

Some reflections on scalar strength

Laurence Horn, Yale University

<laurence.horn@yale.edu>

Matsumoto (1995) on horizontal vs. vertical scales

In relation to the Quantity-2 Condition, it is important to recognize two kinds of quantity of information, which may be characterized as quantity on the horizontal axis and quantity on the vertical axis. Quantity on the horizontal axis is the amount (strength) of information on physically or socially defined scales such as quantity, temperature, age, height, military rank, etc. For example, the terms *hot* and *warm* represent different values on the horizontal axis of quantity: the term *hot* is used to refer to a range of temperature relatively higher than that of *warm*. Quantity on the vertical axis, on the other hand, refers to the degree of the detailedness or specificity of information, with which a referent or a state is described. For example, the terms *spaniel*, *dog* and *animal*, the terms *100°F* and *hot* (as representing outdoor air temperature), or the terms *the United States*, *California*, and *Los Angeles* differ in detailedness of description. The amount of information measured on the vertical axis can be rephrased as the level of specificity.

(Matsumoto 1995: 27)

The distinction between “horizontal” scales, where S is like W only more so, e.g.

<some, many, most, all>	<or, and>
<warm, hot, boiling>	<satisfactory, good, excellent/superb>
<might, should, must>	<content, happy, ecstatic>
<not all, few, none>	<cheap, free>

and “vertical” ones, where S is more specific than W

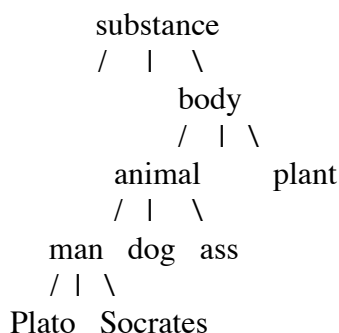
<animal, mammal, dog, spaniel>
 <furniture, chair, armchair>
 <Europe, Germany, Brandenburg, Potsdam>

- PRIVATIVE DYAD—a vertical scale with two elements differing in that

S is marked for a feature/property for which W is unmarked (Horn & Abbott 2012)

<rectangle, square> [+ equilateral]
 <finger, thumb> [+opposability]
 <vegetarian, vegan> [+avoidance of non-meat animal products]
 <her, herself> [+co-referentiality] (Horn 1984a, Levinson 2000)
 <a, the> [+unique] (Horn & Abbott 2012) or [+familiar] (Szabó 2000)
 <go, come>, <that, this>, <there, here> [+speaker-orientation]
 <IMPERFECTIVE, PROGRESSIVE> [+ temporal contingency*] (Deo 2015)
 Sp. copulas <ser, estar> [+boundedness presupposition*] (Sánchez Alonso 2017)
 (*invoked for role in diachronic shift and encroachment)
 Vietnamese passive markers <được/bị> [+ adversativity] (J. Jewell, p.c.)

- The implicit motivation for the metaphor of the “vertical axis” of information is the tradition initiated by PORPHYRY’S TREE, a hierarchical arrangement of ontological categories defined by an irreflexive, asymmetric, and transitive relation.
- Devised by the prominent Aristotelian commentator Porphyry of Tyre (3d c. CE), the tree established the scholastic model of upward and downward inference extending over both of set inclusion and set membership (cf. Sánchez Valencia 1994):



Rules for upward and downward inference (as in Billingham’s *Speculum Puerorum* and Alnwick’s *De Veritate et Falsitate Propositionis*; cf. De Rijk 1982) are based on earlier models in Ockham and Peter of Spain as well as anonymous authors of the late 12th and early 13th centuries and governed by the following *regulae*:

- There is a valid consequence from an inferior to its superior (*ab inferiori ad suum superius*) in the absence of negation or a term having negative force.
- There is a valid consequence from a superior to its inferior (*a superiori ad suum inferius*) with a preposed negation.

Basic level objects in vertical scales (Brown 1965, Rosch 1978 etc., Fodor 1983)

Within any hierarchy, the basic level category is:

- the highest frequency item in token counts
- the earliest and easiest learned item
- often the lowest, least abstract item for which a monomorphemic lexicalization exists and the one yielding a single sign in ASL (Newport & Bellugi 1978)
- the highest, most abstract category whose members are of approximately similar appearance
- the most natural candidate for ostensive definition
- the most natural choice for labeling (“What is this?” “It’s a(n)_____”), ceteris paribus
- phenomenologically “given”, yielding faster perceptual identifications
 <animal, mammal, **dog**, spaniel>; <pet, **dog**, spaniel>
 <furniture, **chair**, armchair>
 <Europe, **Germany**, Brandenburg, Potsdam>
- affect on scalar competition, i.e. the hearer’s likelihood of inferring $\neg K_a(\dots S\dots)$ from an utterance of “W” (Cruse 1977, Hirschberg 1985)

I have two siblings/pets +> one of each (unless QUD explicitly invokes *siblings/pets*)
 vs. I have two children (natural, even if both are sons or both are daughters)

- Role of BASIC LEVEL of classification in triggering implicatures (Hirschberg, citing Rosch)
 - Why < dog, spaniel > may not license weak implicature +> $\neg K_s$ breed of dog
 vs. < animal, dog > or < pet, dog >

Some thoughts on frequency and endpoints

Horn 1972: §2.15 on canonical quantification scales: drawing a distinction between “quantitative scales with defined end-points”, where the negation of the scalar endpoint or absolute element is much more strongly implicated (and more likely inferred by the listener) than is the negation of nonterminal and non-absolute strong scalars

<*some, most*> vs. <*some, all*>, <*most, all*> (implicating against the universal)
sim., <*not all, few/not many, none*>

- Applies to both the relative strength of the *not all* implicature vs. *not many/not most* implicature and the relative strength of implicating against the strongest element in a closed scale (*all, none, certain, empty*) vs. open scale (*enormous, boiling, adore*). See van Tiel et al. 2016 for additional evidence for the “semantic distance” factor

➤ Tendency for the strongest elements on open scales to be relatively less frequent in tokens and not to constitute the **unmarked** term within the scale

➤ In scales like <*OK, good, ..*> it’s unclear what the strongest value is—*excellent? superb?*
<*warm, hot, boiling/sizzling*>
<*cool, cold, freezing/frigid*>
<*attractive, beautiful, stunning/gorgeous*>
<*dislike, hate, loathe/despise*>

- As opposed to scales like <*possible, likely, certain*>, <*some, many, most, all*>, or <*not all, few, none*>, where the highest value is absolute, scales lacking an upper endpoint tend to trigger no robust implicature against highest (non-absolute endpoint) value, which is relatively infrequent and often underspecified
- Similar to subordinate (more specific) vs. basic level in vertical (specificity) scale
- While there may be no overall correlation between frequency and likelihood of recovering upper-bounding implicature (van Tiel et al. 2016: §5.4), it may well play a role in individual cases once other factors are controlled for. For example, infrequency can be overridden by local salience when the QUD is explicit, e.g.

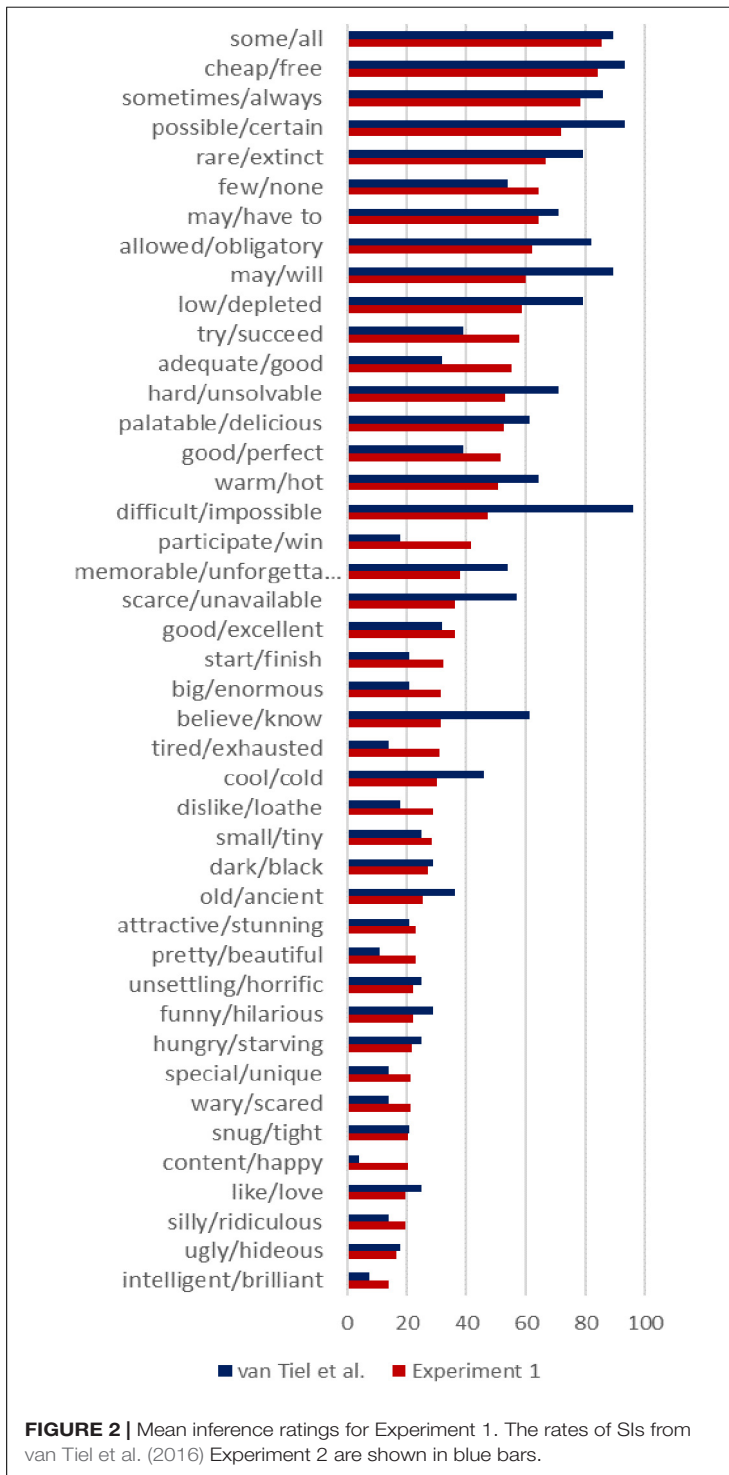
It was warm yesterday and it’s a little bit more than warm today.

(Matsumoto 1995: (39a))

➤ At some point, it would be useful to look more systematically at the relationship between the lexical (degree) scales of Rotstein & Winter and Kennedy & McNally and the semantico-pragmatic “scalemate competition” traditional scales of Horn, Gazdar, Hirschberg, et al.

[one scale including *clean* and *dirty* as opposite poles as on Nicole’s whiteboard?
separate scale defined by degrees of *clean*?
or competitor scales, pos. <*clean, spotless*> vs. neg. <*soiled, dirty, filthy*> scales]

Charting scalar diversity...



(Sun et al. 2018: 6)

- Clearest cases: upper closed scales, where strong values = *absolute, non-gradable endpoints* licensing *completely* and not *very* (Rotstein & Winter 2004, Kennedy & McNally 2005), e.g. <low, *empty*>, <scarce, *absent*>, <cheap, *free*>, <endangered, *extinct*> vs. <warm, *hot*>, <cool, *cold*>, <funny, *hilarious*>, <good, *excellent*>

Other parameters: Local lexical factors affecting specific pairs

- what are the speaker's/hearer's goals?
free is always better than *cheap* but *hot* isn't always better than *warm*
- the difficulty of making sure the scalar competitors differ only in strength
<content, **happy**(, *ecstatic*)>: is *happy* really just *content* only more so?
Easy to attest "happy but not content(ed)", suggesting orthogonal non-scalar relation
<like, **love**, (*adore*)>: cf. *I don't like you but I love you* — "You Really Got a Hold On Me",
Smokey Robinson and the Miracles (1962; <https://tinyurl.com/2t7hmxh3>) > Beatles

Adversative-*but* diagnostic: excluded with true scalar competitors

- #It's not warm but_{PA} it's hot. (vs. *It's not warm, it's hot; It's not warm but_{SN} hot*)
- #It's free but it's not cheap.
- #She's not happy, but she's ecstatic.
- #It's likely they'll win, but it's not possible.

Role of lexicalization (Matsumoto 1995; Horn 1989, 2000)

- **Rectangle** – A parallelogram with four angles of equal size (right angles).
- **Rhombus** – A parallelogram with four sides of equal length.
- **Square** – A parallelogram with four sides of equal length and angles of equal size.

Robin drew a rectangle +>_Q not an equilateral rectangle

Robin drew a rhombus +>_Q not an equiangular rhombus

Robin drew a triangle +>_R an equilateral triangle

Why the asymmetry between *rectangle* and *triangle*?

Cf. *I hurt my finger* vs. *I hurt my toe* (despite anatomical parallel between thumb and big toe)

On scalar strength and the Q/R distinction

➤ **Q/R and rhetorical (assertoric) force**

Chierchia (2004):

- | |
|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <ul style="list-style-type: none">• The correlation of NPI licensing (à la Ladusaw) and SI suspension in downward entailing contexts should be directly predicted and accounted for in terms of the parallel strengthening effect yielded by NPIs and SIs. |
|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|

But does a scalar implicature, in virtue of upper-bounding an assertion, in fact *strengthen* it?
What do we mean by strength?

Carston (1995, 2005, etc.): Q-based and R-based implicature can be collapsed, since 'there is a strengthening of communicated content from "(at least) some" to "some but not all" that is entirely parallel to, say, the strengthening of 'not believing' to 'believing...not'. In addition, a model with one basic principle (relevance) is more economical than a model with two basic principles (my Q and R, or Levinson's Q, I, and M).

- It's not clear that the relevance theoretic model is itself truly unitary, if relevance is defined in terms of a minimax of effort and effects:

"Human cognitive activity is driven by the goal of maximizing relevance: that is... to derive as great a range of contextual effects as possible for the least expenditure of effort"

Some evidence for distinguishing Q and R: a review

➤ Q-based vs. R-based narrowing (Horn 2007)

Q-BASED NARROWING

the existence of a specific hyponym H of a general term licenses the use of the general term for the complement of the extension of H

lion	(including or excluding lionesses)
cat	(including or excluding kittens)
rectangle	(including or excluding squares)
finger	(including or excluding thumbs)
animal	(including or excluding humans, birds, fish) [and cf. primate]

R-BASED NARROWING

a general term denoting a set S narrows to pick out a culturally/socially salient subset of S, allowing the speaker to avoid overtly specifying the (often taboo) subdomain via the assumption that the hearer will fill in the intended meaning

shift complete

smell (INTR.) (milder version of ‘stink’)	poison (orig. ‘potion, drink’)
hound (orig. ‘dog’, as in Ger. <i>Hund</i>)	liquor (orig. ‘liquid substance’)
deer (orig. ‘(wild) animal’, as in Ger. <i>Tier</i>)	wife (orig. ‘woman’)

various euphemisms: disease, accident, undertaker; sleep with, make love; boyfriend, lover; toilet, go to the bathroom, etc.

partial shift, resulting in AUTOHYPONIMY

drink	(in particular [+alcoholic])
color	(in particular ‘hue’, excluding black, white, gray)
temperature	(in particular, one in the ‘fever’ range)
number	(in particular ‘integer’)
man	(orig. ‘human’, now chiefly ‘male adult human’)
Ger. Frau , Fr. femme , Span. mujer	(‘woman’ or, in particular, ‘wife’)

AUTOHYPONIMY occurs when a single term functions both as a superordinate category and one of its own hyponyms (Horn 1984b, Rohdenburg 1985, Becker 2002)

- While *sheep* has two distinct sexually dimorphic hyponyms, *ram* and *ewe*, *lion* is an autohyponym, with an unmarked co-hyponym *lion* alongside a marked one, *lioness*. Similarly for *gander/goose*, *dog/bitch*, *gay/lesbian*, *?man/woman*
- Both Q-based and R-based narrowing, as well as broadening, can yield autohyponymy.
- This provides an alternate perspective on vertical opposition, so that e.g. *finger* (vis-à-vis *thumb*) and *rectangle* (vis-à-vis *square*) can be seen as autohyponyms.

➤ Accounting for the “pragmatic ambiguity” of lexical items or constructions:

<i>not bad</i>	(+> _Q ‘OK’ <u>or</u> +> _R ‘pretty damn good’)
<i>friend</i>	(+> _Q ‘just a friend’ <u>or</u> +> _R ‘an unfriend’, ‘friend-plus’)

➤ Accounting for the different patterns of understandings for lexical clones (Horn 2018):

It's hot but it isn't **HOT** hot.

Do you want a **DRINK** drink (or just something to drink)?

Do you **LIKE** him like him?

I don't need a craft IPA, I'd be happy with a **BEER** beer.

Forget those blockbusters, let's just see a **MOVIE** movie.

Three illustrations (Dray 1987, Horn 1993: fn. 9):

(i) We're living together but we're not **LIVING** together living together.

Oh, we're just **LIVING** together living together.

(Dray 1987)

(ii) Is he a **FRIEND** friend or a sort of **^FRIEND** friend? (1990 episode of "thirtysomething")

(iii) A: Did you hook up?

B: Yeah, we hooked up.

A: Did you **hook UP** hook up?

B: No, we just **hooked up** hooked up. (exchange reported by a Yale undergraduate)

Back to the question under discussion: What do we mean by strength?

(1) *Meredith hasn't recovered yet*: informationally stronger than *Meredith hasn't recovered*.

On one plausible analysis, *yet* adds an epistemic possibility conjunct (at-issue or not):

(1') [\neg Meredith has recovered \wedge POSS_s [Meredith will recover]]

But does the version with *yet* result in a stronger negative assertion?

➤ While R-based implicature increases both the informative *and* assertoric strength (positive or negative) of the assertion, what is communicated via Q-based upper-bounding, while more specific and hence **INFORMATIVELY** stronger than the unbounded utterance, is not **RHETORICALLY** or **ASSERTORICALLY** stronger than the utterance sans implicature

- *some* is consistent with *all*; *some but not all* is inconsistent with *all*
- *some but not all F are G*, while unilaterally entailing *some F are G* (whence the "symmetry problem": cf. Katzir 2007, inter alia) yields a **more specific/more informative** but not a **stronger** positive assertion

An argument from argumentation (cf. Anscombe & Ducrot's "échelles argumentatives")

(2) Because I've graded some (?but not all) of the papers, I'll go out and have a beer.

(3) a. Because it's warm/hot I'll take off my coat.

b. ?Because it's warm but not hot I'll take off my coat.

- Rhetorical or assertoric force \neq informative strength
- **Q-based** strengthening behaves differently from **R-based** strengthening

Rhetorical strength and monotonicity

(4) a. Not only was she able to solve the problem, (in fact) she solved it.

(*a was able to ϕ R-implicates a ϕ 'd*)

b. #Not only is it possible that she solved the problem, (in fact) it's not certain she did.

(*it's possible that p Q-implicates it's not certain that p*)

- Unlike R-based implicature, Q-based scalar upper-bounding implicature has a non-monotonic effect with respect to the question under discussion; it increases the informative but not rhetorical strength of a given assertion (*Some but not all men snore*), in the same way that an ATTENUATING NPI (Israel 1996) increases the informative but not rhetorical strength of a negative utterance (*I haven't been to Potsdam in years*):

The utterance + {NPI} is informatively but not rhetorically stronger than the prejacent:

- (5)a. She hasn't lived in Berlin {long}.
- b. I haven't been to Potsdam {in years}.
- c. Meredith hasn't recovered {yet}. [see (1) above]
- d. He doesn't read {much}.
- e. The milk train doesn't stop here {anymore}.

Scales vs. rank orders as evidence for two kinds of strength

rank orders (Lehrer 1974; Horn 1989, 2009)

< *first-year* | *sophomore* | *junior* | *senior* >

< *lieutenant* | *colonel* | *general* >; < *private* | *corporal* | *sergeant* >

< *D* | *C* | *B* | *A* > [as grades]

< *engaged* | *married* >

< *sick* | *dead* >

< *assistant professor* | *associate professor* | *full professor* >

< ..., *flush* | *full house* | *4 of a kind*,... > [as poker hands]

- “Stronger” elements don't entail “weaker” ones, but rather their negations
- Rank-ordered items essentially build in the upper bound
 - Maria has a flush* vs. *Maria has a full house* are equally informative
 - ditto for *Maria is an associate professor* vs. *Maria is a full professor*
- Yet the first member of each pair is rhetorically (assertorically) stronger than the second:

(6) A: Do you have a flush?

B: {No/#Yes} (in fact) I have a full house.

(7) A: Do you have at least a flush?

B: {Yes/#No} (in fact) I have a full house.

(8) a. I don't {just/#only} have a flush, I have a full house.

b. They're not {just/#only} engaged, they're married.

- We speak of “higher” academic or military ranks or grades, but this notion is parasitic on that of strength—not informative strength but rhetorical strength
- Combined (mix 'n' match) cases: < ***Irish* | *Italian*, *Sicilian*** >
 - “The other Families distrusted him [Don Vito Corleone] because he made you his consigliere and **you're not even Italian, much less Sicilian.**”
 - (Sollozzo to Tom Hagen; Mario Puzo (1969), *The Godfather*, Chapter 3)
- While adjectives and stative verbs naturally fall into traditional scalar relations, nouns are more likely to determine rank orders, presumably based on speakers' propensity to employ nouns to define fixed categories and pigeon-holes rather than to represent degrees of a given property (Bolinger 1980, Wierzbicka 1983).

- Distinguishing the notions of informative and rhetorical strength facilitates a sharper understanding of the reflexes of Q-based (e.g. scalar) and R-based (non-scalar) implicature and provides further evidence for the significance of the distinction between them.

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