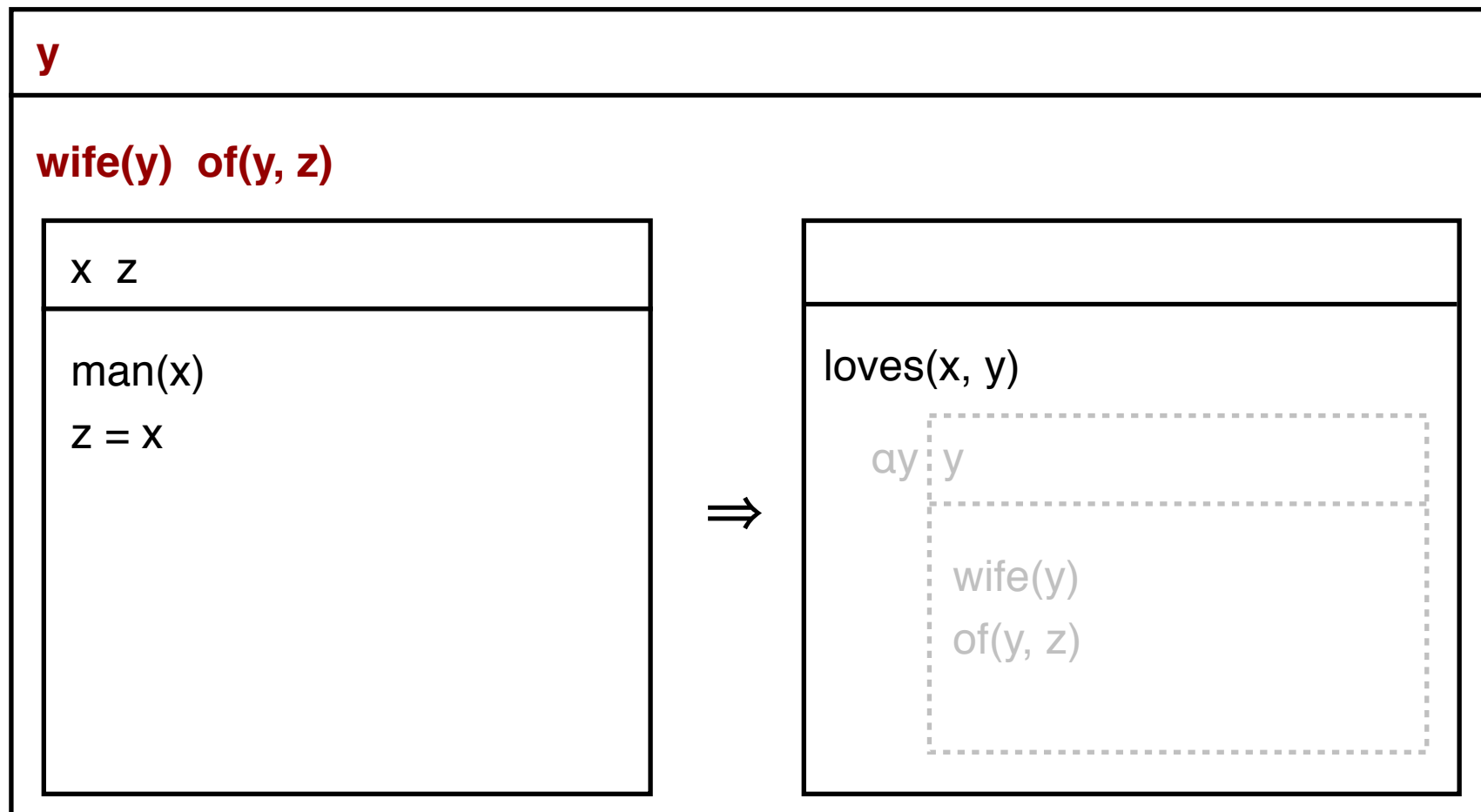# Free variable constraint: example

- *Every man loves his wife.*

Free variable constraint: example

- *Every man loves his wife.*

x **z**

man(x)
z = x

$\Rightarrow$

loves(x, y)

αy y

wife(y)   αz z
of(y, z)

Free variable constraint: example

- *Every man loves his wife.*

y

wife(y) of(y, z)

x z
man(x)
z = x

$\Rightarrow$

loves(x, y)
ɑy y
wife(y)
of(y, z)

Free variable constraint: example

- *Every man loves his wife.*
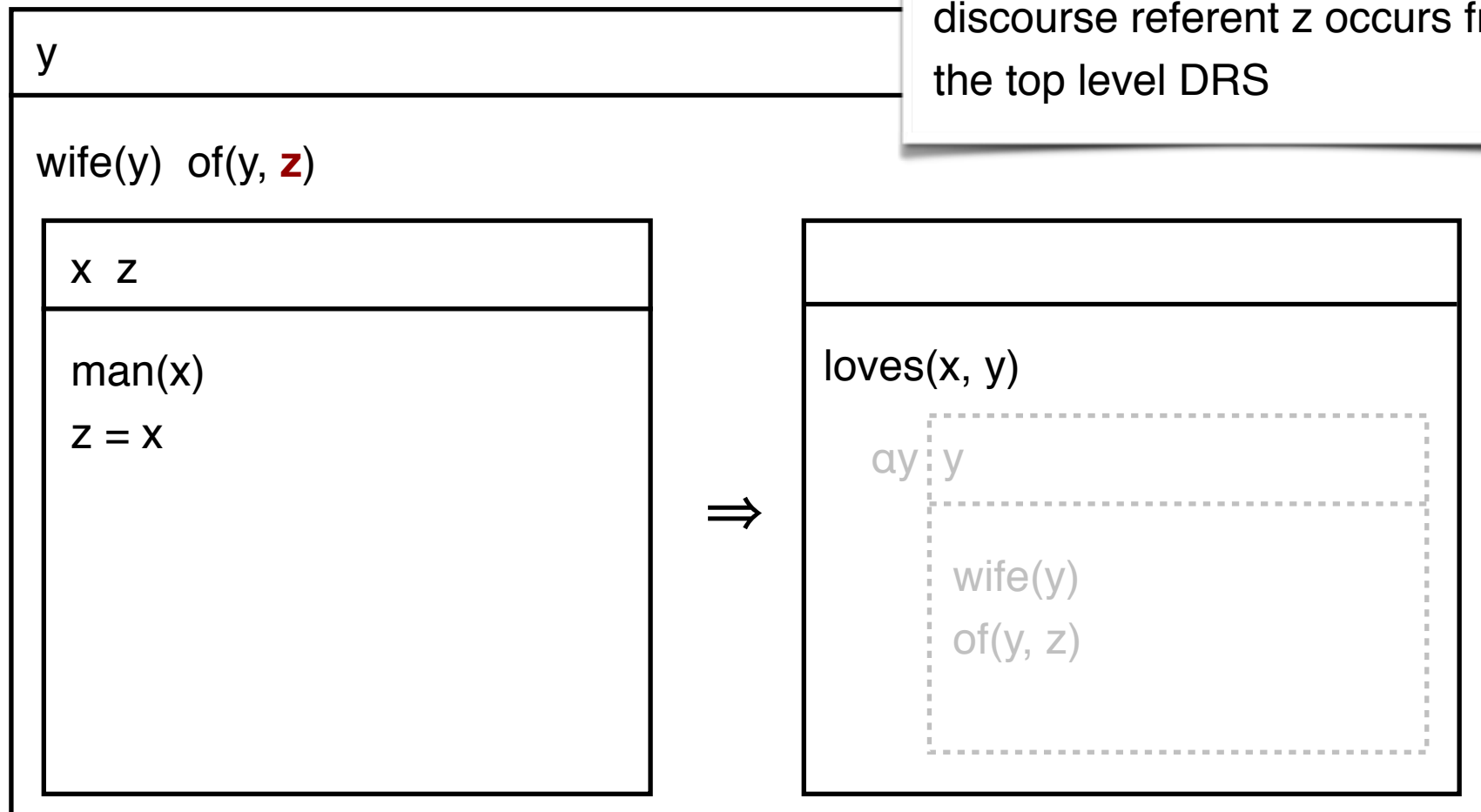
Inadmissible resolution: discourse referent z occurs free in the top level DRS

y

wife(y) of(y, **z**)

x z

man(x)

z = x

$\Rightarrow$

loves(x, y)

αy y

wife(y)

of(y, z)

Free variable constraint: example

- *Every man loves his wife.*

Instead: (local) accommodation in the antecedent DRS.

x   z   **y**

man(x)
z = x
wife(y)
of(y, z)

$\Rightarrow$

loves(x, y)

αy   y

wife(y)
of(y, z)
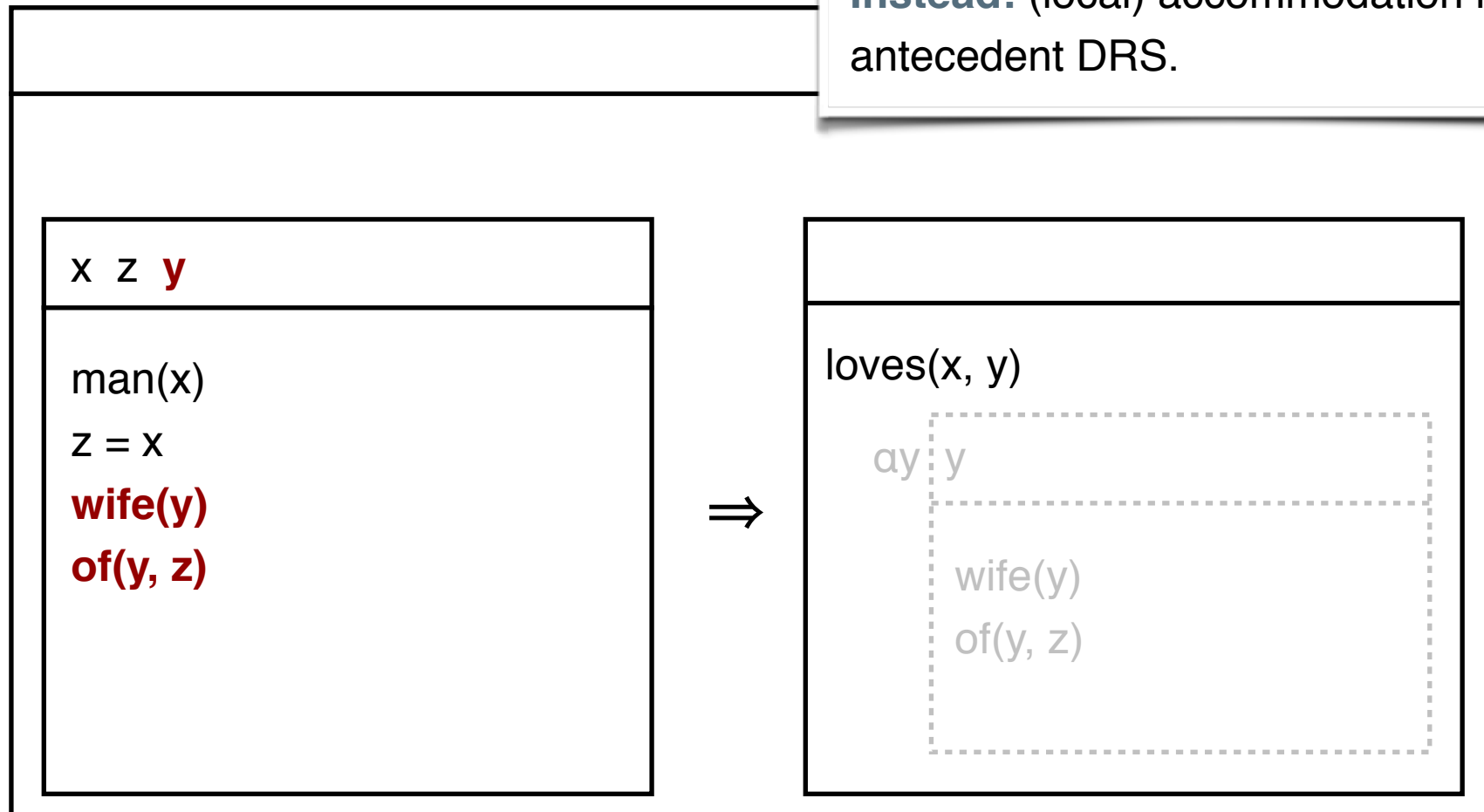
Further constraints on projection

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.

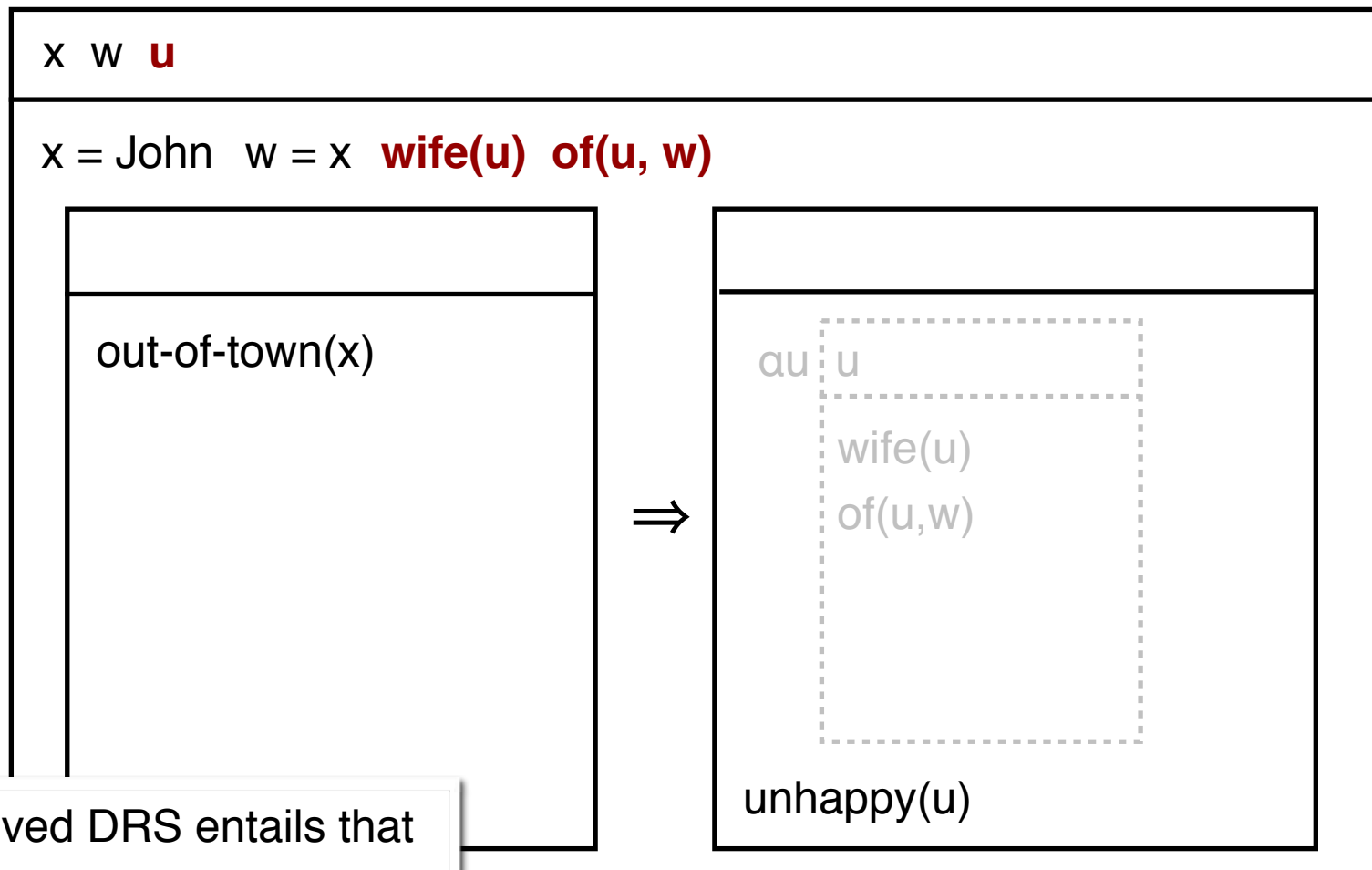- **Local informativity:** No sub-DRS must be entailed by any superordinate DRS.

(Local) Informativity: example

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

(Local) Informativity: example

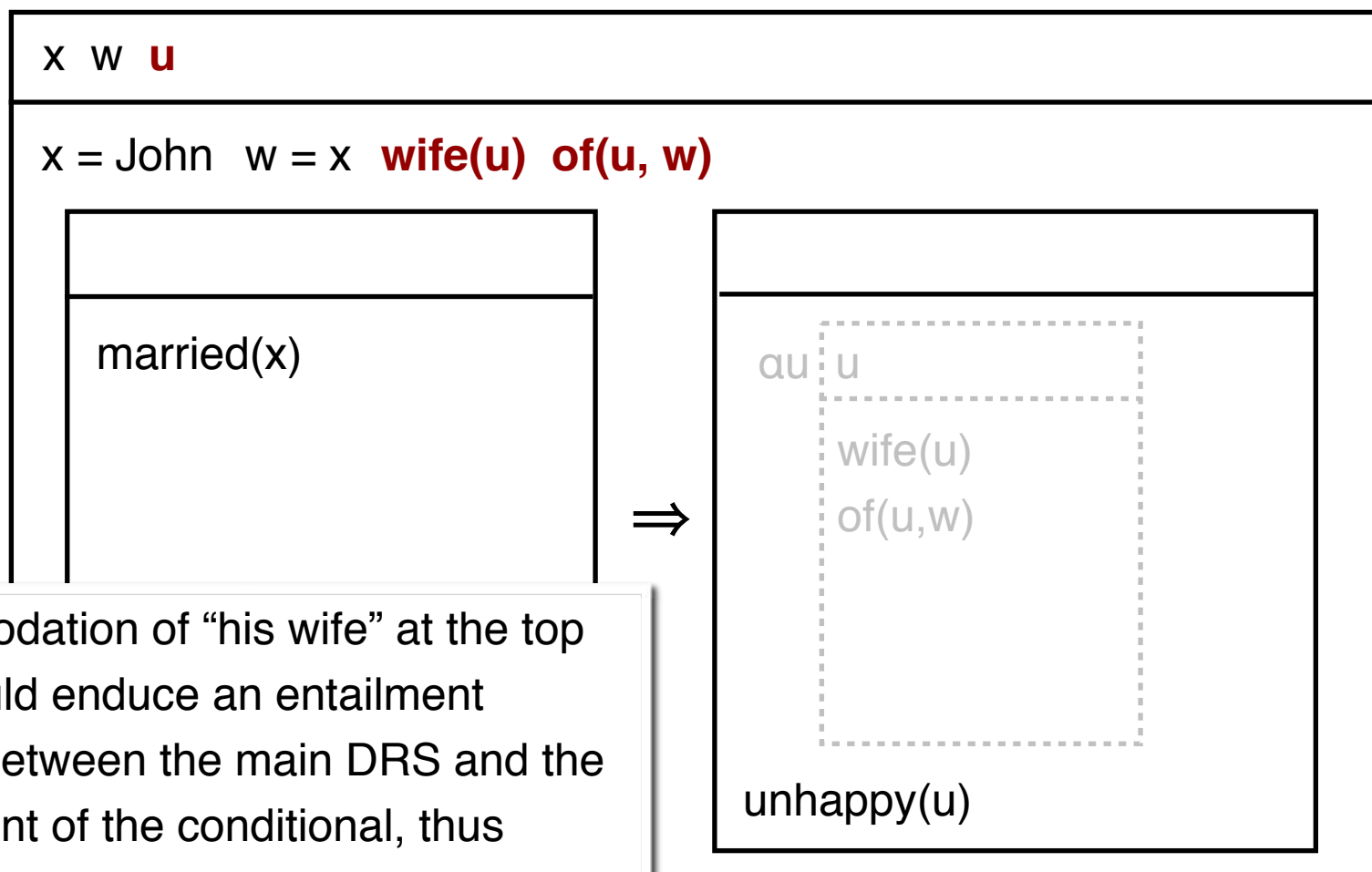- *If John is out of town, his wife is unhappy.* » John is married

x w **u**
x = John   w = x   **wife(u) of(u, w)**

out-of-town(x)

$\Rightarrow$

αu : u

wife(u)

of(u,w)
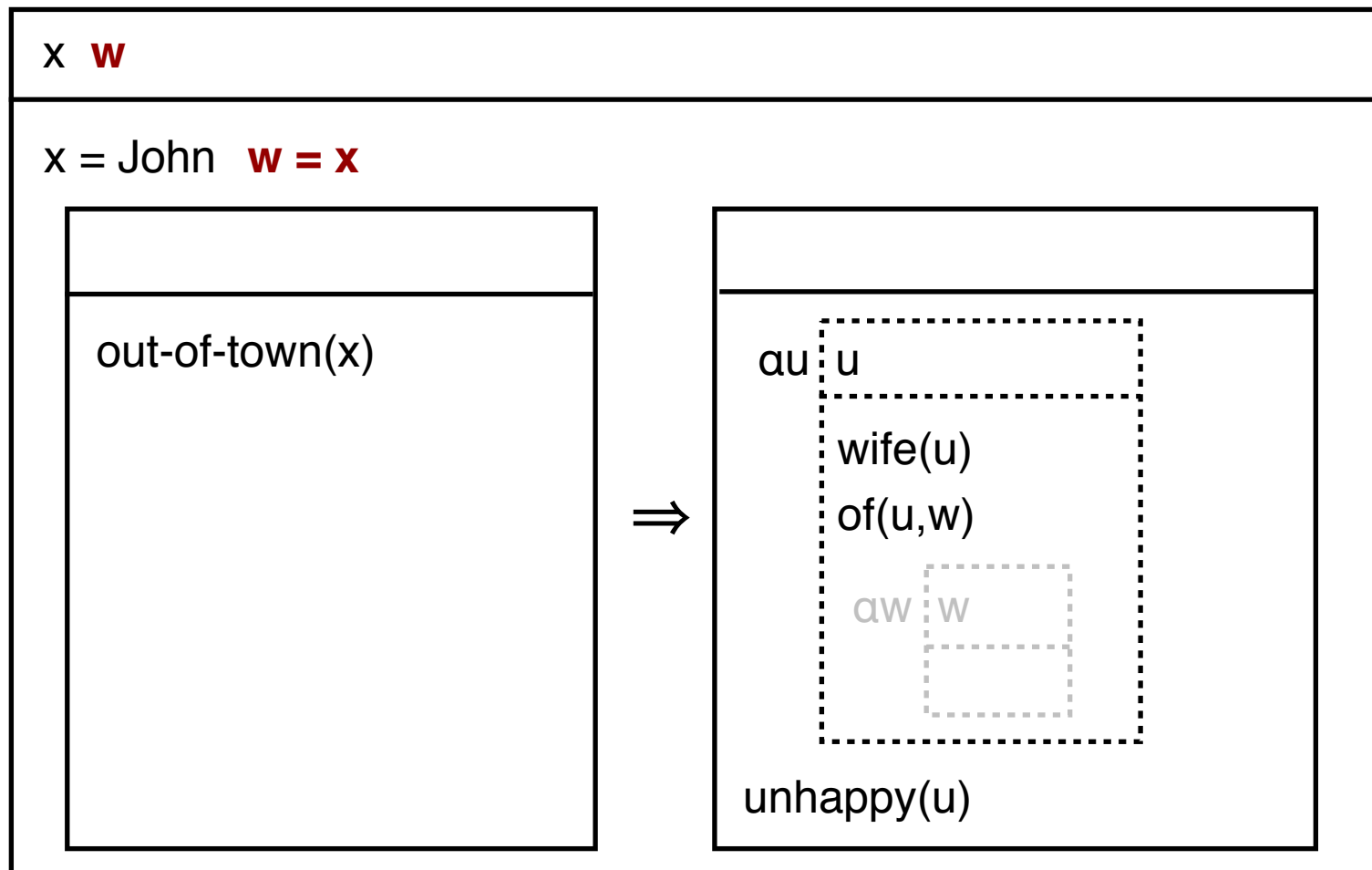
unhappy(u)

The resolved DRS entails that John has a wife.

(Local) Informativity: example

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

x w **u**
x = John   w = x **wife(u) of(u, w)**

married(x)
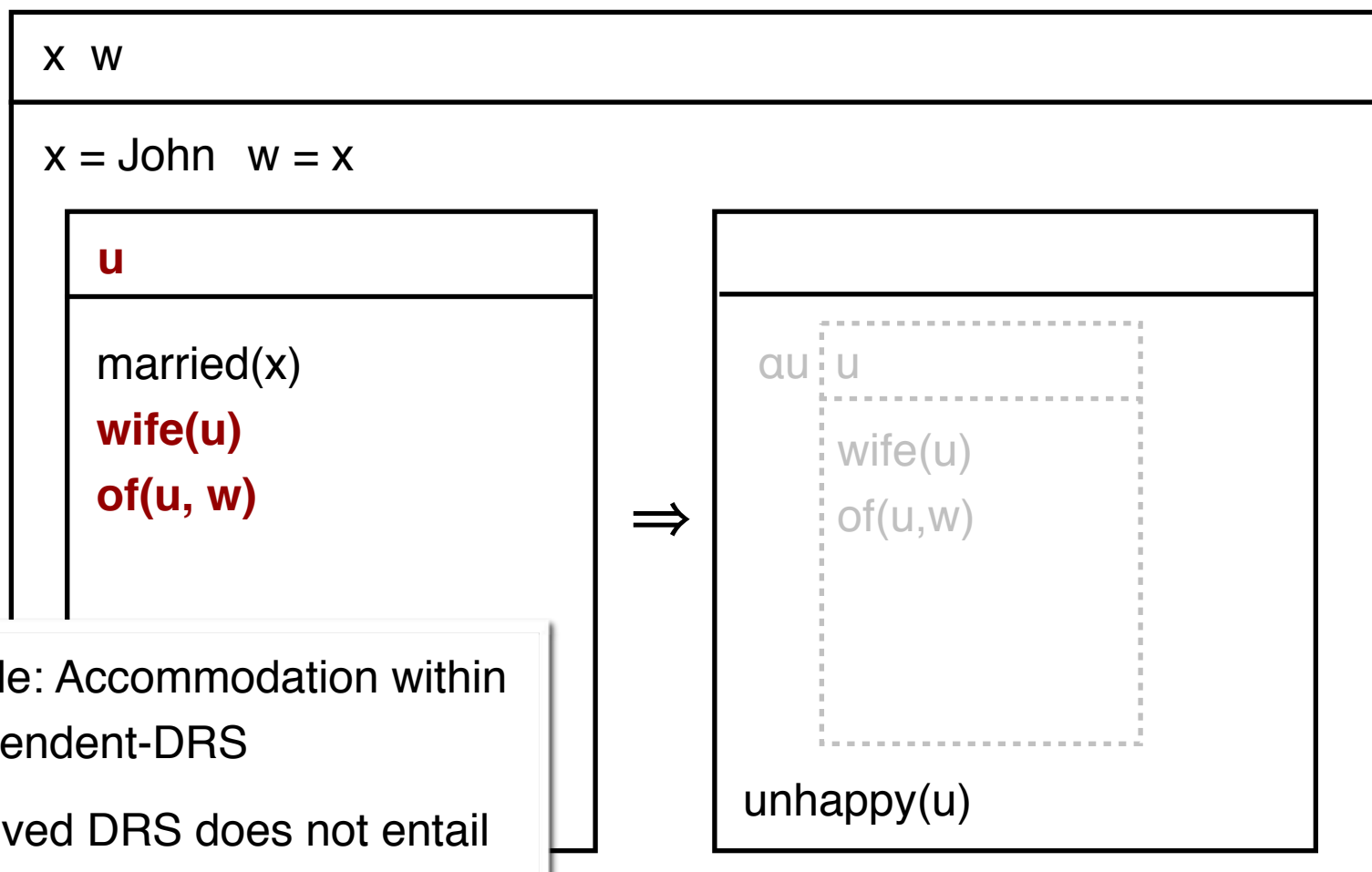
⇒

αu u

wife(u)

of(u,w)

unhappy(u)

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: example

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

x w

x = John   w = x

u
married(x)
wife(u)
of(u, w)

⇒

αu   u

wife(u)

of(u,w)

unhappy(u)

Admissible: Accommodation within the antecendent-DRS

The resolved DRS does not entail that John has a wife.

Evaluation of the DRT analysis of presuppositions

Pros:

- Empirically sound representations

- Unified treatment of presuppositions and anaphora

- Structural explanation of filtering/cancellation principles

Cons:

- Two-stage resolution procedure for presuppositions not compositional

- Once resolved, presuppositions loose their 'presuppositionhood'

- Does not explain projection behaviour of other phenomena: for instance, conventional implicatures

Conventional Implicatures

- *Noam Chomsky, a famous linguist, attended the conference.*

Assertion: Noam Chomsky attended the conference

Conventional implicature: Noam Chomsky is a famous linguist

part of the conventional meaning of words/constructions (as opposed to usage)

not part of the truth-conditions of the sentence as a whole

Grice 1975; Potts 2003, 2005

Examples of conventional implicatures

(1) Ames, the former spy, is now behind bars.   appositive

(2) Ames, who stole from the FBI, is now behind bars.   non-restrictive relative clause

(3) Ames was, as the press reported, a successful spy.   as-clause

(4) Fortunately, Beck survived the descent.   parenthetical

(5) Frankly (speaking), Ed fled.   utterance modifier

(6) I hate your damn dog!   expressive adverb

(7) That bastard Conner got promoted.   epithet

(8) Yamadasensei -ga o -warai-ni nat-ta.   honorific
    Yamada teacher - nom hon - laugh - dat be - perf
    'Professor Yamada laughed.' honorific

Potts 2003, 2005

Properties of conventional implicatures

Conventional implicatures are…

- *non-cancellable:* they cannot be directly denied

- *not at-issue:* CIs are not part of the regular asserted content

- *scopeless:* CIs project, and are not sensitive to 'presupposition plugs' (such as propositional attitude verbs)

- *speaker-oriented:* the speaker of a sentence containing a CI-trigger is committed to the CI content

Conventional implicatures versus presuppositions

- Karttunen & Peters (1979): presuppositions are a special case of conventional implicatures, namely, those which, for pragmatic reasons, are presumed to true already.

- Potts (2005): conventional implicatures are distinguished from presuppositions in that they introduce new information, motivating a *multi-dimensional* approach to meaning

- Simons et al. (2010): Presuppositions and conventional implicatures belong to the larger class of not at-issue content.

Q: How to provide a unified formal treatment of projection?

Literature

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

- Christopher Potts (2005). *The logic of conventional implicatures* Oxford Studies in Theoretical Linguistics. Oxford: Oxford University Press.