Nonrestrictive adjectives and the theory of scalar implicature

Timothy Leffel (tim.leffel@nyu.edu) // New York University and Universität Potsdam/SFB 632 // GLOW 35

1. Blind implicatures

Certain implicatures appear to be computed even when world knowledge should be sufficient to block them (Magri (2009,2011); Singh (2009)).

(1) a. #Some Italians come from a warm country.
b. ⇝Not all Italians come from a warm country.

(2) *Context:* Prof. Smith assigned the same grade to all of his students.
a. #Smith assigned an A to some of his students.
b. ⇝Smith did not assign an A to all of his students.

Blindness Hypothesis (Magri): Implicatures are computed without access to contextual information.

2. Asymmetry in DE contexts

Katzir (2007): Modified nouns trigger implicatures in downward-entailing contexts.

(3) a. Every blond student passed.
b. Every student with blond hair passed.
c. Every student who is blond passed.
d. ⇝Not every student passed.

(4) shows that these implicatures are also computed blindly: world knowledge does not block implicature calculation, and # results.

(4) a. #Every carcinogen that is harmful will be eliminated by this product.
b. ⇝ Not every carcinogen will be eliminated by this product.

The problem: nouns modified by nonrestrictive adjectives do not give rise to corresponding implicatures—(5)↛(4b), hence no #.

(5) Every harmful carcinogen will be eliminated by this product.

Goal: to explain the asymmetry between nonrestrictive adjectives and other kinds of nominal modifiers.

> **Main Claim:** the contrast between (4a) and (5) is due to an interaction between the syntax/semantics of NR modification and general principles of implicature calculation.

3. Summary of analysis

1. NAs introduce the presupposition that the elements in the extension of the noun have the property denoted by the adjective.
2. Structural alternatives (Katzir 2007) + Blindness Hypothesis (Magri 2009) + **1.** ⇒

- Sentences like (5) are not asymmetrically entailed by their modifierless alternatives, and so do not trigger implicatures.
- Sentences like (4a) are asymmetrically entailed by their modifierless alternatives, and therefore trigger implicatures.

4. NAs as presuppositional

NAs license a generic/universal inference regardless of the semantics of the determiner.

(6) a. Cigarettes contain several/few/many/most/a lot of/no harmful carcinogens.
b. ∴Carcinogens are harmful.

Presupposition-like projection ((7)); patterns unlike appositives w.r.t. information status ((8-9), cf. "CI"-based accounts of NR modification such as Morzycki 2008; Solt 2009)

(7) a. There's no way every harmful carcinogen will be eliminated—lots of carcinogens will remain.
b. Can this rid my body of every harmful carcinogen?

(8) (CI vs. ps. diagnostic from Potts 2005)
a. John is tall and I know John is tall.
b. #John is tall and John, who is tall,...

(9) a. Flowers are beautiful, and I would like some beautiful flowers.
b. #Flowers are beautiful, and I would like some flowers, which are beautiful.

(6-9) suggest that the universal/generic inference licensed by NAs is a presupposition.

The distribution of NR readings mirrors that of other "direct modification" adjectives (Larson (1998,2000); Larson & Marušič (2004); Cinque (2010))

(10) a. Every unsuitable word was deleted.
unsuitable: ✓Restr. ✓NR
b. Every word unsuitable was deleted.
unsuitable: ✓Restr. ✗NR

(11) a. The visible stars include Sirius.
visible: ✓s-level ✓i-level
b. The stars visible include Sirius.
visible: ✓s-level ✗i-level

Direct modifiers receive their interpretations from functional heads (following Cinque (2010)). The nonrestrictive head introduces a generic presupposition (see handout more for details/motivation).

(12) a. Semantics for NR head:
$\text{GEN}_{\text{NR}} : \lambda P \lambda Q \lambda y : \Gamma x[P(x)][Q(x)].P(y)$
b. $\lambda y : \Gamma x[carcinogen'(x)][harmful'(x)].carcinogen'(y)$
"The set of y such that y is a carcinogen (defined iff carcinogens are generically harmful)"

> On this theory, (5) has a presupposition that (4a) lacks. Therefore (13) is logically stronger than (4a) but not (5). **This explains the contrast between (4a) and (5)**

(13) Every carcinogen will be eliminated by this product.

Formalization requires two principles of implicature calculation...

5. Implicature calculation

Structural alternatives (Katzir 2007) are required to guarantee that, e.g. (13) is an alternative to (4a) but not vice versa.

(14) ψ is an alternative to φ ($\psi \in Alt(\varphi)$) iff ψ can be obtained from φ by a series of deletions, contractions, and substitutions of terminal elements.

(15) φ is strictly better than ψ ($\varphi \prec \psi$) iff
a. $\varphi \in Alt(\psi)$ and φ **entails** ψ; and either
b. $\psi \notin Alt(\varphi)$ or ψ does not entail φ

(16) An utterance of φ implicates that for all $\psi \in Alt(\varphi)$ s.t. $\psi \prec \varphi$, ψ is unassertable, false, or irrelevant (depending on context).

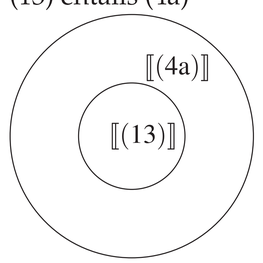
Blindness Hypothesis (Magri 2009) is required to guarantee the patterns observed in, e.g. (1-2), (4):
The definition of "entailment" for computing implicatures is **logical entailment** (=(17a)), not **contextual entailment** (=(17b)).

(17) a. φ *logically* entails ψ iff $[\![\varphi]\!] \subseteq [\![\psi]\!]$
b. φ *contextually* entails ψ iff $([\![\varphi]\!] \cap C) \subseteq [\![\psi]\!]$, where C is the Context Set.

6. Explaining the Restr./NR contrast

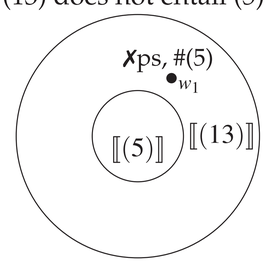
There are **logically** possible worlds (inconsistent with common knowledge) where carcinogens are not generally harmful, so there will be worlds such as w_1 below where the presupposition of (5) (="ps") is not satisfied; and hence where (5) is neither true nor false.

(13) entails (4a)



$(13) \in Alt((4a))$ and $(4a) \notin Alt((13))$
$\therefore (13) \prec (4a)$
$\therefore$ expected implicature from (4a)

(13) does not entail (5)



$\therefore (13) \not\prec (5)$
$\therefore$ no implicature from (5)

7. Conclusions

1. The grammatical/presuppositional approach to NAs has syntactic and semantic motivation.
2. A difference in observed implicatures has been attributed to a difference in presupposition. Possible implications for Singh's (2009) reduction of *Maximize Presupposition!* to the theory of SI.

References and acknowledgments on handout