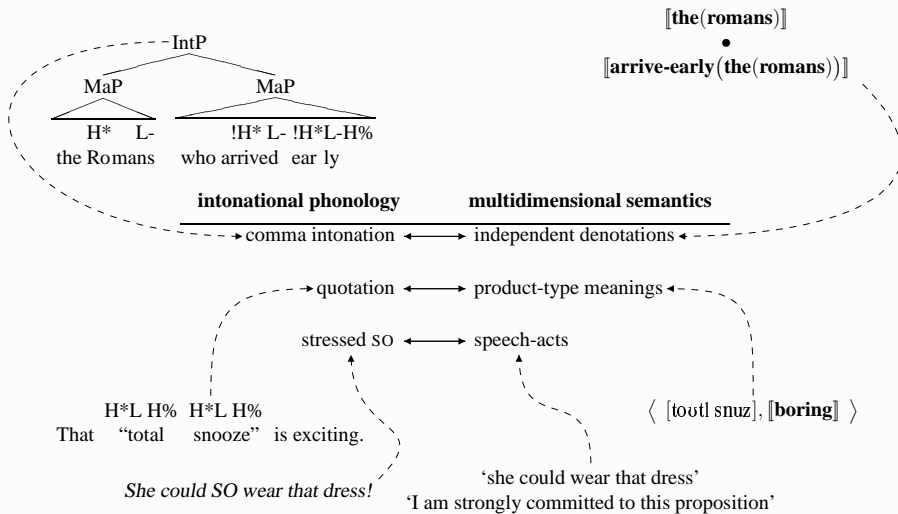


Lexicalized intonational meaning*

Christopher Potts
UMass Amherst

February 23, 2005

1 Separate messages traveling on separate channels



Other issues

- Why is interpreted intonation sometimes phonetically reduced?
- What does interpreted intonation tell us about the design of the grammar?
- What, if anything, does all this have to do with topic/focus semantics?

*The paper associated with this talk is available at <<http://people.umass.edu/potts/papers/potts-umop30.pdf>>.

2 Intonation yields minimal pairs

A playful (but accurate enough) look at the lexical items under investigation:

- (1) a. , — ()
- b. “ ” ‘ ’
- c. SO so so

Apposition and comma intonation

- (2) a. # The linguist, who works on presuppositions, is taller than the linguist, who works on vowel harmony.
- b. The linguist who works on presuppositions is taller than the linguist who works on vowel harmony.

Quotation and the quotative contour

- (3) a. Chris asked for “[æ]pricots”, not “[e]pricots”.
- b. # Chris asked for apricots, not apricots.

Stressed SO and speech-acts

- (4) a. Chris is SO next in line.
- b. *Chris is so next in line.

3 The argument in outline

- (5) a. In each of the (a) examples in (2)–(4), we have some kind of semantic multidimensionality (Bach 1999; Potts 2005).
- b. Intonation is the defining feature of each of the (a) examples in (2)–(4).
- c. It’s no surprise that intonation and multidimensionality arrive together: *separate messages travel more easily on separate channels*.

Some direct influences

- Ward and Hirschberg (1988) and Hirschberg and Ward (1992) on pragmatically contentful tunes
- Kratzer (1999) on discourse particles
- Gunlogson (2001); Truckenbrodt (2004a) on rising declaratives
- Karttunen and Peters (1979); Bach (1999) on multidimensional denotations

4 Comma intonation

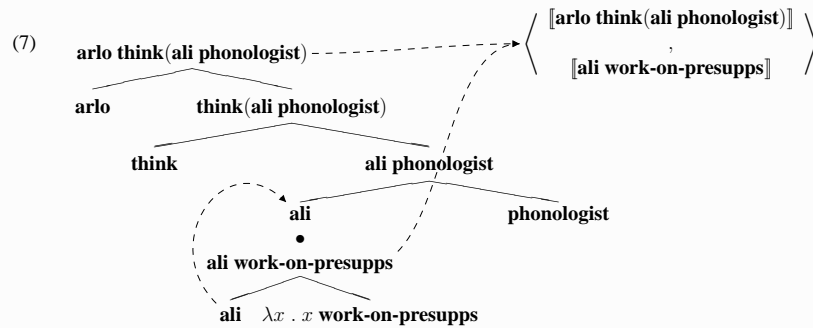
The commas in (6), like those in (2a), are to be taken seriously.

(6) Arlo thinks that Ali, who works on presuppositions, is a phonologist.

4.1 On supplementary relatives

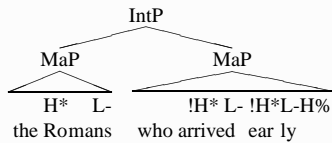
- i. adjoin as DP modifiers (Potts 2005)
- ii. extremely wide syntactic distribution (Huddleston and Pullum 2002)
- iii. can modify all nonquantificational DPs, predicates, and clauses (McCawley 1998)
- iv. uniformly widest semantic scope (Emonds 1976, 1979; Potts 2005)
- v. introduce new but typically secondary information — commentary (Asher 2000)

4.2 What we'd like from the syntax and semantics

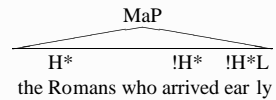


4.3 The contrast on hearing them

(8) supplementary relative



(9) restrictive relative



(Selkirk 2004)

4.4 A type-theoretic contrast

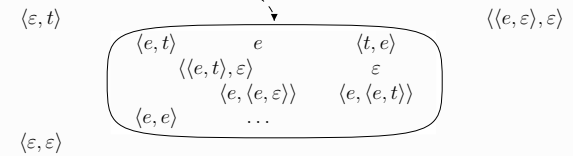
(10) semantic types

- a. e and t are regular types
- b. [... see (24) ...]
- c. ε is a conventional-implicature type
- d. if σ and τ are regular types, then $\langle \sigma, \tau \rangle$ is a regular type
- e. [... see (26) ...]
- f. if σ is a regular type and τ is a conventional-implicature type, then $\langle \sigma, \tau \rangle$ is a conventional-implicature type
- g. nothing else is a type

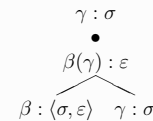
(11) domains

- a. the domain for type e is D_e , a set of entities
- b. the domain for type t is D_t , a set of propositions
- c. [... see (25) ...]
- d. the domain for type $\langle \sigma, \tau \rangle$ is $D_{\langle \sigma, \tau \rangle}$, the set of all functions from D_σ into D_τ
- e. [... see (27) ...]
- f. the domain for type ε is D_ε , the set of conventionally-implicated meanings

(12) semantic workspace



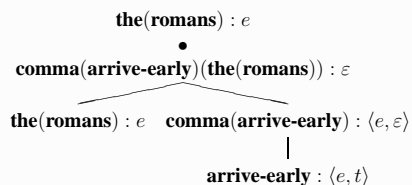
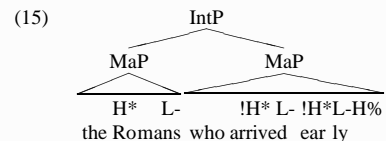
(13) multidimensional application



4.5 Comma intonation in the lexicon

(14) comma intonation

$\langle (\text{IntP}/_L \text{MaP})/_R \text{MaP} \ , \ \lambda f \lambda x . f(x) : \langle \langle e, t \rangle, \langle e, \varepsilon \rangle \rangle \rangle$



$$\text{comma} \stackrel{\text{def}}{=} \lambda f \lambda x . f(x) : \langle \langle e, t \rangle, \langle e, \varepsilon \rangle \rangle$$

5 Intonational reductions

5.1 Experimental results

Watson and Gibson (2004) presented subjects with examples like those in (16) and asked them to read them aloud for listeners.

- (16) a. **restrictive interpretation of a subject relative**
 A group of film critics praised a director at a banquet and another director at a film premiere. *The director who the critics praised at a banquet insulted an actor from an action movie during an interview.*
- b. **nonrestrictive interpretation of a subject relative**
 A group of film critics praised a director and a producer. *The director who the critics praised at a banquet insulted an actor from an action movie during an interview.*

Results

(17) percentage of pre-relative clause intonational boundaries

	subject modifier	object modifier
restrictive interpretation	10.0%	38.6%
nonrestrictive interpretation	27.7%	49.1%

Watson and Gibson (2004:47)

As expected, discourse structure appears to play a role in determining intonational phrase placement. In particular, relative clauses with non-restrictive readings and relative clauses that modified a direct object were more likely to be preceded by an intonational phrase boundary than relative clauses with restrictive interpretations and relative clauses that modified a subject. These data suggest that speakers use intonational boundaries to disambiguate relative clauses.

Why aren't the percentages higher for the nonrestrictive boundaries?

5.2 Intonational-reductions conjecture

- (18) Intonational effects are often reduced when the (linguistic or extra-linguistic) context biases in favor of the interpretation it would deliver.

5.3 Predictions of (18)

Interrogatives and declaratives In languages where declaratives and polar interrogatives are distinguished only by a specific contour, we should find that contour phonetically reduced when

- i. the speaker is not in a position to assert the declarative's content (and thus the maxim of quality favors an interrogative reading).
- ii. the sentence contains a discourse particle that appears only in interrogatives (or only in declaratives).
- iii. the sentence is coordinated with a declarative (interrogative).

Association with focus When the focus associate of an expression like *only* is clear from the context, the focal stress can be reduced. (Written language provides many supporting examples.)

Though strict grammarians insist that the rule for placement of *only* should always be followed, there are occasions when placement of *only* earlier in the sentence seems much more natural, and if the context is sufficiently clear, there is no chance of being misunderstood. *(American Heritage Dictionary)*

- (19) We think Matt and Tanja will show up, but Kathryn *only* thinks that Michael will.

Comma intonation The introductory comma intonation of a supplementary relative can be reduced, perhaps even eliminated from the phonetic representation, if the head noun cannot be interpreted restrictively

- i. in virtue of something about the sentence (e.g., the anchor is a determiner-free proper name).
- ii. in virtue of something about the context more generally.

- (20) Chris who studies about intonational meaning, was confused.

- (21) a. The syntactician and the semanticist were alone in the restaurant. The syntactician who works on relative clauses ordered the tofu.
- b. The syntactician who works on relative clauses spoke with the syntactician who works on control.

6 The quotative contour

From Word Court, By Barbara Wallraff, *The Atlantic Monthly*, May 2002 (p. 116):

DAVID RADWIN, of Berkeley, Calif., writes, “How does one vocalize the quotation marks that begin and end a quotation? Are quote and unquote correct?”

If you want to get technical, you can say quote and close (the opposite of open, not the opposite of far) quote instead. [...] Oddly, these words are often said together. For instance, from a February CNN transcript: “...had phone calls made to three–quote unquote–‘prominent Indian government officials.’” How the listener is supposed to know where the quotation ends I have no idea.

No idea? Wow. The person making the CNN transcript figured it out.

(22) They made phone calls to three “prominent Indian government officials”.

H* L H% H*L H% H* L H% H*L H%

6.1 Lexicalization hypothesis

(23) In quotation, each prosodic word projects to its own intonational phrase with a rise–fall–rise contour.

- In print, speakers use quotation marks and related devices.
- In speech, they sometimes use body language.



6.2 Semantic analysis

(24) u is a regular type

(25) D_u is the domain of linguistic objects

(26) **product types**

if σ and τ are regular types, then $\sigma \times \tau$ is a regular type

(27) **product domain**

the domain of $\sigma \times \tau$ is $D_\sigma \times D_\tau$, the set of all ordered pairs in which the first member is drawn from D_σ , the second from D_τ

(28) a. “[æ]pricots” \rightsquigarrow [apricots · \ulcorner [æ]pricots \urcorner] : $\langle e, t \rangle \times u$
where u is the type of linguistic objects

b. \llbracket [apricots · \ulcorner [æ]pricots \urcorner] \rrbracket = $\left\langle \begin{array}{l} \text{the set of all apricots} \\ , \\ \text{the linguistic object [æ]pricots} \end{array} \right\rangle$

6.3 A different kind of multidimensionality

The multidimensionality of quotation is more integrated into the compositional semantics than the multidimensionality of supplementary relatives. Compare:

- (29) Whenever he is in Amherst, Chris asks for “[æ]pricots”.
- Whenever Chris is in Amherst, Chris asks for apricots
 - Whenever Chris is in Amherst, x says [æ]pricots
- (30) Arlo thinks that Ali, who works on presuppositions, is a phonologist.

Technical route to the contrast Both supplements and quotations define tuples of meanings. But

- expressions with product-types are part of the logic, so we can define operators that take them as arguments (Potts 2005:§7) (even if one dimension turns out to be pragmatic; von Stechow 2004; Chierchia 2004); whereas
- expressions formed as in (13) are not part of the logic, so nothing can take them as arguments.

6.4 Quotation is not focus

6.4.1 Quotation does not involve a focal stress pattern

(31) They didn’t call reporters, they called prominent Indian government officials.

H* L H* L

6.4.2 Quotation and focus are subject to different discourse conditions

- (32) a. Burns: *The Godfather II* is a total snooze.
b. # Homer: *Godfather I* is a TOTAL SNOOZE as well.

In contrast, quoted material must be given, in the sense that it nearly always requires an identical string to precede it in the discourse:

- (33) a. Burns: *The Godfather II* is a total snooze.
b. Homer: Well, Pauline Kael said that this “total snooze” is a defining moment in American cinema.

differing felicity conditions

Contrastive focus on a phrase P presupposes that the preceding discourse contains a phrase P' that is a member of P ’s comparison class and distinct from P .
quotation of a phrase P is felicitous only if the preceding discourse contains an utterance of that is as close as possible to P itself.

P'	P
\vdots	\vdots
$P \neq P'$	P

7 Speech-act SO

7.1 Unstressed so

Unstressed *so* combines only with gradable predicates (like *very* and *really*):

- (34) a. Ed is so angry he could scream.
 b. *The number 7 is so prime that it is often used in examples.

Unstressed *so* modifies only adjectives:

- (35) a. *Ali so ran the marathon.
 b. *The road so surrounds the campus.

7.2 Speech-act SO

Speech-act SO has a much freer distribution. While it retains something like a degree-based semantics, it can appear as the syntactic modifier of nongradable predicates, (36), and it can adjoin to the left edge of the verb phrase, (37).

- (36) a. I am SO looking forward to your being here.
 b. I am SO next in line.
 (37) a. Ali could SO run win that race.
 b. Nancy could SO wear that dress.

7.3 Semantic contrast

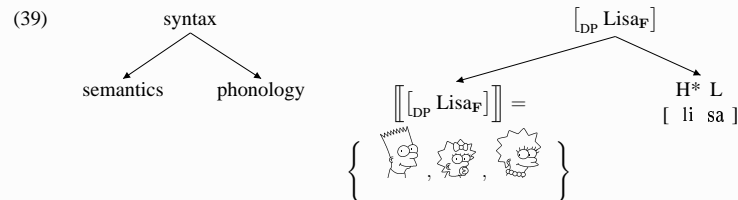
- Unstressed *so* takes arguments in $\langle d, \langle e, t \rangle \rangle$.
- Speech-act SO takes arguments in $\langle s, t \rangle$ into pairs consisting of
 - i. the argument proposition (call it p); and
 - ii. the proposition that the speaker is strongly committed to p

$$(38) \quad \llbracket \text{SO}(s \text{ be next-in-line}) \rrbracket = \left\langle \llbracket s \text{ be next-in-line} \rrbracket, \llbracket [s] \text{ is strongly committed to } [s \text{ be next-in-line}] \rrbracket \right\rangle$$

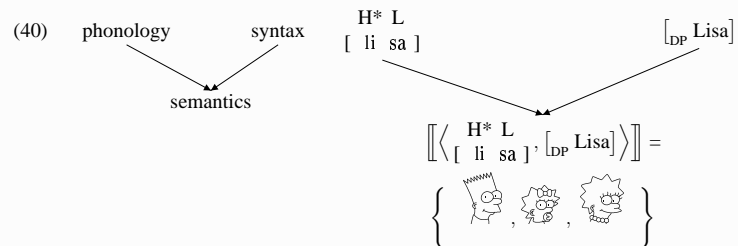
We might look to proposals like that of Krifka (2001) to characterize it in terms of the theory of speech-acts (Searle 1969). (But see Geurts and Maier 2003 and Truckenbrodt 2004b for more conservative alternatives.)

8 The design of the grammar

8.1 A stripped down Y-model (as in Minimalism)

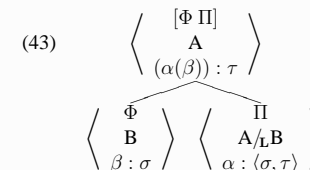
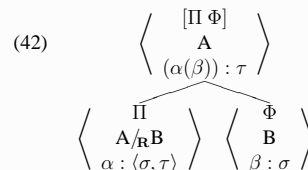


8.2 Interpreted \langle phonology, syntax \rangle



8.3 All together (Bach and Wheeler 1981; Jakobson 1999)

- (41) \langle [hoʊməɹ] ; NP ; homer : e \rangle
 \langle [bɔld] ; S/LNP ; bald : $\langle e, t \rangle$ \rangle
 \langle [si] ; (S/LNP)/RNP ; see : $\langle e, \langle e, t \rangle \rangle$ \rangle



9 What's next?

These are by no means the only examples in which intonation and meaning interact in a way that seems partially or totally lexical.

9.1 vice versa

(44) Ali introduced Chris to Wesley, and vice versa.

- a. *vice versa* ≈ Ali introduced Wesley to Chris
- b. *vice versa* ≈ Chris introduced Ali to Wesley
- c. ...

9.2 Discourse-particle pairs

- (45) a. Hein ist wohl auf See.
Hein is presumably on sea
'Hein is at the beach, isn't he?'
- b. #Hein ist WOHL auf See. (Zimmermann 2004:3, 30)
Hein is most-definitely on sea
'Hein is most definitely at the beach.' (a reaction to a previous claim that Hein isn't.)

9.3 Lexicalized intonational phonology: An oxymoron?

Ladd (1996:6):

intonation conveys meanings that apply to phrases or utterances as a whole, such as sentence type or speech act, or focus and information structure. By this definition, intonation excludes features of stress, accent, and tone that are determined in the lexicon, which serve to distinguish one word from another.

- The above analyses are lexical.
- But the elements in question seem clearly to be grounded in intonation.

Terminological dispute, or path towards a better understanding of the way that intonation can give rise to distinguished dimensions of meaning?

Acknowledgements

Many thanks to the participants in the 2004 Intonation Matters Workshop at UMass, especially its organizers, Angelika Kratzer and Lisa Selkirk. I'm grateful to Lyn Frazier for helping me to see the intuitive (multi-channel) connection between intonational meaning and semantic multidimensionality. Thanks also to Jan Anderssen, Ash Asudeh, Kai von Stechow, Francesca Foppolo, John Kingston, Manfred Krifka, Tom Roeper, Florian Schwarz, Matt Wolf, and the audience at the University of Maryland, where I presented an earlier version of this work on October 1, 2004.

References

- Asher, Nicholas. 2000. Truth conditional discourse semantics for parentheticals. *Journal of Semantics* 17:31–50.
- Bach, Emmon and Deirdre Wheeler. 1981. Montague phonology: A first approximation. In Wynn Chao and Deirdre Wheeler, eds., *University of Massachusetts Occasional Papers*, 27–45. Amherst, MA: GLSA.
- Bach, Kent. 1999. The myth of conventional implicature. *Linguistics and Philosophy* 22(4):367–421.
- Chierchia, Gennaro. 2004. Scalar implicatures, polarity phenomena, and the syntax/pragmatics interface. In Adriana Belletti, ed., *Structures and Beyond*. Oxford: Oxford University Press.
- Emonds, Joseph E. 1976. *A Transformational Approach to English Syntax*. New York: Academic Press.
- Emonds, Joseph E. 1979. Appositive relatives have no properties. *Linguistic Inquiry* 10(2):211–243.
- von Stechow, Kai. 2004. How multi-dimensional is quotation? URL <http://mit.edu/fintel/www/pottsquotecomments.pdf>, Handout, Harvard-MIT-UCConn Workshop on Indexicals, November 20.
- Geurts, Bart and Emar Maier. 2003. Layered DRT. URL <http://www.kun.nl/phil/tfl/bart/papers/ldrt.pdf>, Ms., University of Nijmegen.
- Gunlogson, Christine. 2001. *True to Form: Rising and Falling Declaratives as Questions in English*. Ph.D. thesis, UC Santa Cruz.
- Hirschberg, Julia and Gregory Ward. 1992. The influence of pitch range, duration, amplitude and spectral features on the interpretation of the rise-fall-rise intonation contour in English. *Journal of Phonetics* 20:241–251.
- Huddleston, Rodney and Geoffrey K. Pullum. 2002. *The Cambridge Grammar of the English Language*. Cambridge: Cambridge University Press.
- Jacobson, Pauline. 1999. Towards a variable-free semantics. *Linguistics and Philosophy* 22(2):117–184.
- Karttunen, Lauri and Stanley Peters. 1979. Conventional implicature. In Choon-Kyu Oh and David A. Dinneen, eds., *Syntax and Semantics*, Volume 11: Presupposition, 1–56. New York: Academic Press.
- Kratzer, Angelika. 1999. Beyond *ouch* and *oops*: How descriptive and expressive meaning interact. A comment on David Kaplan's paper Cornell Conference on Theories of Context Dependency. URL <http://semanticsarchive.net/Archive/WEwNGUyO/>.
- Krifka, Manfred. 2001. Quantifying into question acts. *Natural Language Semantics* 9(1):1–40.
- Ladd, D. Robert. 1996. *Intonational Phonology*. Number 79 in Cambridge Studies in Linguistics. Cambridge: Cambridge University Press.
- McCawley, James D. 1998. *The Syntactic Phenomena of English*. Chicago: Chicago University Press, 2 ed.
- Potts, Christopher. 2005. *The Logic of Conventional Implicatures*. Oxford Studies in Theoretical Linguistics. Oxford: Oxford University Press. [Revised 2003 UC Santa Cruz PhD thesis].
- Searle, John. 1969. *Speech Acts: An Essay in the Philosophy of Language*. Cambridge: Cambridge University Press.
- Selkirk, Elisabeth. 2004. Comments on intonational phrasing in English. In Sónia Frota, Marina Vigário, and Maria Joao Freitas, eds., *Prosodies*. The Hague: Mouton de Gruyter.
- Truckenbrodt, Hubert. 2004a. Sentence-type meanings, Ms., Universität Tübingen.
- Truckenbrodt, Hubert. 2004b. Zur Strukturbedeutung von Interrogativsätzen. *Linguistische Berichte* 199.
- Ward, Gregory and Julia Hirschberg. 1988. Intonation and propositional attitude: The pragmatics of L*+H. In *Proceedings of the Fifth Eastern States Conference on Linguistics*, 512–522.
- Watson, Duane and Edward Gibson. 2004. The relationship between intonational phrasing and syntactic structure in language production. *Language and Cognitive Processes* 19.
- Zimmermann, Malte. 2004. Zum wohl: Diskurspartikeln als Satztypmodifikatoren. *Linguistische Berichte* 199:1–35.