

# **What Does It Mean To Be A Shelf?**

## **Semantic Bleaching and WORDNET**

Sandiway Fong  
NEC Research Institute  
Princeton NJ  
USA

`sandiway@research.nj.nec.com`

# Denominal Verbs: Box and Butter

*Remarks on Denominals* (Kiparsky, 1997):

John boxed the present

John PUT present IN <box>

John boxed the present in a gift box

#John boxed the present in a paper bag

# Denominal Verbs: Box and Butter

*Remarks on Denominals* (Kiparsky, 1997):

John boxed the present

John PUT present IN *<box>*      **Location**

John boxed the present in a gift box

#John boxed the present in a paper bag

John buttered the bread

John PUT *<butter>* ON bread      **Locatum**

John buttered the bread with margarine

#John buttered the bread with marmalade/onions

# Partial Bleaching

Peter shelved the books on the windowsill/  
mantelpiece/stand/table

#Peter shelved the books on the ball/spike/  
ceiling/floor/balcony

shelf → shelve  
N                      V

# Partial Bleaching

Peter shelved the books on the windowsill/  
mantelpiece/stand/table

#Peter shelved the books on the ball/spike/  
ceiling/floor/balcony

Sue breaded the fish with breadcrumbs/shred-  
ded coconut/crushed almonds

#Sue breaded the fish with marmalade/butter/trea-  
cle/ice

# Full Bleaching

Location verbs:

to **land** a hydroplane on **water**

to **dump** garbage by the **roadside**

to **ditch** a car in a **vacant lot**

to **warehouse** the empty crates in the **silo**

# Full Bleaching

Location verbs:

to **land** a hydroplane on water  
to **dump** garbage by the roadside  
to **ditch** a car in a vacant lot  
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Locatum verbs:

highways **blanketed** with fog  
burgers **blanketed** with onions  
streets **blanketed** with cars  
a steep embankment **blanketed** with dense foliage

# Full Bleaching

Locatum verb (**blanket**):

highways **blanketed** with fog  
burgers **blanketed** with onions  
streets **blanketed** with cars  
a steep embankment **blanketed** with dense foliage

Locatum verb (**blindfold**):

**blindfolded** with his own shirt/duct tape/a filthy rag/a  
teacosy

- Note: *blindfold*, *dump* are de-verbals (diachronically)...

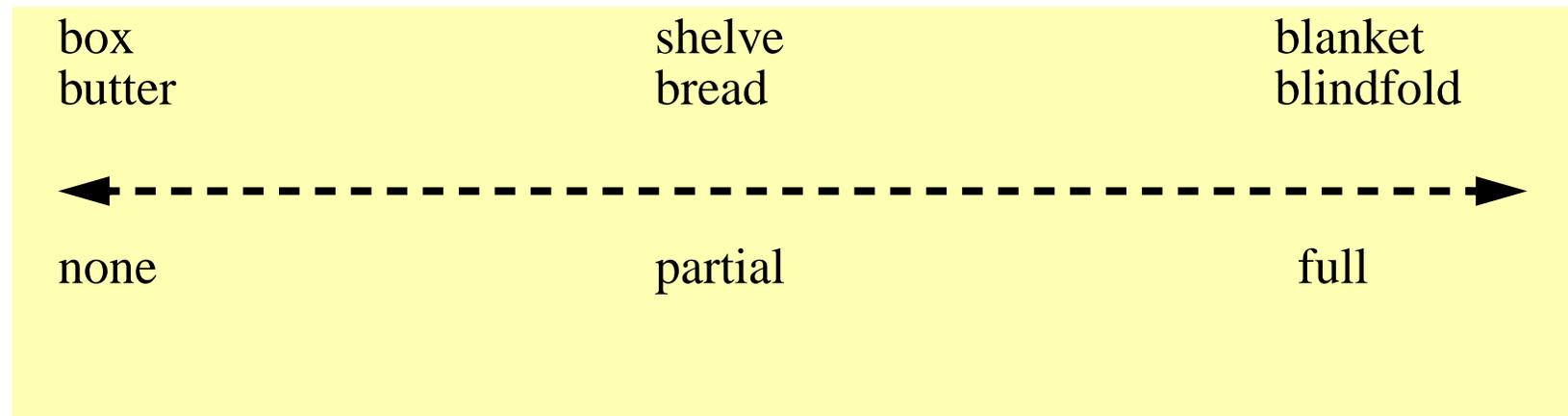
# Question

Can WordNet be used to predict and account for semantic bleaching?

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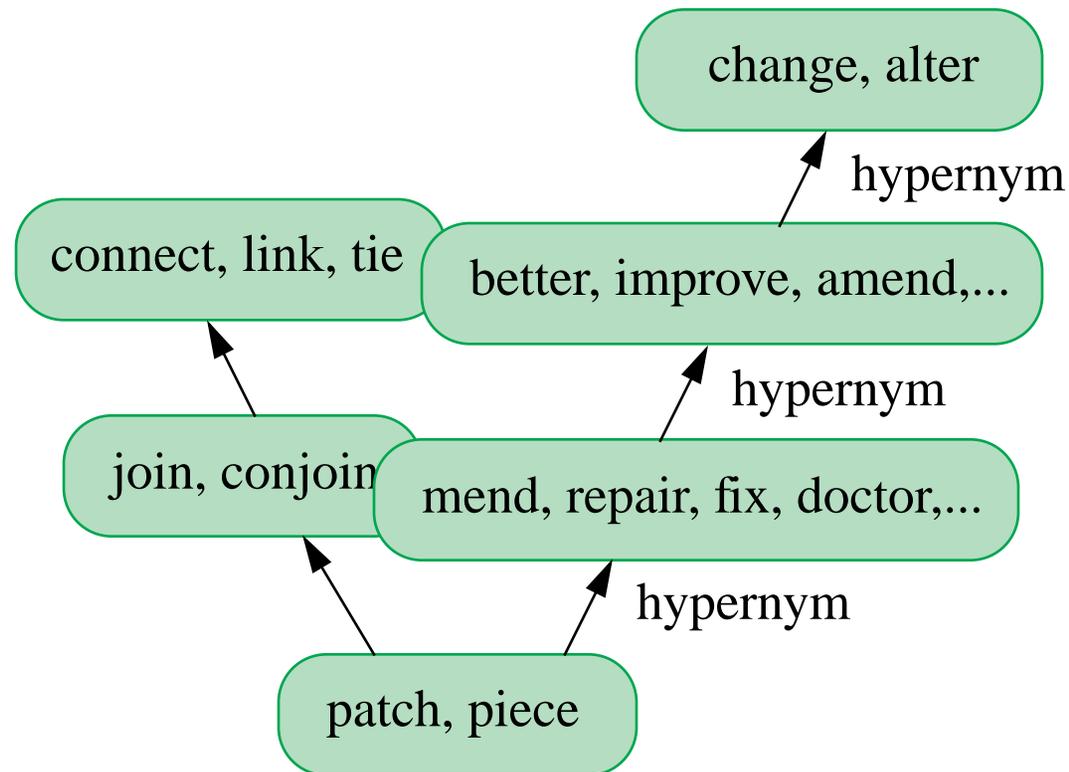
Can WordNet be used to predict and account for semantic bleaching?

Spectrum of bleaching:



# WORDNET

- Synonym set (synset) network for nouns, verbs, adjectives and adverbs
- Synsets connected by semantic relations (isa, antonymy, etc.)
- Size: 10K verbs (polysemy 2), 20K adjectives (polysemy 1.5)



# WORDNET Relations

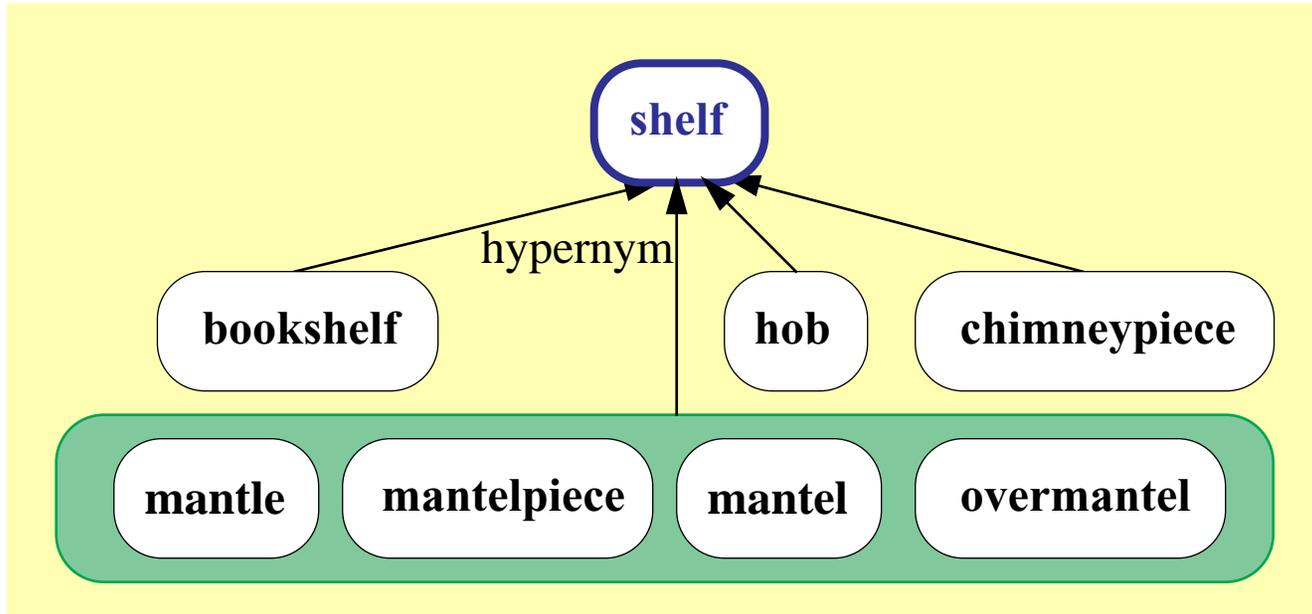
Relation	Description	Example
x HYP y	y is a hypernym of x	x: <i>repair</i> , y: <i>improve</i>
x ENT y	x entails y	x: <i>breathe</i> , y: <i>inhale</i>
x SIM y	y is similar to x (A)	x: <i>achromatic</i> , y: <i>white</i>
x CS y	y is a cause of x	x: <i>anesthetize</i> , y: <i>sleep</i>
x VGP y	y is similar to x (V)	x: <i>behave</i> , y: <i>pretend</i>
x ANT y	x and y are antonyms	x: <i>present</i> , y: <i>absent</i>
x SA y	x, see also y	x: <i>breathe</i> , y: <i>breathe out</i>
x PPL y	x participle of y	x: <i>applied</i> , y: <i>apply</i>
x PER y	x pertains to y	x: <i>abaxial</i> , y: <i>axial</i>

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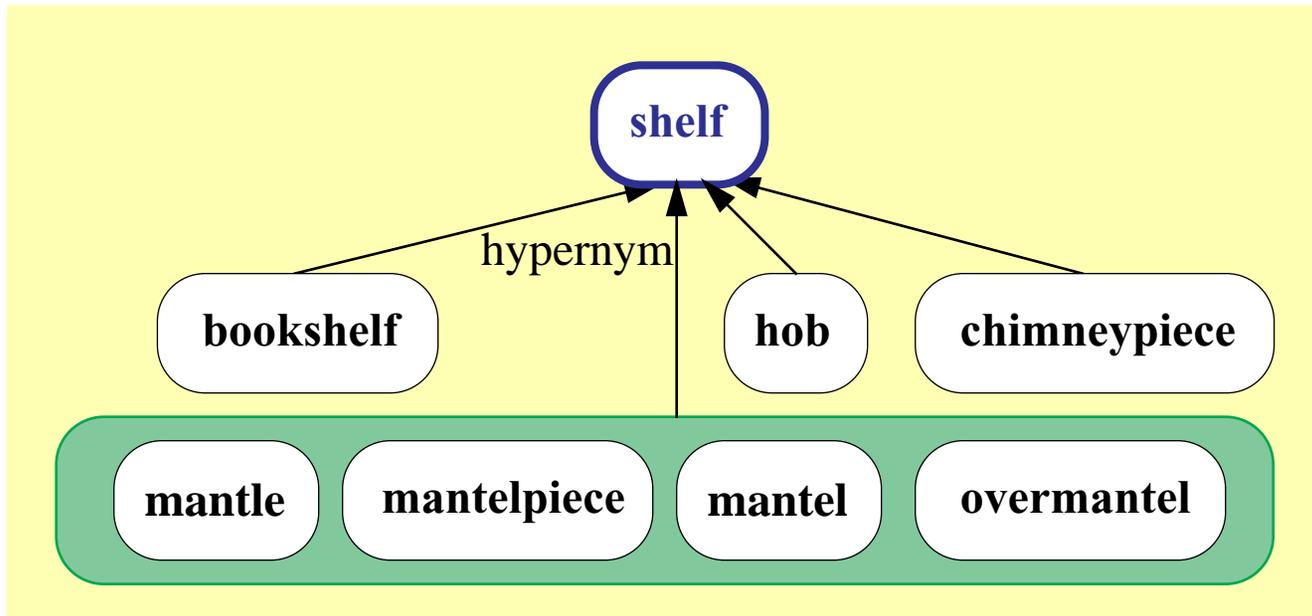
# Using WORDNET

- Concept of *shelf* as a horizontal support:



# Using WORDNET

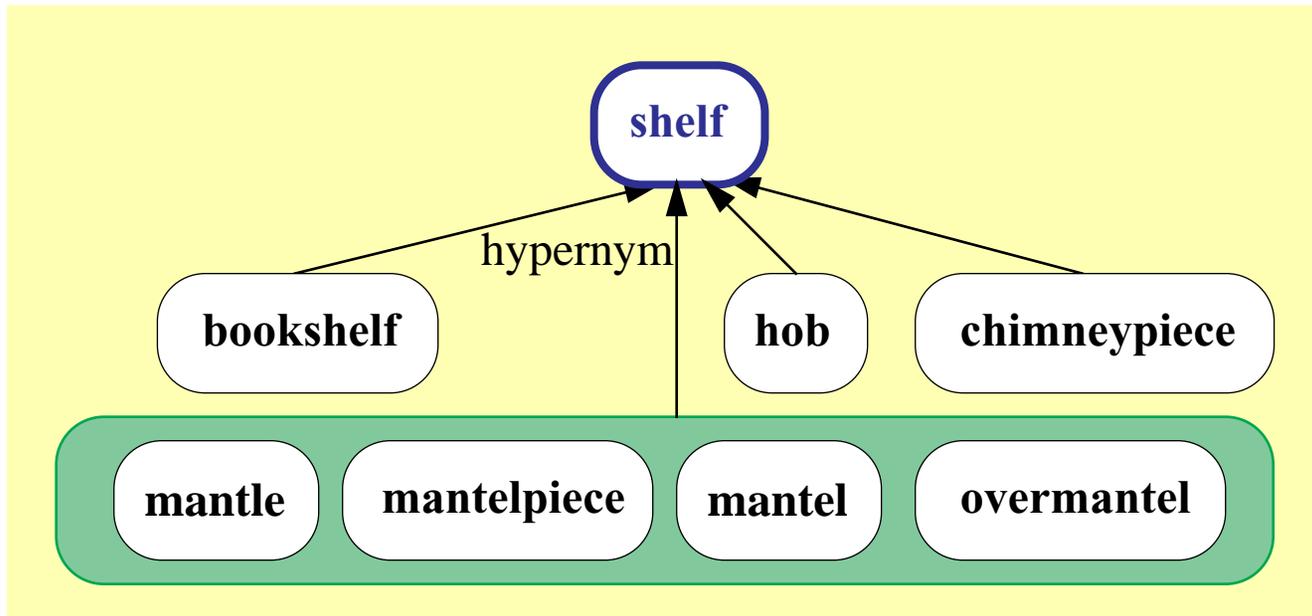
- Concept of *shelf* as a horizontal support:



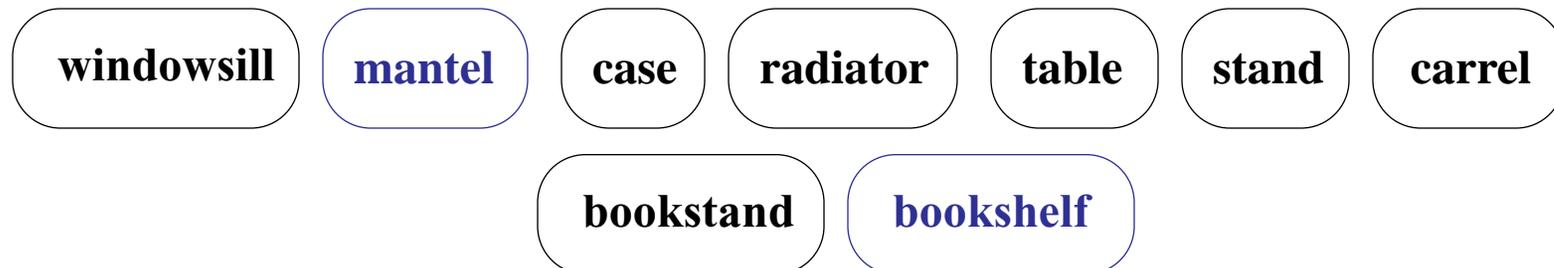
- Concept of *shelf* as a projecting ridge

# Using WORDNET

- Concept of *shelf* as a horizontal support:



- Web search (shelved +on <location>):



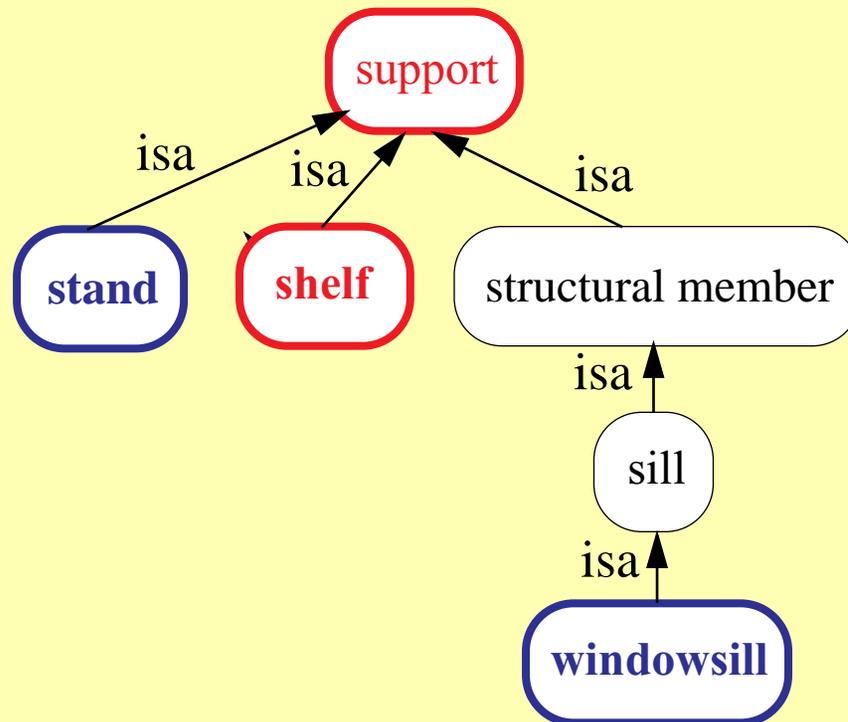
# Support and Shelf

<noun.artifact> **shelf**

-- (a support that consists of a horizontal surface for holding objects)

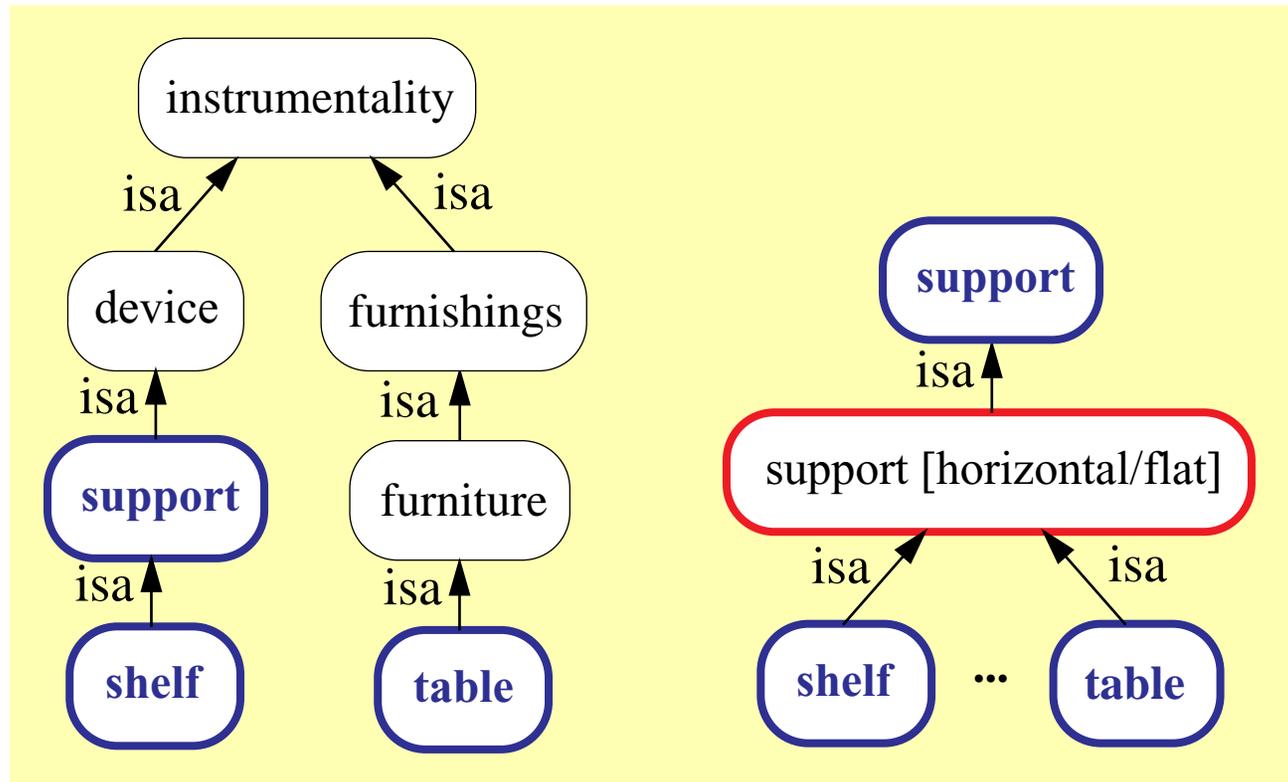
=> <noun.artifact> **support**

-- (any device that bears the weight of another thing)



# Table and Shelf

Cannot account for *table*:



- Notion of “functional” hypernymy

# Hyponyms of Support

andiron, firedog, dog, dogiron, arch support, back, backrest, backboard, baluster, base, pedestal, stand, bearing, bearing wall, bedpost, bookend, brace, bracket, bridge, foot, foothold, footing, handrest, hanger, harness, harp, headstock, leg, perch, pier, pillow block, rack, stand, rest, rib, rocker, seat, shelf, skieg, sling, spoke, radius, step, stair, stirrup, stirrup iron, stock, gunstock, structural member, tailstock, tee, football tee, undercarriage, yoke

# WordNet and Non-Bleaching Verbs

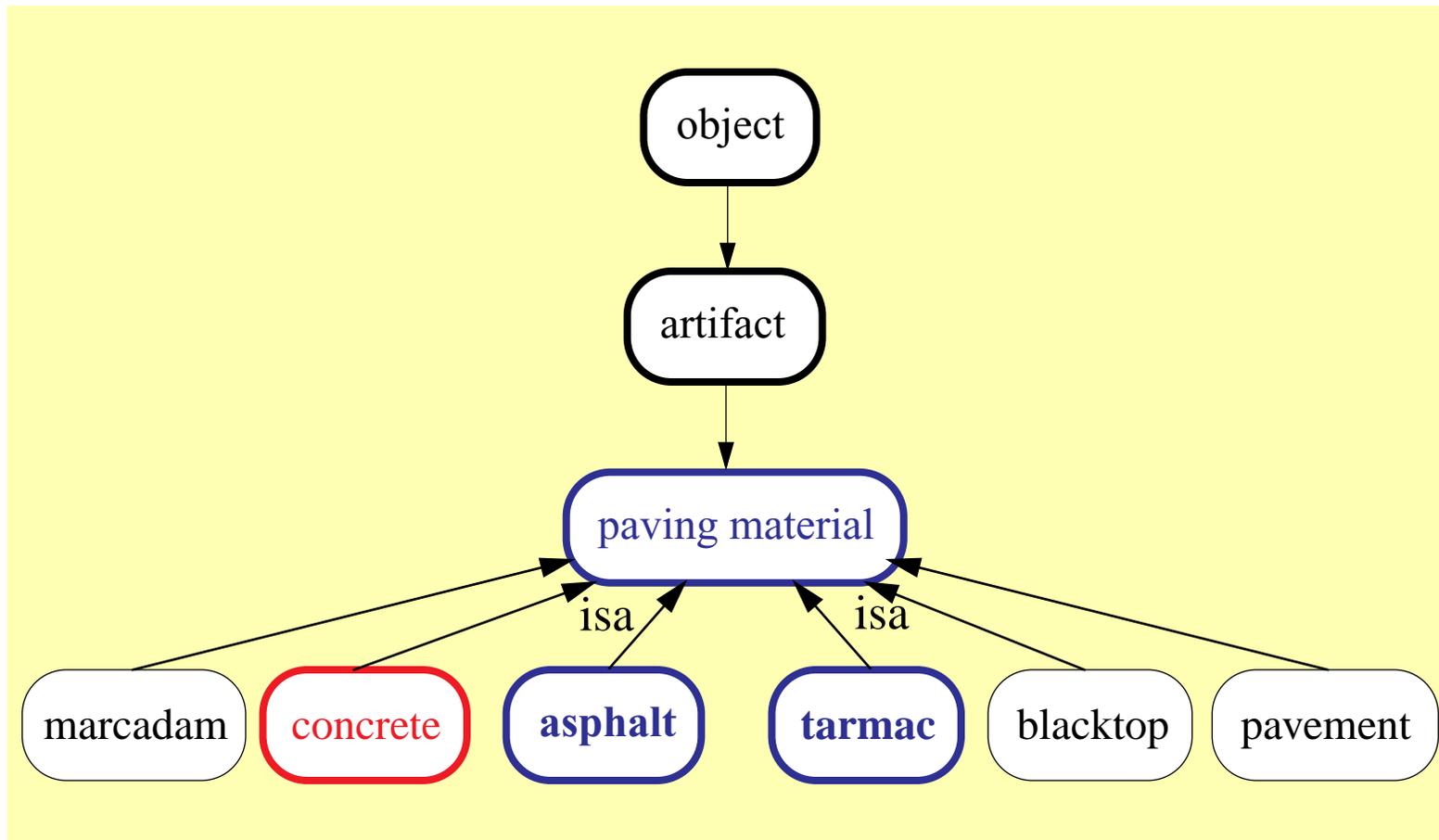
*Asphalt* and *tarmac*:

the crew asphalted/tarmaced the road with  
fresh asphalt/new tarmac

#the crew asphalted/tarmaced the road with  
concrete

#the crew asphalted/tarmaced the road with  
cobblestones

# Paving Materials



Hypothesis: Denominal leaf nodes are non-bleaching

# Bleaching and Leaf Concepts

- **Counterexamples:** *blanket* and *blindfold*

highways **blanketed** with fog

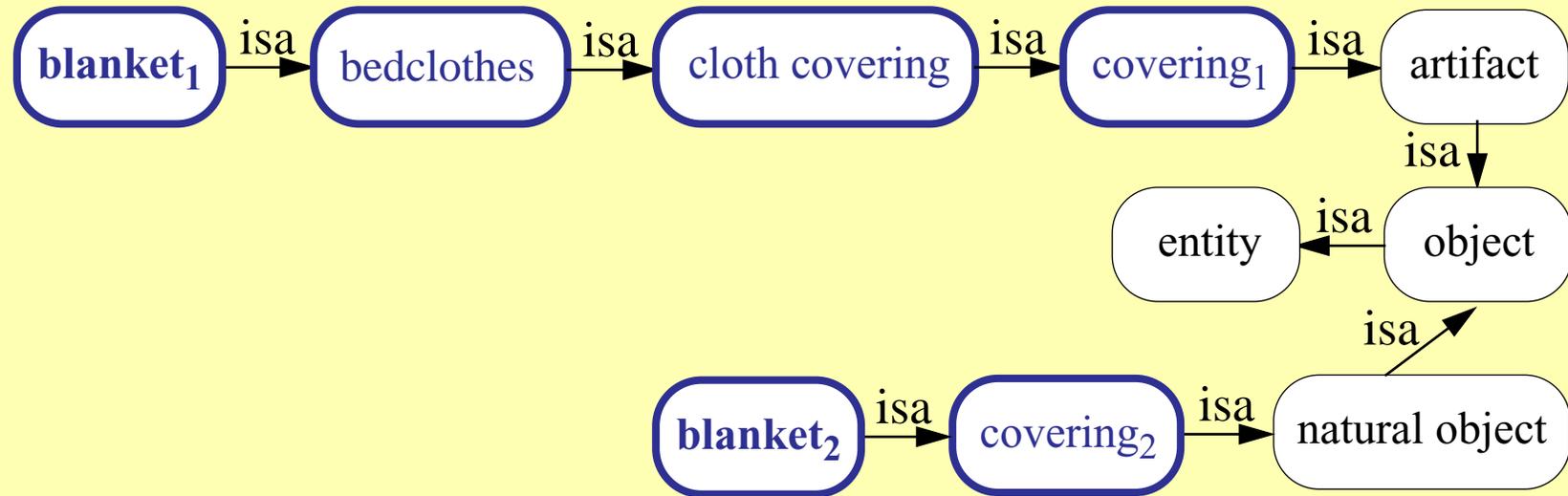
burgers **blanketed** with onions

streets **blanketed** with cars

a steep embankment **blanketed** with dense foliage

# Blanket

Functional superordinate: *covering*



# Coverings: Natural and Artificial

## Natural coverings:

scale, shell, test, body, covering sheath, case, integument, blanket, mantle, crust, incrustation, encrustation, envelope, shell, eggshell, slough, peridium, pericarp, seed vessel, perianth, floral envelope, theca, sac, indusium, bark

## Artificial coverings:

artificial skin, bootleg, canopy, casing, cloak, cloth, covering, clothing, clothes, apparel, vesture, wearing apparel, wear, coating, coat, cover plate, fig leaf, flap, floorcover, floor covering, folder, footwear, footgear, imbrication, overlapping, lapping, instep, mask, mercy seat, paddlebox, protective covering, protection screen, cover,covert, concealment, swathing top, upholstery, wrapping, wrap,wrapper

# Bleaching of Blanket

## Web Data:

snow, fog, parachutes, sauce, smog, debris, ash, flowers, glaze, wildflowers, bacon, forest, garland, mixed grill, turkey, ham, smoke, compost, clippings, mulch, cheese, onions, plants, fallout, panels, bodies, pines, mixture, foliage, tephra, blast material, craters, salsa, yogurt, shards, paper, scrub, cars, till, wilderness, loess, crabmeat, fondue, logos, landmines, deposits, Teflon, bags, turf, notices, bracken, heather, moss, mud, fronds, trees, groves, posters, handbills, doorknobs, powder, haze, sand, absorbent, leaves, stars, crickets, peanuts, plaques, foul air, particles, ice, rainforest, spruce, cedar, coating

# Bleaching of Blanket

Exclude metaphorical uses:

The countryside is blanketed in *snow*, but it is  
also blanketed with *concern* [BBC NEWS]

Event semantics:

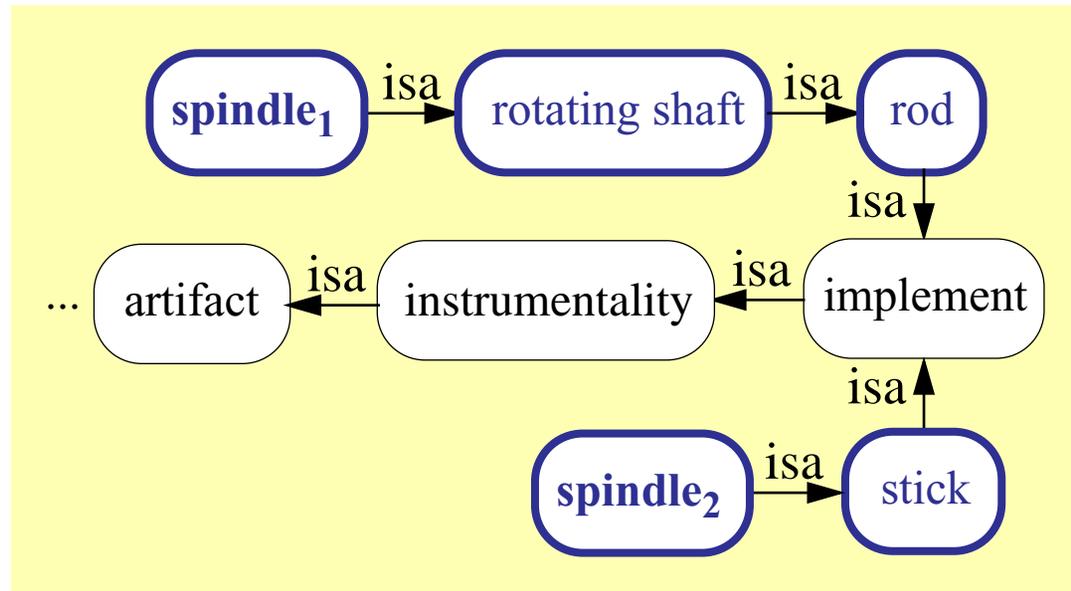
X PUT <*blanket*> ON/OVER y  
X PUT <*covering*> ON/OVER y

Same goes for *blindfold*...

# Spindle and Spear

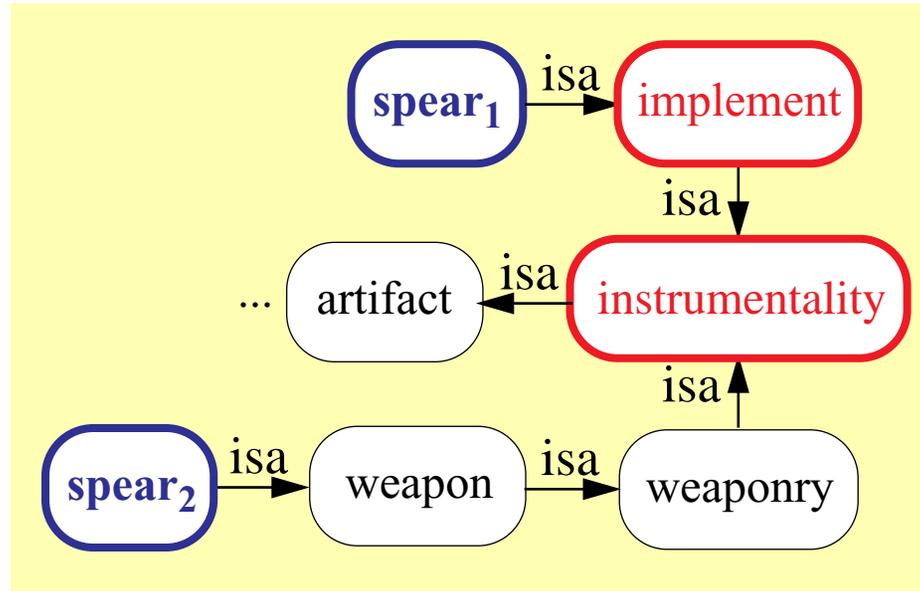
the dragon has been spindled on a spear  
x PUT y on <spindle>

WordNet hierarchy:



# Components of a Spear

WordNet hierarchy:



- Two senses for *spear*:
  1. an implement with a *shaft* and a barbed point used for catching fish
  2. a long pointed *rod* used as weapon
- Notion of Indirect Functionality: *sharpened shaft* or *rod*

# Summary

Linguistic Phenomenon of *Semantic Bleaching*:

- Location/Locatum denominals
- ...or morphologically and semantically related noun/verb pairs

Application of WordNet's hyponym-hypernym network

- Functional hypernymy...

Evaluation of the hyponym-hypernym network

- Possible changes... (table/shelf)
- Language specificity?