Semantic Theory

Week 9: Presupposition

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Back to: Entailment

A sentence A entails a sentence B (A ⊨ B)
***iff* whenever A is true, then B must also be true.**

Entailment is a relation between the *propositions* expressed by the two sentences A and B:

(1) John and Mary failed the test ⊨ Mary failed the test

(2) John or Mary failed the test ⊨ Someone failed the test

(3) John is an intelligent student ⊨ John is a student

(4) Every student works ⊨ Every blond student works

More examples of entailment?

(1) The mathematician who proved Goldbach's conjecture was a woman ⊨? Someone proved Goldbach's conjecture

(2) Mary loves her husband ⊨? Mary has a husband / is married

(3) It was Mary who broke the typewriter ⊨? Somebody broke the typewriter

(4) John kissed every girl at the party ⊨? There were girls at the party

(Examples (1), (3) from von Fintel)

Entailment vs. Presupposition

Entailment:

(1) John and Mary failed the test ⊨ Mary failed the test

(2) It's not the case that John and Mary failed the test ⊭ Mary failed the test

Presupposition:

(3) The mathematician who proved Goldbach's conjecture was a woman ⊨ Someone proved Goldbach's conjecture

(4) It's not the case that the mathematician who proved Goldbach's conjecture was a woman ⊨ Someone proved Goldbach's conjecture

What are presuppositions?

Different formulations

"A presupposition of a statement is a proposition that must be true in order for the statement to be interpretable (to make sense) in the first place."

"A presupposition is an implicit assumption about the world whose truth is taken for granted by the speaker."

Back to: definite descriptions

Definite descriptions convey uniqueness

(1) *The chancellor decides.* ⇝ “there is exactly one chancellor, and he decides”

↦ **∃x(∀y(chancellor’(y) ↔ x = y) ∧ decide’(x))**

the chancellor ↦ λG∃x(∀y(chancellor’(y) ↔ x = y) ∧ G(x))

the ↦ λFλG∃x(∀y(F(y) ↔ x = y) ∧ G(x))

Definite descriptions and uniqueness

A problem for compositionality

(2) *It is not the case that the chancellor decides*

Compositional analysis of the sentence leads to:

> **¬∃x(∀y(chancellor'(y) ↔ x = y) ∧ decide'(x))**
>
> ⇝ "Either there is no chancellor, or more than one, or there is exactly one chancellor and he doesn't decide"

But… the correct representation for the sentence should be:

> **∃x(∀y(chancellor'(y) ↔ x = y) ∧ ¬decides'(x))**
>
> ⇝ "There is exactly one chancellor, and he doesn't decide."

Presupposition versus Assertion

Two types of meaning information

A sentence (e.g. one containing a definite description) contains meaning information of (at least) two different types:

Presupposition: the requirements that the context must satisfy for the sentence to be interpretable at all.

Assertion: the claims that are made, based on the context.

(1) *The chancellor decides*

$\exists x(\forall y(\text{chancellor}'(y) \leftrightarrow x=y) \wedge \text{decides}'(x))$

“There is exactly one chancellor, and he decides.”

Presupposition projection

Presuppositions are not affected by negation

(2) *It is not the case that the chancellor decides*

∃x(∀y(chancellor'(y) ↔ x=y) ∧ ¬decides'(x))

"There is exactly one chancellor, and he doesn't decide."

- Being in the **syntactic scope** of negation does not affect presuppositions
- Presuppositions are interpreted as if introduced outside the scope of the negation; this is called **presupposition projection**
- We can use the property of projection to test for presuppositions.

Examples of presupposition triggers (1/3)

Definite descriptions

(1) *The king of France is bald.* » *There is a unique king of France*

(2) *Mary loves her husband* » *Mary has a husband*

(3) *Mary's brother bought a house* » *Mary has a brother*

Quantifiers

(4) *John kissed every girl at the party* » *There were girls at the party*

[Notation: "A » B" means "A presupposes B"]

Examples of presupposition triggers (2/3)

Factive verbs (regret, realise, being aware, …)

(5) *John regrets that Pola is married* » *Pola is married*

(6) *John realised that he was in debt* » *John was in debt*

Implicative verbs (manage to, forget to, …)

(7) *John forgot to close the door* » *John intended to close the door*

(8) *John managed to close the door* » *John tried to close the door*

Examples of presupposition triggers (3/3)

Aspectual verbs and items

(9) *John has stopped smoking* » *John used to smoke*

(10) *John opened the window again* » *The window was open*
or: The window was opened by John before

It-Clefts

(11) *It was John who ate the cake* » *Somebody ate the cake*

Sentence particles

(12) *Only John came to the party* » *John came to the party*

More Presupposition Projection

Presuppositions do not only “survive” negation, but also other kinds of embeddings:

(1) *The chancellor decides or the states’ prime ministers decide*

» *There is a (exactly one) chancellor*

(2) *John possibly regrets that Mary is married*

» *Mary is married*

(3) *Mary believes that John has stopped smoking*

» *John used to smoke*

Presupposition Filtering

There are contexts that can “neutralise” or *filter* some presuppositions; they block projection of these presuppositions:

(1) *If John is out of town, then his wife is unhappy*

» *John has a wife / John is married*

(2) *If John is married, then his wife is unhappy*

» ~~*John is married*~~

(3) *If John is married, then his daughter is unhappy*

» *John has a daughter*

Presupposition Cancellation

In the context of negation, presuppositions can be overwritten or “cancelled” by explicitly claiming that they are false.

(1) *John doesn’t regret that Mary is married. Mary has no husband, and John knows that.*

(2) *It’s not the case that the king of France is bald. France is a republic.*

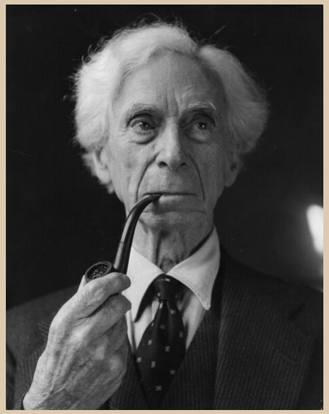
The Projection Problem:

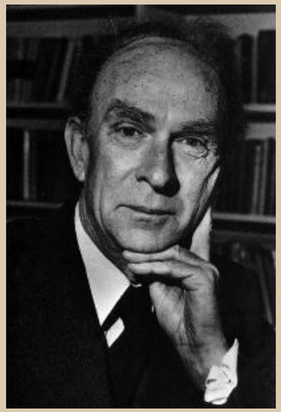
Under what conditions does a sentence containing a presupposition trigger inherit this presupposition?

Presuppositions and Compositionality:

How to explain the presuppositions of complex sentences in terms of the presuppositions of their parts?

The Russell-Strawson debate





- *The king of France is bald*

What truth-value should we assign to this sentence?

“False because there is no king of France”

Russell, B., 1905. “On Denoting,” *Mind*

“Undefined because we cannot check whether the statement is true or false”

Strawson, P.F., 1950. “On Referring,” *Mind*

The Russell-Strawson debate

Mr. Strawson, in spite of his very real logical competance, has a curious prejudice against logic. On page 43, he has a sudden dithyrambic outburst, to the effect that life is greater than logic, which he uses to give a quite false interpretation of my doctrines.

Leaving detail aside, I think we may sum up Mr. Strawson's argument and my reply to it as follows :

There are two problems, that of descriptions and that of egocentricity. Mr. Strawson thinks they are one and the same problem, but it is obvious from his discussion that he has not considered as many kinds of descriptive phrases as are relevant to the argument. Having confused the two problems, he asserts dogmatically that it is only the egocentric problem that needs to be solved, and he offers a solution of this problem which he seems to believe to be new, but which in fact was familiar before he wrote. He then thinks that he has offered an adequate theory of descriptions, and announces his supposed achievement with astonishing dogmatic certainty. Perhaps I am doing him an injustice, but I am unable to see in what respect this is the case.

BERTRAND RUSSELL

Russell, B., 1957. "Mr. Strawson on Referring," *Mind*

Intermediate Summary

Presuppositions: projection, filtering, cancellation

- 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).

Presuppositions as Anaphora

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 by means of **binding** and **accommodation**. This translates a proto-DRS into a standard DRS (with a model-theoretic interpretation).

Syntax for proto-DRSs

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

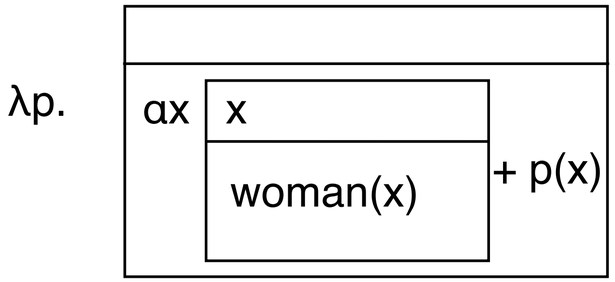
- U_K is a set of discourse referents
- C_K is a set of (atomic or complex) conditions
- A_K is a set of "anaphoric" (α-) DRSs of the form αzK', where z is a discourse referent and K' is a proto-DRS.

A **DRS** is a proto-DRS $\langle U_K, C_K, A_K \rangle$ with: $A_K = \varnothing$

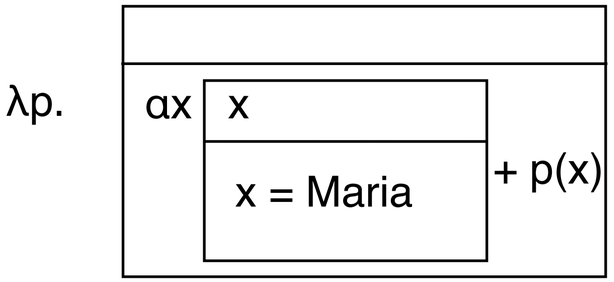
Definite Noun Phrases in DRT

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

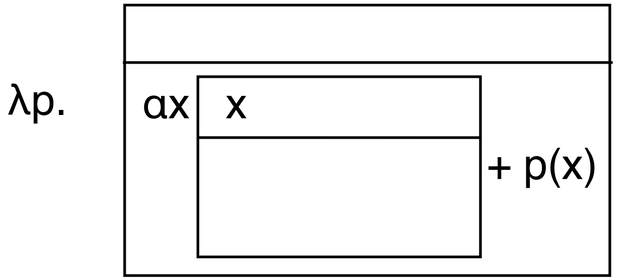
- Definite descriptions (“the woman”)



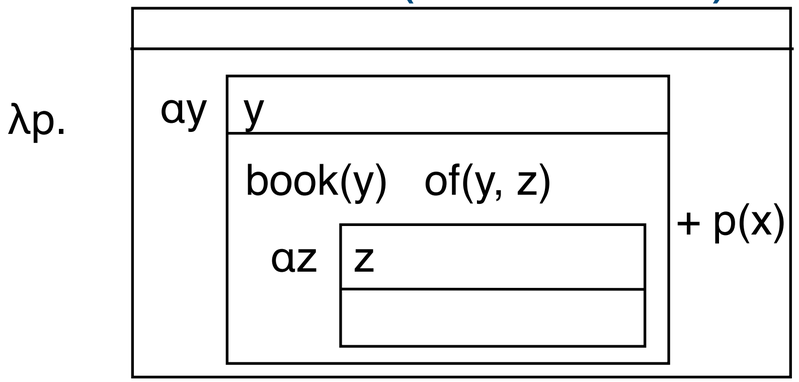
- Proper names (“Maria”)



- Pronouns (“he”)



- Possessives (“his book”)



Step 2: Presupposition Resolution

Resolution by Binding

Presuppositions often behave like anaphoric expressions

(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.*

Presuppositional content is attached to previously introduced information through *binding*

Recap: DRS Subordination

DRS K_1 is an **immediate sub-DRS** of a DRS $K = \langle U_K, C_K \rangle$ *iff*

- C_K contains a condition of the form:
  $\neg K_1$, $K_1 \Rightarrow K_2$, $K_2 \Rightarrow K_1$, $K_1 \vee K_2$ or $K_2 \vee K_1$.

DRS K_1 is a **sub-DRS** of DRS 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.

DRS K_1 is a **proper sub-DRS** of DRS K *iff*

- $K_1 \leq K$ and $K_1 \neq K$.

Resolution by Binding

Definition

Let K, K', K_t be some DRSs such that K' ≤ K, K_t ≤ 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.

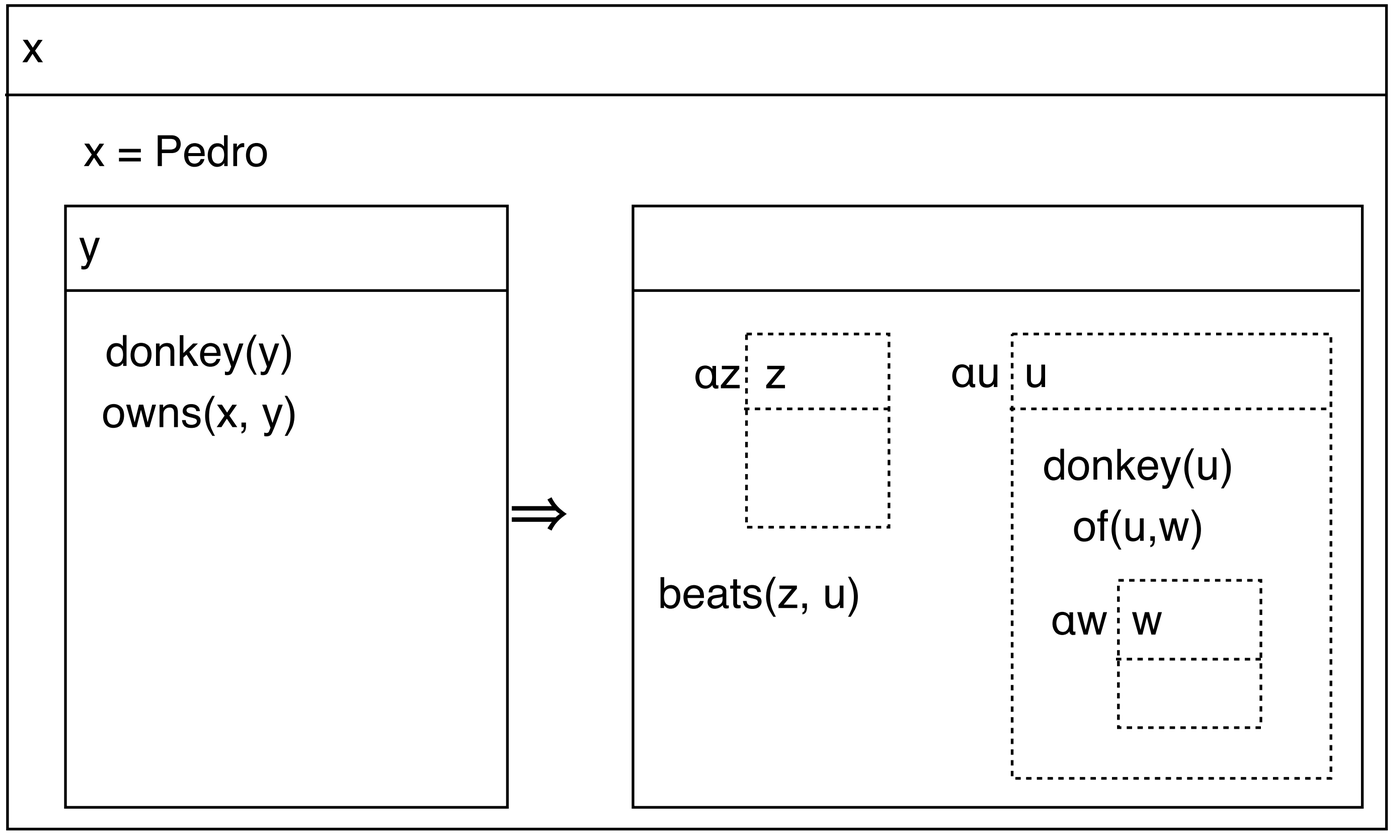
Note: Because K_s must be α-free, complex α-DRSs are always resolved from the inside out.

Resolution by Binding

Example

NB: we here use the standard DRT treatment for names

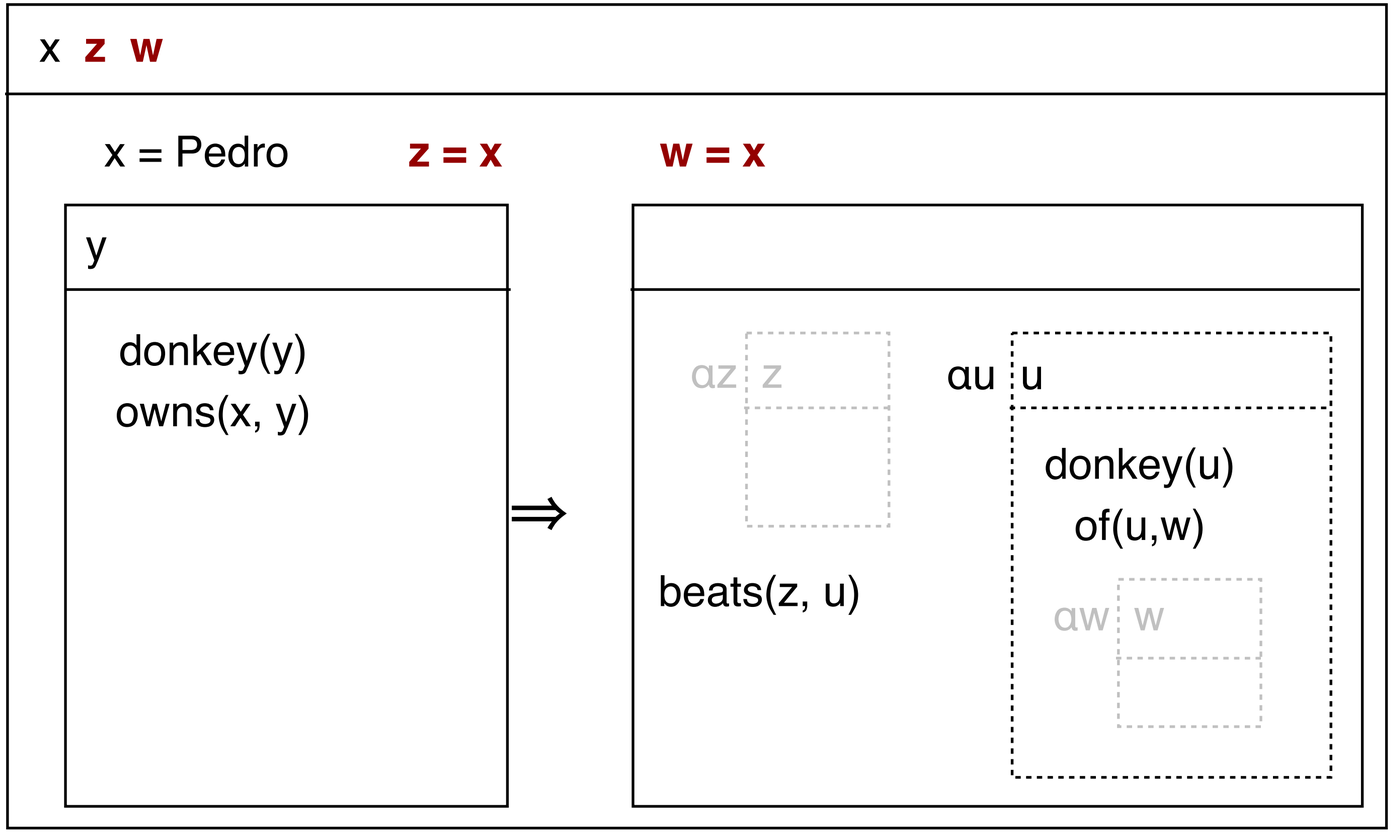
- *If Pedro owns a donkey, he beats his donkey.*



Resolution by Binding

Example

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



Resolution by Binding

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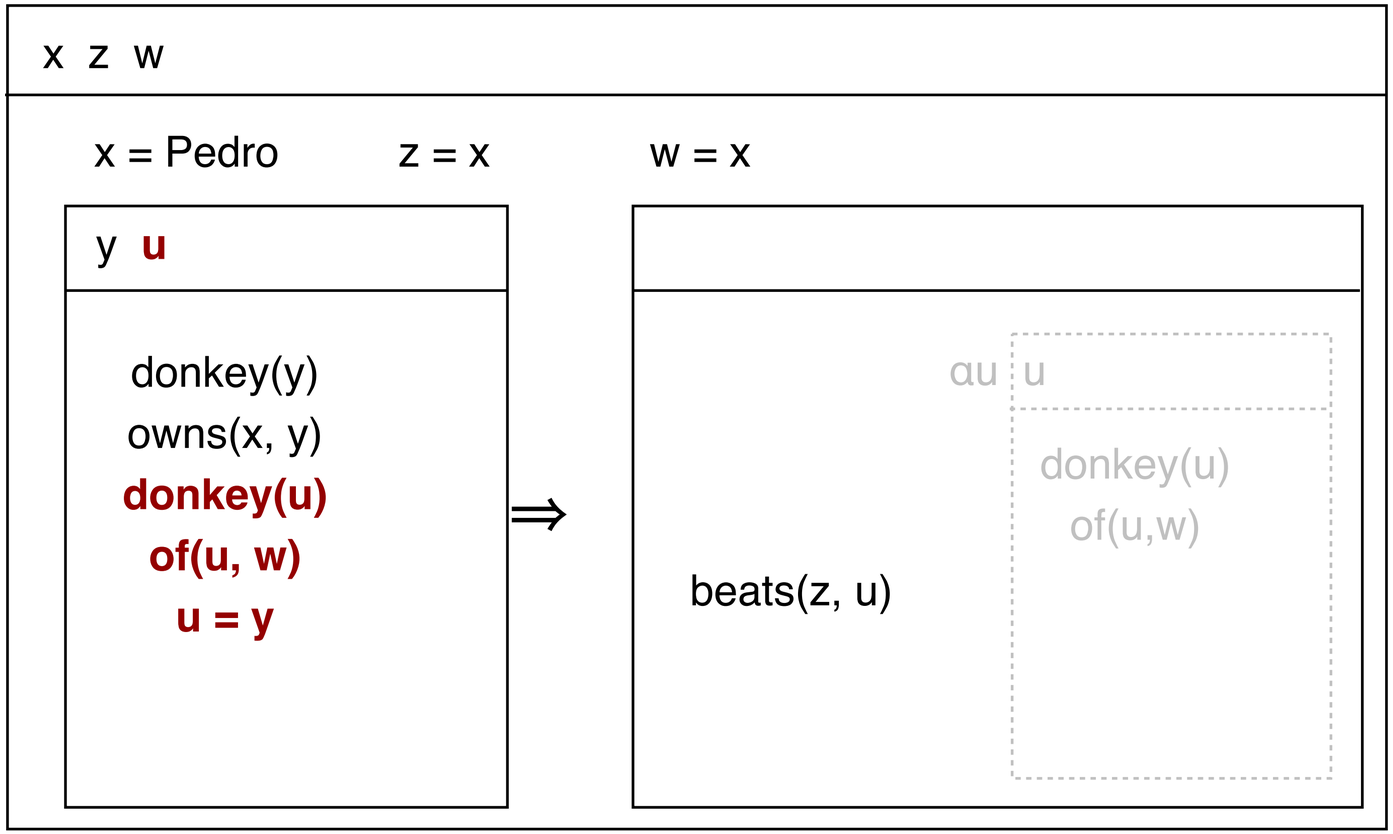

Resolution by Binding

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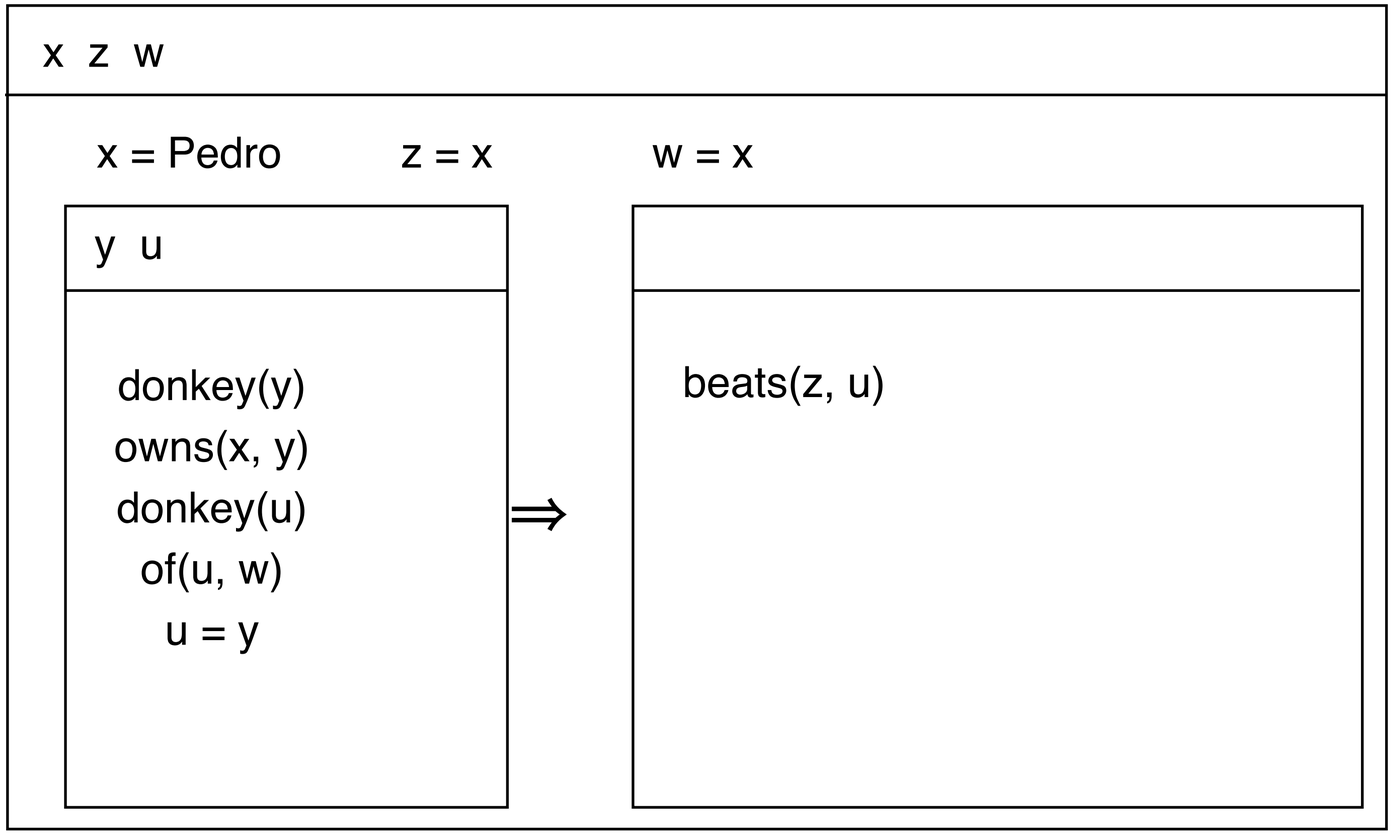


Step 2: Presupposition Resolution

Resolution by Accommodation

Unlike anaphora, presuppositional expressions can be used felicitously 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 by means of *accommodation*

Resolution by Accommodation

Definition

Let K, K', K_t be DRSs such that K' ≤ K, K_t ≤ K and

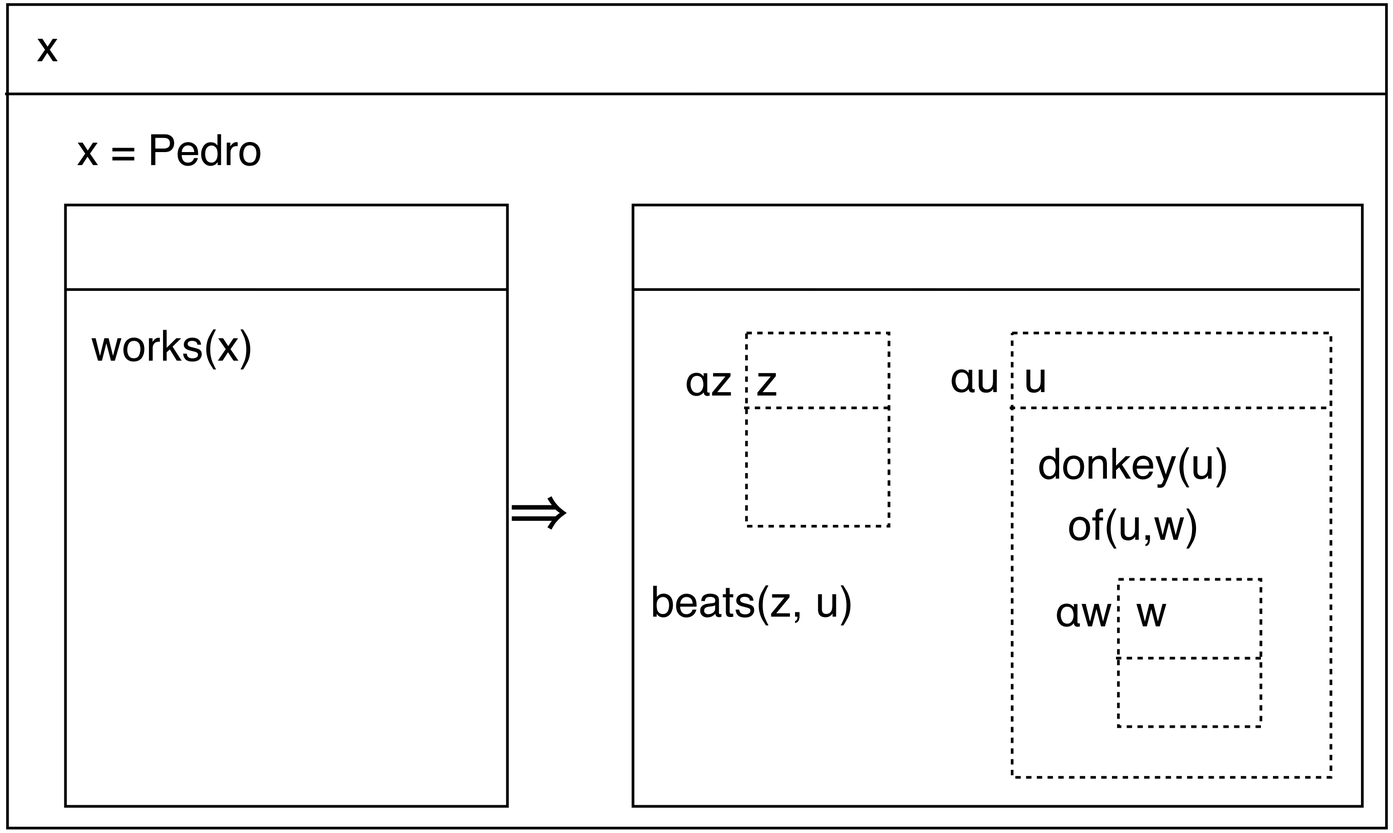
- γ = α x K_s ∈ K', K_s is α-free
- K_t a DRS that is accessible for γ.

Accommodation: Remove γ from K' and extend K_t with U_{Ks} and C_{Ks}.

Resolution by Accommodation

Example

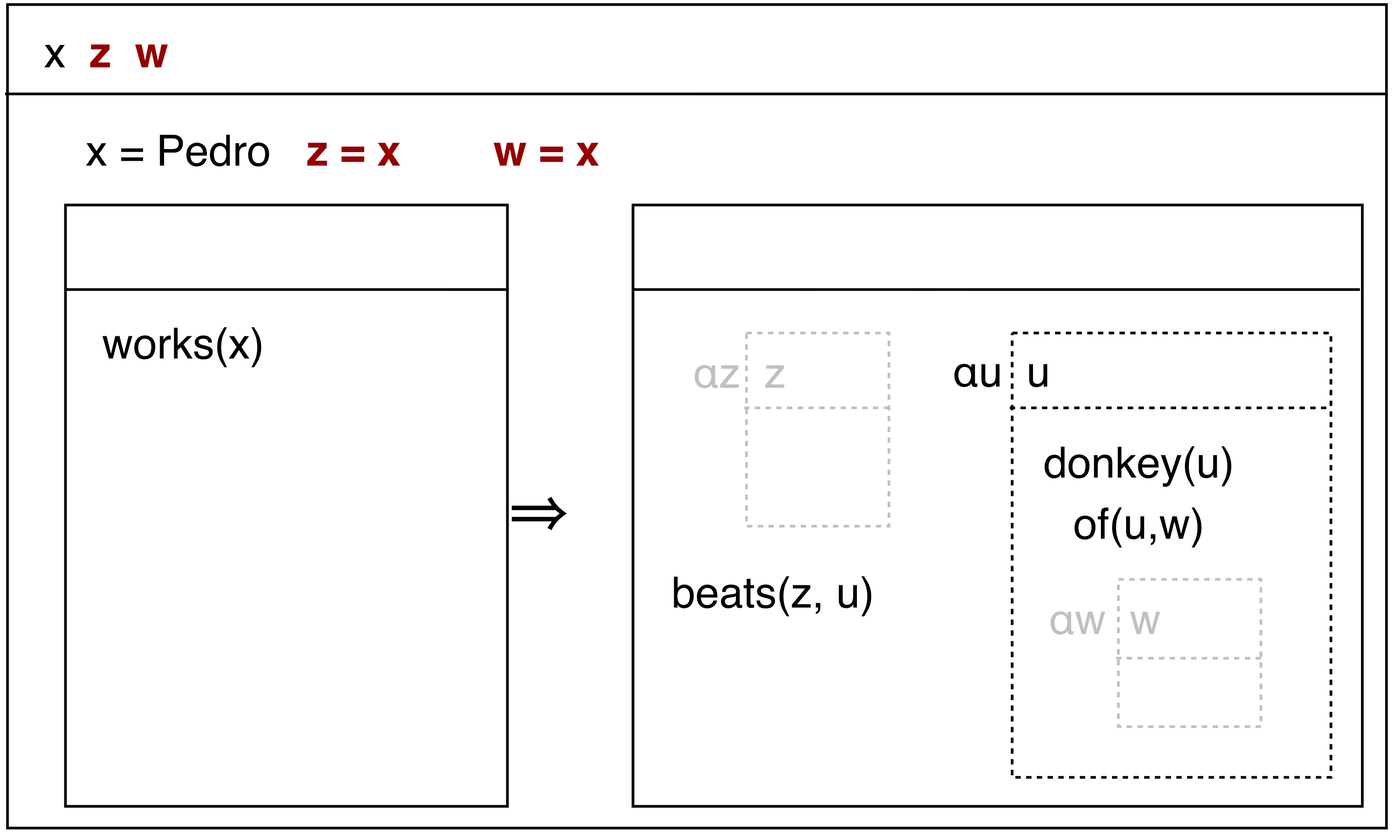
- *If Pedro works, he beats his donkey.*



Resolution by Accommodation

Example

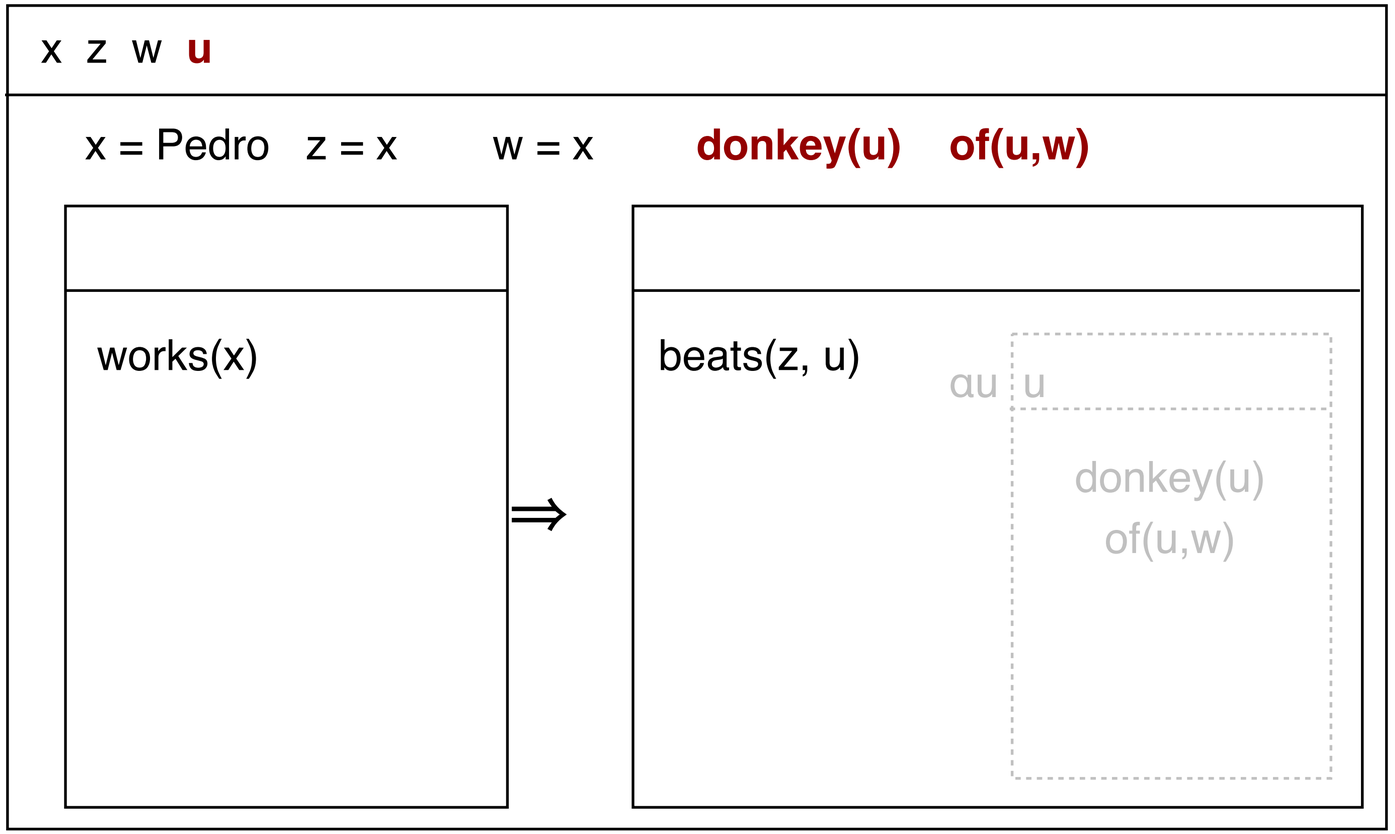
- *If Pedro works, he beats his donkey.*



Resolution by Accommodation

Example

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



Presupposition resolution in DRT

Preference principles

Presupposition resolution in DRT is guided by the following principles:

I. Binding is preferred over accommodation.

II. Binding works “upwards” along the accessibility relation: The “closest” possible antecedent is preferred.

III. Accommodation works “downwards” along the accessibility relation. It is preferred to accommodate into the highest possible DRS.

Presupposition resolution in DRT

Constraints on projection

Presupposition resolution in DRT must satisfy the following constraints:

Free variable constraint:

The resolved DRS may not contain any free discourse referents.

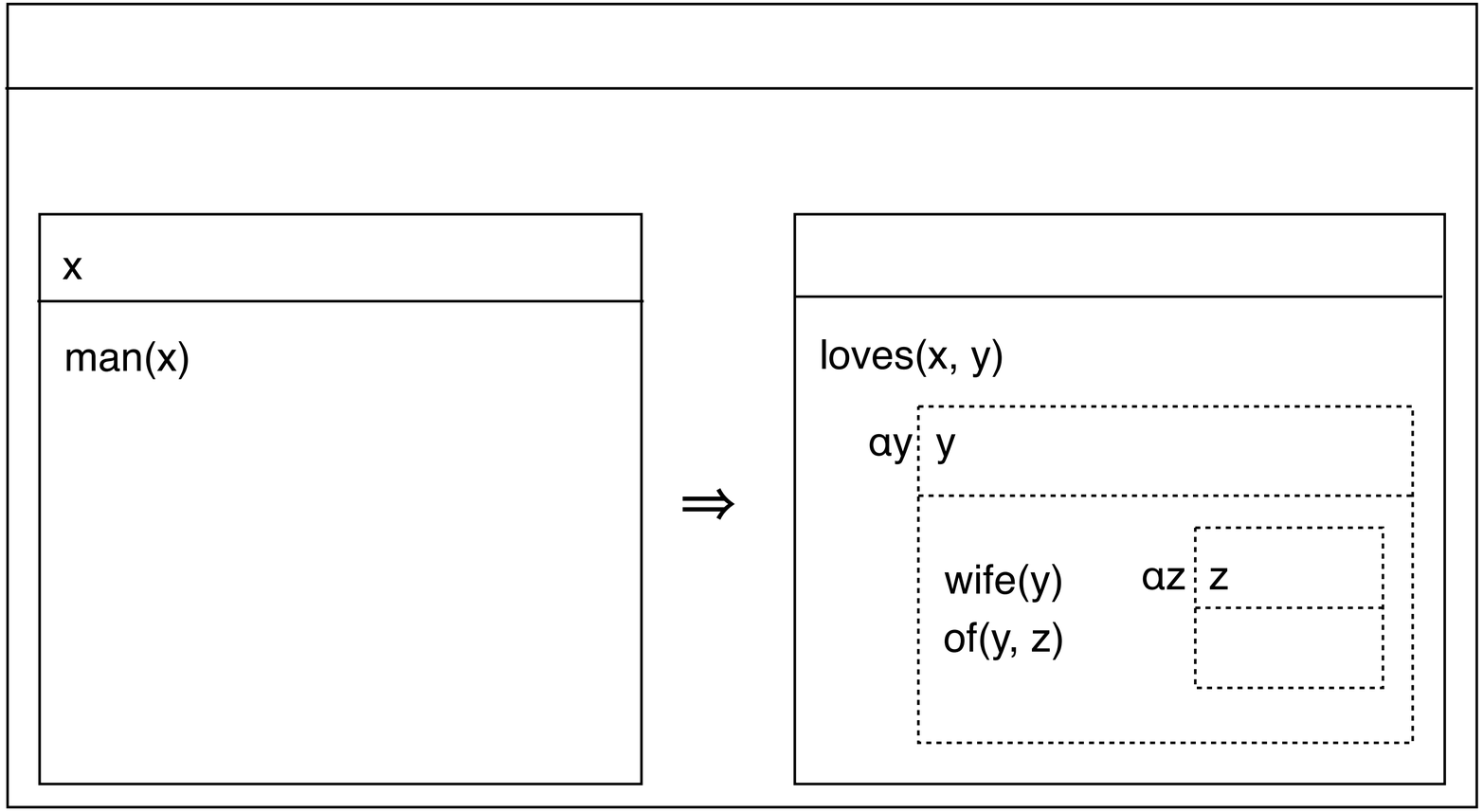
Consistency and informativity constraints:

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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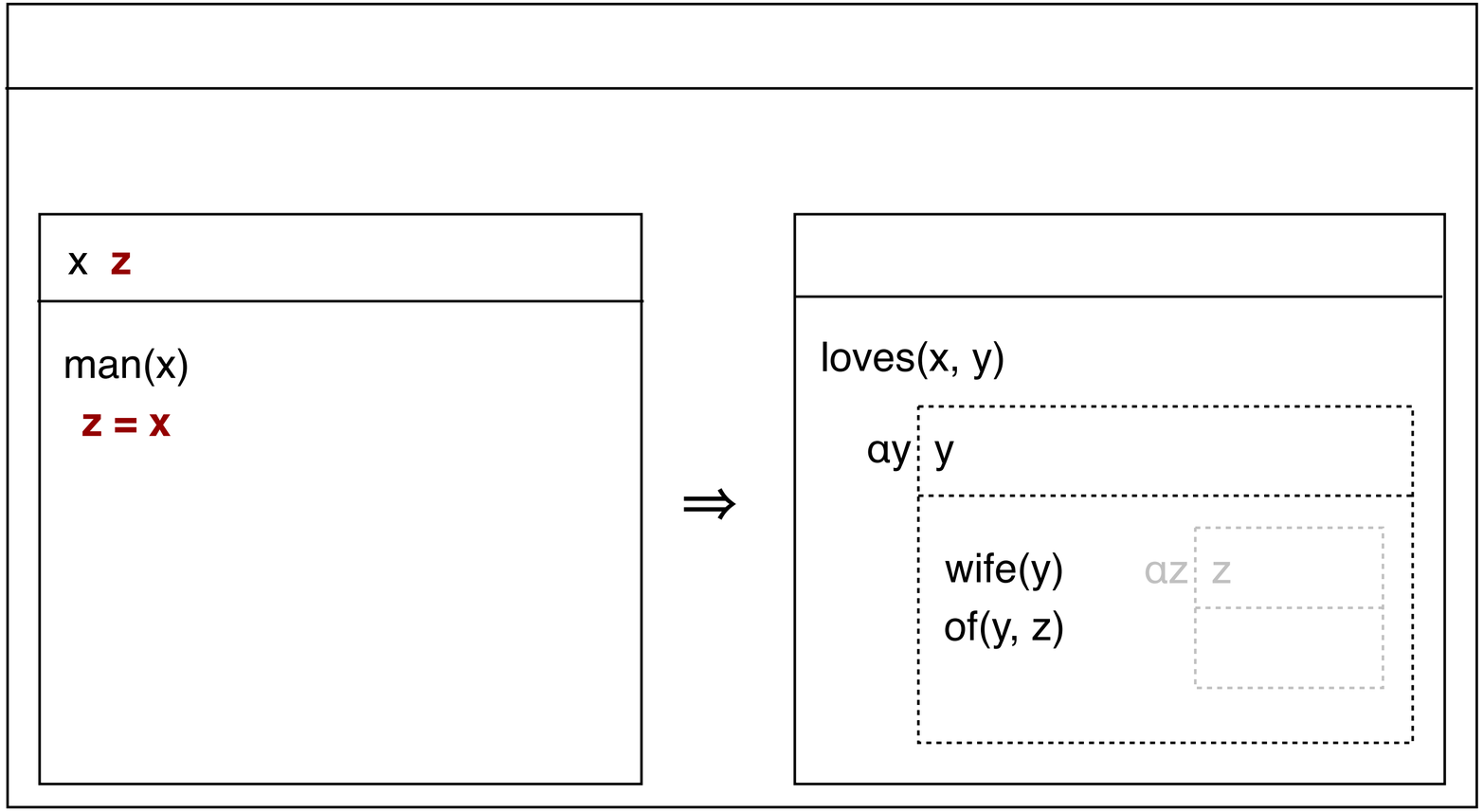

Free variable constraint

Example

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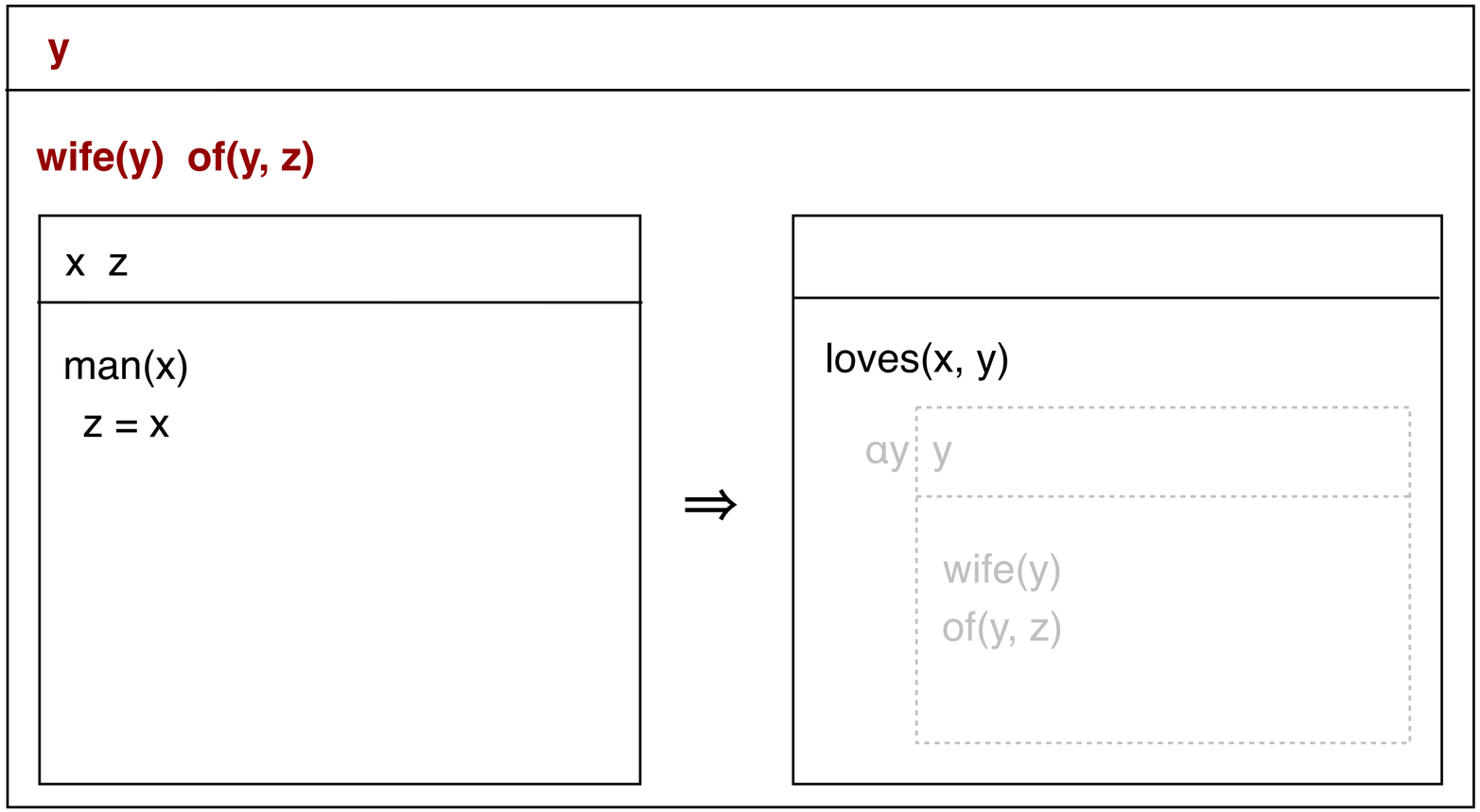
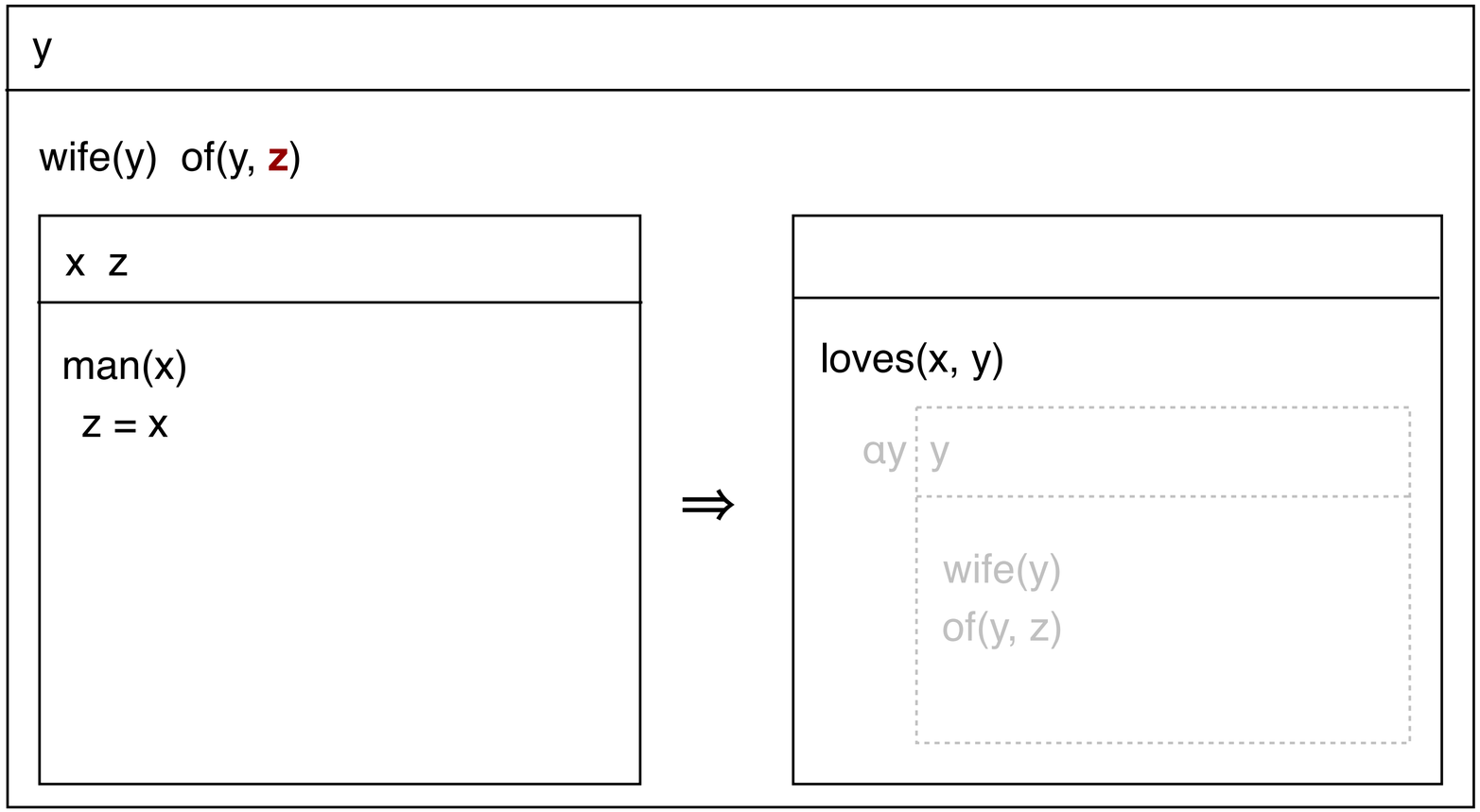


Free variable constraint

Example

- *Every man loves his wife.*

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

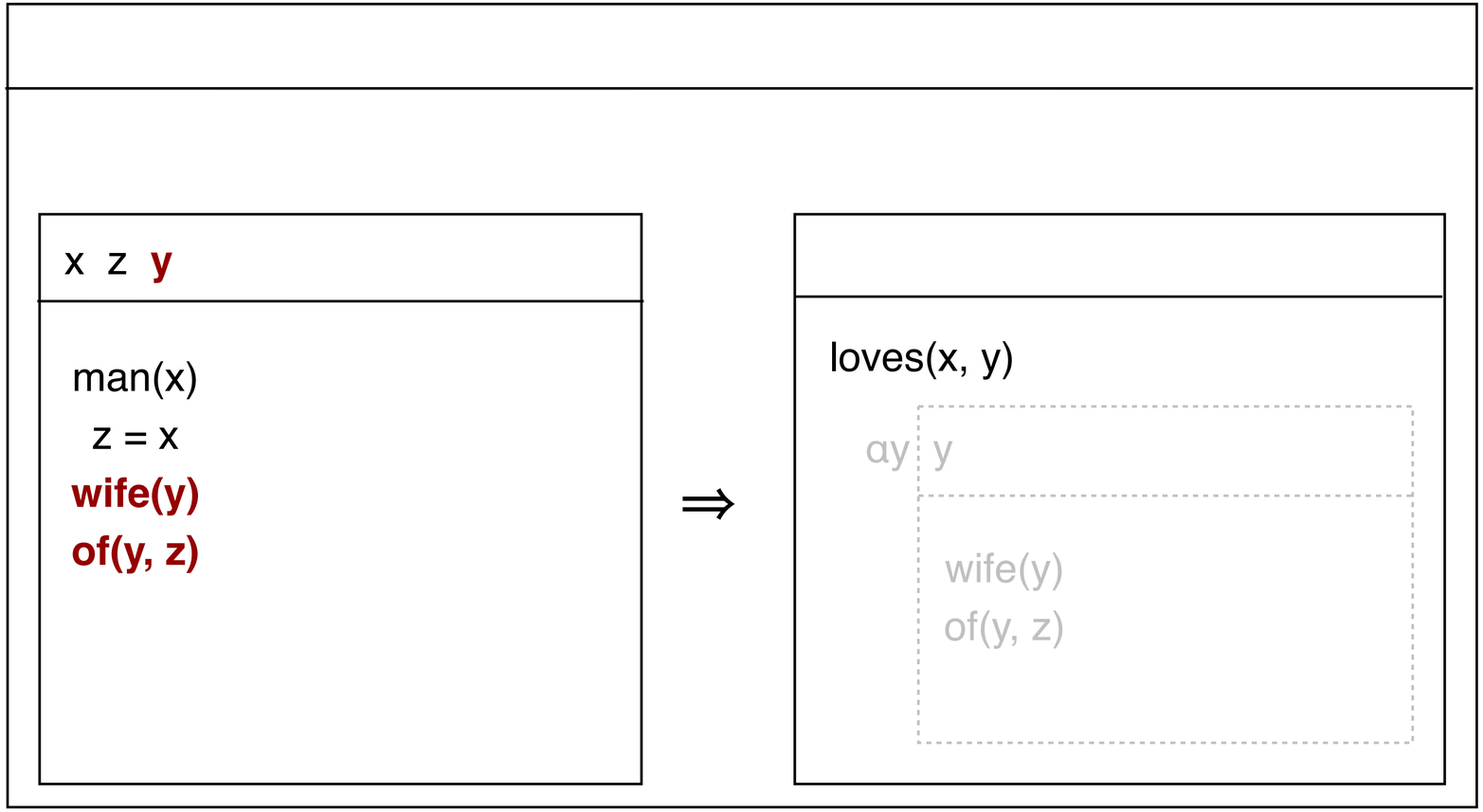


Free variable constraint

Example

- *Every man loves his wife.*

Admissible: (local) accommodation in the antecedent DRS.



Consistency and Informativity

Constraints on projection

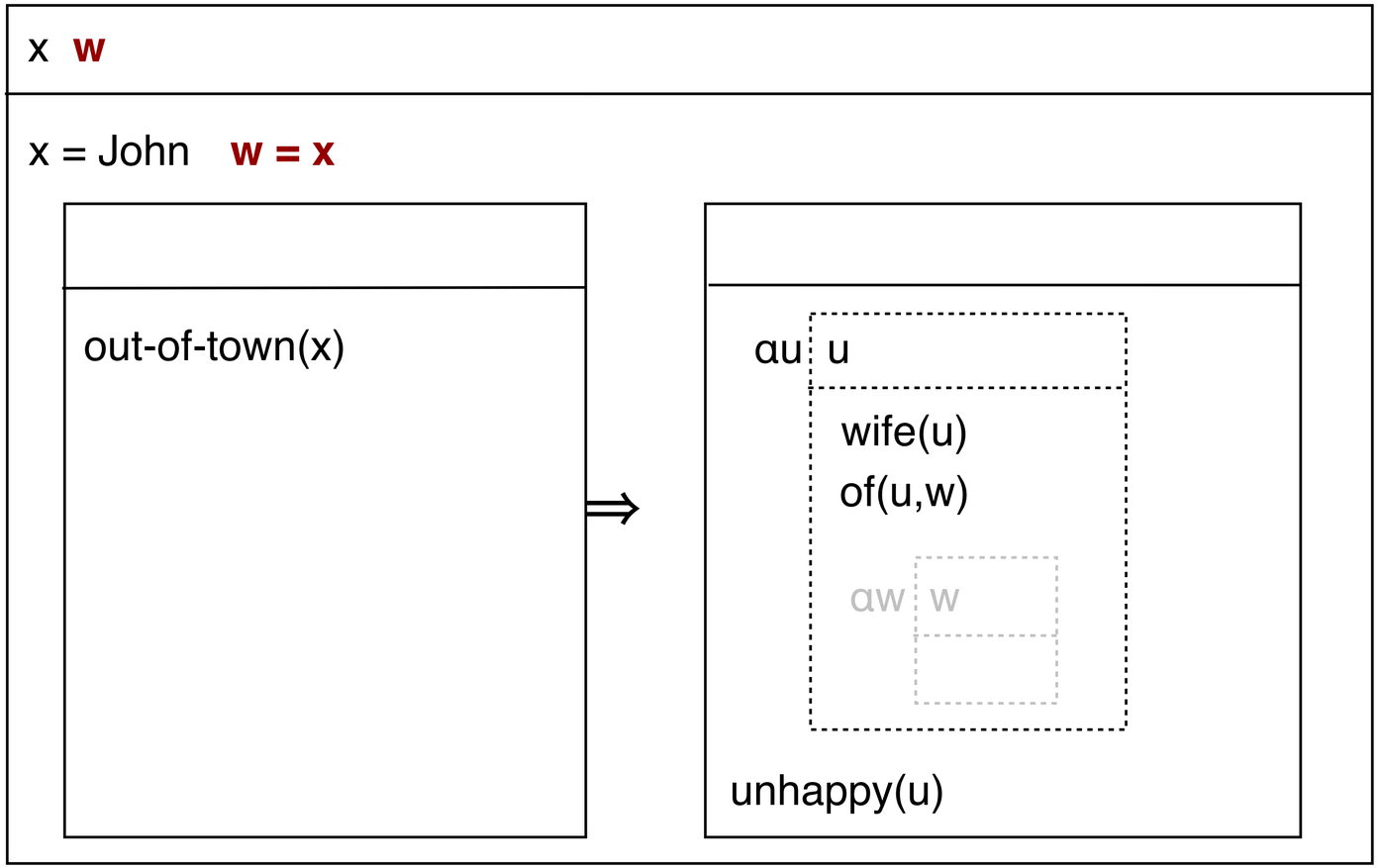
The resolved DRS must be consistent and informative.

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

(Local) Informativity

Example

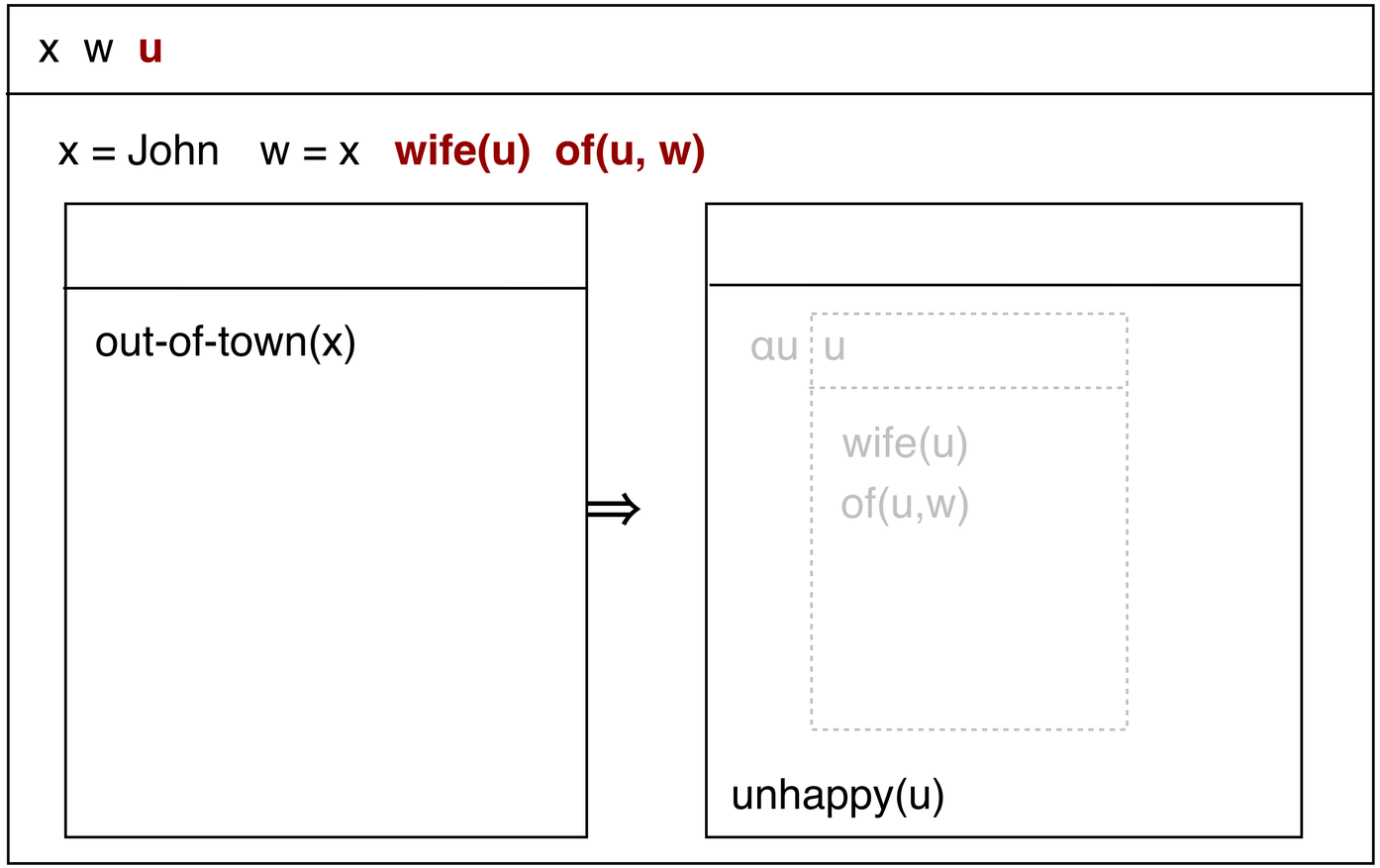
- *If John is out of town, his wife is unhappy.* » John has a wife



(Local) Informativity

Example

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



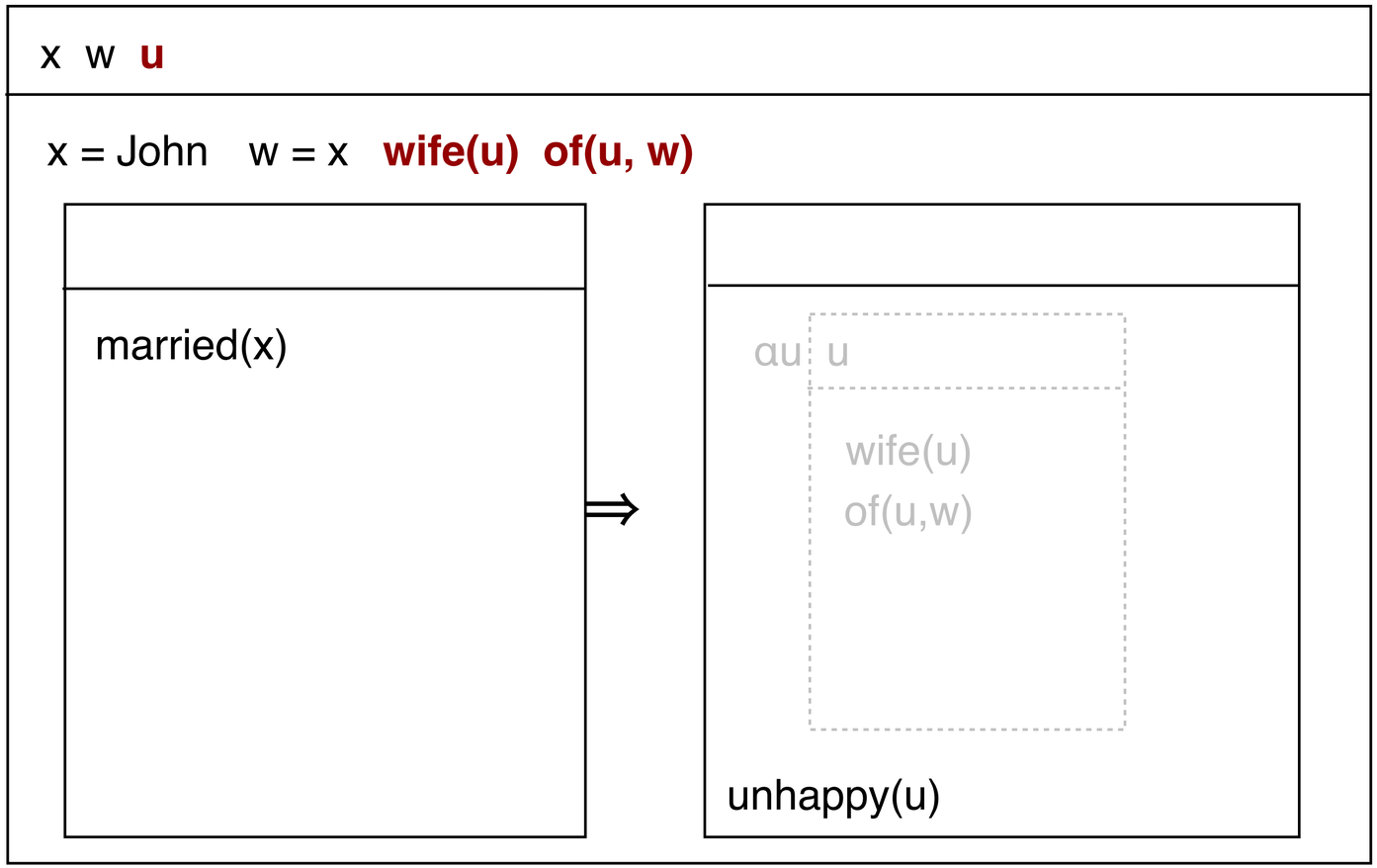
The resolved DRS entails that John has a wife.

(Local) Informativity

Example

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

↛ John has a wife

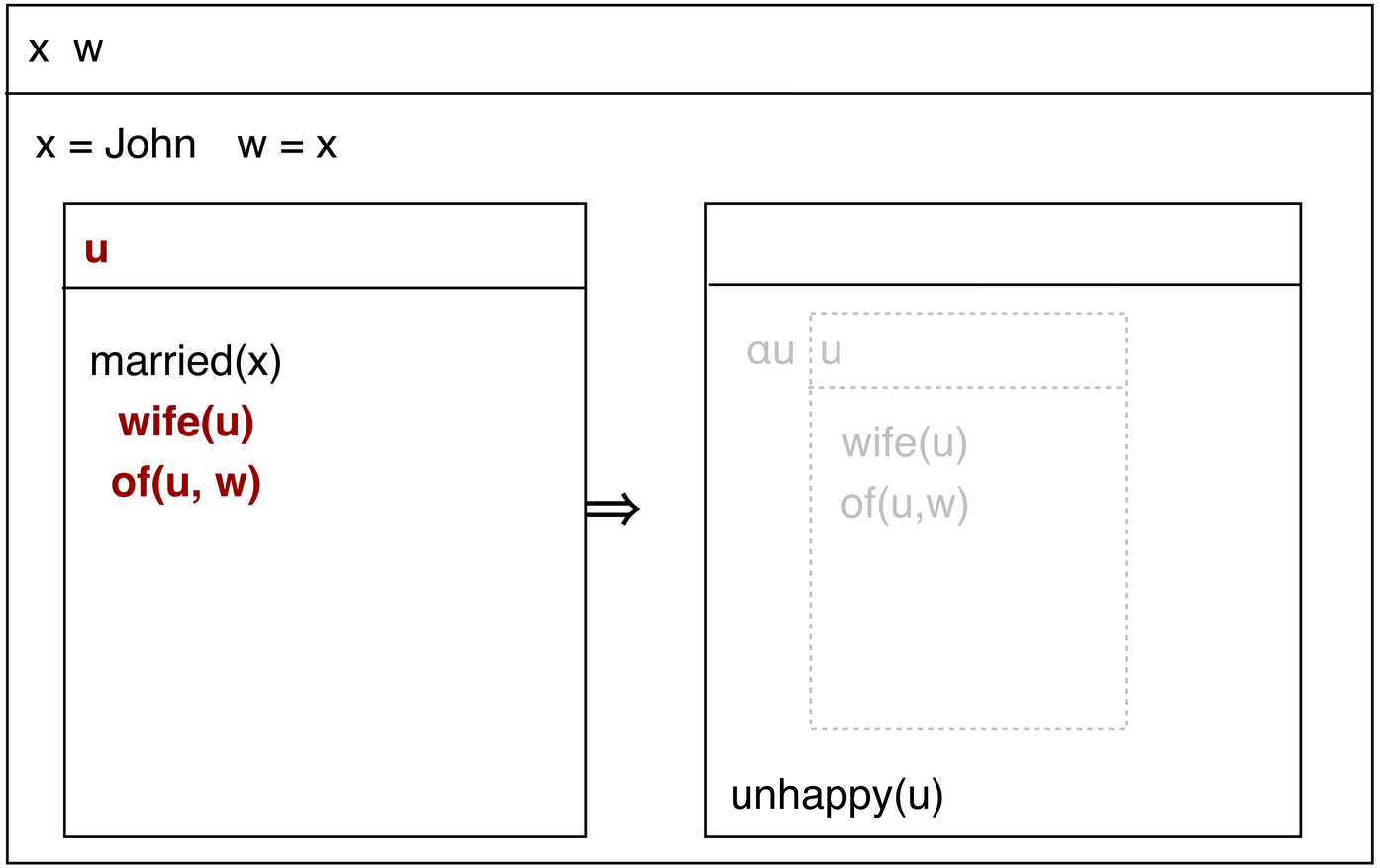


Inadmissible resolution:
Accommodation of “his wife” at the top level would enduce an entailment relation between the main DRS and the antecedent of the conditional, thus violating local informativity.

(Local) Informativity

Example

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



⇏ John has a wife

Admissible resolution:
Accommodation within the antecendent-DRS

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

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Article Contents

Abstract

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Acknowledgments

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B PDRT: Lexical semantics

Footnotes

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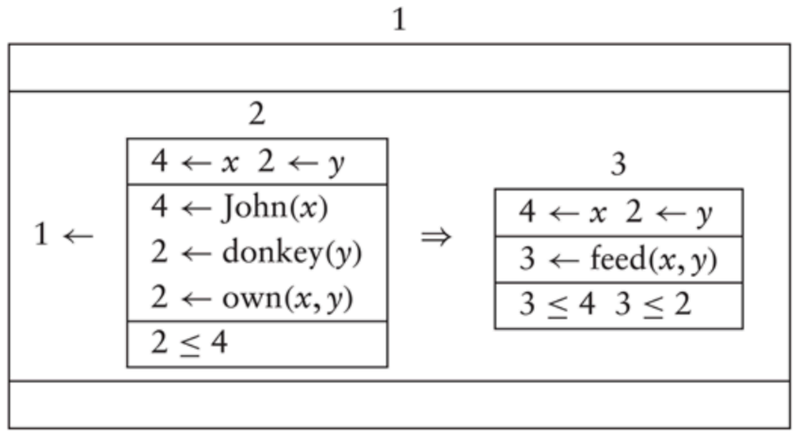
Discourse Semantics with Information Structure

Noortje J Venhuizen, Johan Bos, Petra Hendriks, Harm Brouwer

Journal of Semantics, Volume 35, Issue 1, February 2018, Pages 127–169,
https://doi.org/10.1093/jos/ffx017
Published: 16 January 2018 **Article history** ▾

(6) If John owns a donkey, he feeds it.



interpretation. By instantiating PDRT as a mature semantic formalism, we argue that it paves way for a more focused investigation of the information-structural aspects of meaning.

Issue Section: Article

1 Introduction

Any viable semantic theory should capture aspects of meaning beyond that of

Literature

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