Negotiating lexical uncertainty and expertise with disjunction

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Communicating in language about language

- Languages are neither fixed across time nor identically reproduced in all speakers, but rather continually renegotiated during interactions [7].
- People accommodate to each other's usage patterns [16], form temporarily lexical pacts [8, 3], and instruct each other about their linguistic views [18, 39].
- Some of this communication in language about language is direct, as with explicit definitions, but much of it arrives via secondary pragmatic inferences.
- Disjunction supports what appear to be opposing inferences about language:
  - **Hurfordian pressure [21]:** *X or Y* conveys that *X* and *Y* are disjoint
  - **Definitional inference [20]:** *X or Y* conveys that *X* and *Y* are synonymous
- This pattern is cross-linguistically robust, so we seek a single pragmatic model that can derive both of these meanings from the semantics of disjunction given different contextual assumptions.

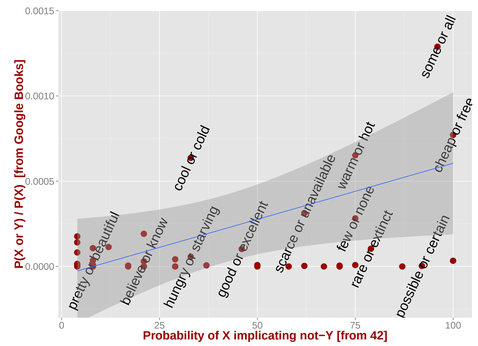
Hurfordian perceptions and intentions

Generalization: *X or Y* conveys that the speaker is using a lexicon in which *X* and *Y* are disjoint, or it addresses a speaker concern that the listener is using such a lexicon.

(1) the nuptials will take place in either France or Paris
(2) the canoe or boat will be held by the stream's current
(3) In 1940, 37% of us had gone to a church or synagogue in the last week.

No clear evidence for ordering restrictions or preferences deriving from the entailment relation:

Our corpus	
Disjunct order	Exs.
[general] or [specific]	79
[specific] or [general]	90



The frequency of *X or Y* correlates with the prevalence of *X* implicating *not Y* [5].

Disjunctive definition and identification

Generalization: *X or Y* can convey $[\![X]\!] \approx [\![Y]\!]$ when the speaker is mutually, publicly known to be an expert or would like to establish expertise.

(4) She's a wine lover or *oenophile*.
(5) Title: A Geological History of Manhattan or New York Island
(6) Welcome to New Haven or "the Elm City".
(7) It's a woodchuck, or land beaver.

- Motivation: speaker is a known 'instructor'; listener is a known non-expert.
- Motivation: speaker wishes to display expertise to another expert.
- Motivation: speaker sees value in (temporarily or permanently) defining a term.

Attested in Chinese, German, Hebrew, Ilokano, Japanese, Russian, and Tagalog. Seems to survive even where the language has a dedicated definitional disjunction morpheme (e.g., Finnish, Italian).

Further information

Paper, references, model code, corpus data: `http://github.com/cgpotts/pypragmods/`

Modeling communication with anxious experts

$$\cdots$$

$$S_2(m \mid w, \mathcal{L}) \propto \exp\left(\log\left(\alpha\, L_1(w \mid m, \mathcal{L})\right) - \beta \log\left(L_1(\mathcal{L} \mid m)\right) - C(m)\right)$$

world information − lexical preferences − costs

← Rich secondary meanings about language

$$L_1(w, \mathcal{L} \mid m) = l_1(w \mid m, \mathcal{L}) L_1(\mathcal{L} \mid m)$$

world information ∗ lexical discrimination

← suffices for manner implicature and embedded scalar implicature [38, 2]

$$l_1(w \mid m, \mathcal{L}) \propto s_1(m \mid w, \mathcal{L}) P(w)$$

← suffices for unembedded scalar implicature [12]

$$s_1(m \mid w, \mathcal{L}) \propto \exp\left(\log\left(\alpha\, l_0(w \mid m, \mathcal{L})\right) - C(m)\right)$$

← suffices for many kinds of ambiguity avoidance

$$l_0(w \mid m, \mathcal{L}) \propto \frac{\mathbb{I}(w \in \mathcal{L}(m))}{|\mathcal{L}(m)|} P(w)$$

← literal listener; interpretive semantics with priors

Definitional contexts

Require low disjunction costs and high β: the speaker is invested in communicating about the lexicon and can tolerate the cost of a disjunction that is synonymous with one of its disjuncts.

L_2 hears *A or X*	w_1	w_2	$w_1 \vee w_2$
$\mathcal{L}^*[A{:}\{w_1\}, B{:}\{w_2\}, X{:}\{w_1, w_2\}]$	0	0	.08
$\mathcal{L}_1[A{:}\{w_1\}, B{:}\{w_2\}, X{:}\{w_2\}]$	.01	0	.08
$\mathcal{L}_2[A{:}\{\mathbf{w_1}\}, B{:}\{w_2\}, X{:}\{\mathbf{w_1}\}]$	.77	0	.06

$\alpha = 5$; $\beta = 7$; $C(or) = .01$

S_2 observes $\langle \mathcal{L}_2, w_1 \rangle$ ↓

A	*X*	*A or X*
.07	.48	.45

(bias against A *or* X is gone by S_3)

↓

L_1 hears *A or X*	w_1	w_2	$w_1 \vee w_2$
$\mathcal{L}^*[A{:}\{w_1\}, B{:}\{w_2\}, X{:}\{w_1, w_2\}]$	0	0	.23
$\mathcal{L}_1[A{:}\{w_1\}, B{:}\{w_2\}, X{:}\{w_2\}]$	0	0	.38
$\mathcal{L}_2[A{:}\{w_1\}, B{:}\{w_2\}, X{:}\{w_1\}]$	.38	0	0

↙ ↓ ↘

l_1

$\mathcal{L}^*$	w_1	w_2	$w_1 \vee w_2$
A	1	0	0
X	.02	.02	.96
A or X	.02	.02	.96

$\mathcal{L}_1$	w_1	w_2	$w_1 \vee w_2$
A	1	0	0
X	0	1	0
A or X	.01	0	.99

$\mathcal{L}_2$	w_1	w_2	$w_1 \vee w_2$
A	1	0	0
X	1	0	0
A or X	1	0	0

↓ ↓ ↓

s_1

$\mathcal{L}^*$	*A*	*X*	*A or X*
w_1	.98	0	0
w_2	0	0	0
$w_1 \vee w_2$	0	.2	.2

$\mathcal{L}_1$	*A*	*X*	*A or X*
w_1	.99	0	0
w_2	0	.33	0
$w_1 \vee w_2$	0	0	.33

$\mathcal{L}_2$	*A*	*X*	*A or X*
w_1	.33	.33	.33
w_2	0	0	0
$w_1 \vee w_2$	0	0	0

↓ ↓ ↓

l_0

$\mathcal{L}^*$	w_1	w_2	$w_1 \vee w_2$
A	1	0	0
X	.33	.33	.33
A or X	.33	.33	.33

$\mathcal{L}_1$	w_1	w_2	$w_1 \vee w_2$
A	1	0	0
X	0	1	0
A or X	.33	.33	.33

$\mathcal{L}_2$	w_1	w_2	$w_1 \vee w_2$
A	1	0	0
X	1	0	0
A or X	1	0	0

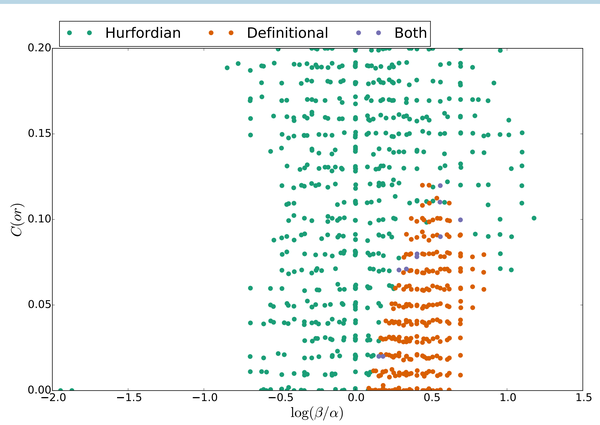
Hurfordian contexts

With high disjunction costs, exclusivization maximizes the justification for the long form; the Hurfordian instinct is a rational response to a disjunction that is unduly prolix for many lexica.

L_2 hears *A or X*	w_1	w_2	$w_1 \vee w_2$
$\mathcal{L}^*[A{:}\{w_1\}, B{:}\{w_2\}, X{:}\{w_1, w_2\}]$	.02	0	.32
$\mathcal{L}_1[A{:}\{\mathbf{w_1}\}, B{:}\{w_2\}, X{:}\{\mathbf{w_2}\}]$	.04	0	.45
$\mathcal{L}_2[A{:}\{w_1\}, B{:}\{w_2\}, X{:}\{w_1\}]$	.03	0	.14

$\alpha = 2$; $\beta = 1$; $C(or) = 1$

Characterization



Summarizes a search over many parameter settings using a large lexicon and large world space.

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