# Dennison & Schafer (2010) plus related background materials

Mike Frank

Psych/Ling 236

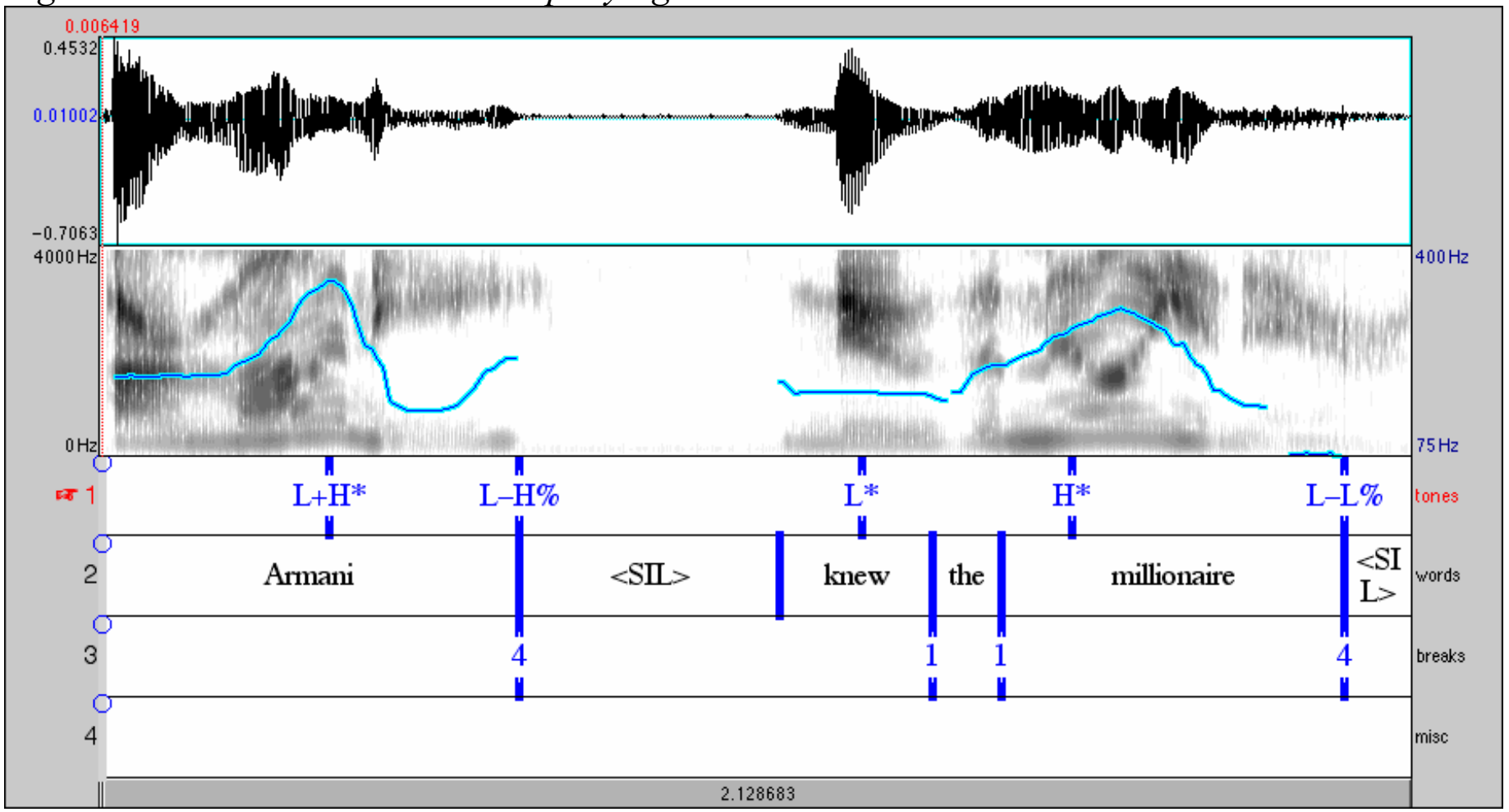
5/7/12

# Intonation and meaning

- Intonation is a continuous, multidimensional space
  - Production and comprehension are noisy
  - (Similar to general phoneme perception? Or unlike discrete word choice?)
- Intonation modulates interpretation
  - Reflects information structure
  - Hence can lead to significant implicatures (e.g. about information structure)

# ToBI labeling

*Figure 1: armani1.wav with accompanying Praat TextGrid.* <armani1>




Silverman et al. (1992)

# Prosodic phrasing

- 2 `levels' of phrasing in ToBI
  - intermediate phrase: one or more pitch accents plus a phrase accent (H- or L-)
  - intonational phrase: one or more intermediate phrases + boundary tone (H% or L%)
- ToBI break-index tier
  - 0 no word boundary
  - 1 word boundary
  - 2 strong juncture with no tonal markings
  - 3 intermediate phrase boundary
  - 4 intonational phrase boundary

# ToBI accent types

- Accent: Which items are made intonationally prominent and how?
- Accent type:


– H* simple high (declarative)


– L* simple low (ynq)

– L*+H scooped, late rise (uncertainty/


incredulity)

– L+H* early rise to stress (contrastive focus)


– H+!H* fall onto stress (implied familiarity)

# ToBI reliability – Dilley, Breen, et al. (2006)

- To what extent do expert raters agree on what pitch accent it is?
- TSP = percent agreement
- Kappa = chance-corrected agreement
- General agreement on qualitative details, but some disagreement on particular accents / boundaries

| | TSP | | Kappa | |
|---|---|---|---|---|
| | ToBI | RaP | ToBI | RaP |
| Presence of a pitch accent | 87% | 86% | 0.71 | 0.71 |
| Type of pitch accent | 80% | 80% | 0.68 | 0.65 |
| Presence of a phrasal boundary | 88% | 92% | 0.66 | 0.74 |
| Type of phrasal boundary | 76% | 84% | 0.40 | 0.61 |

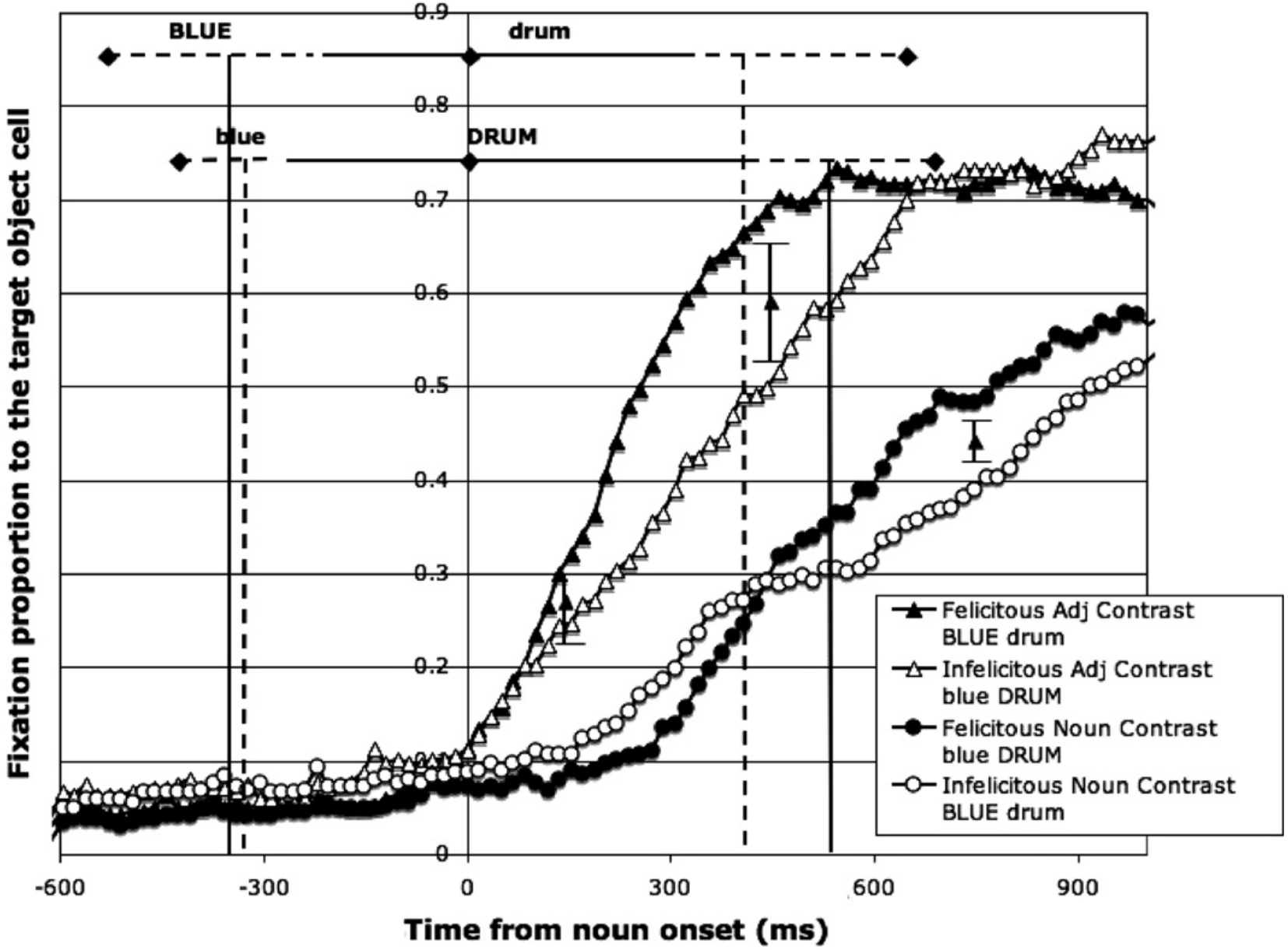
# Ito & Speer (2008) – Pitch accent matters

Table 1
Experiment 1: Information status and accent pattern for the critical four conditions

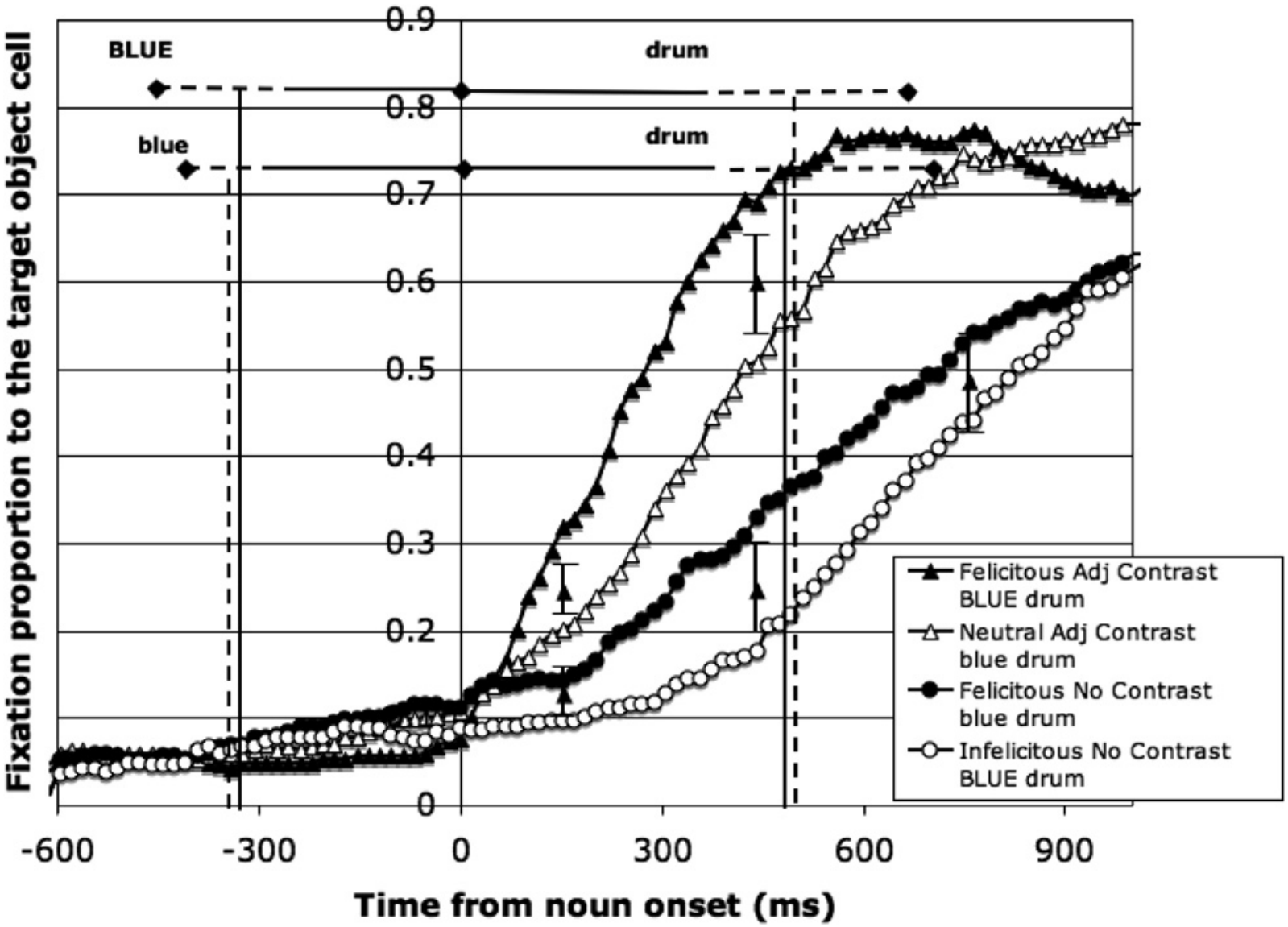
| Type of mention | Preceding context | Target instruction with accent specification |
|---|---|---|
| Critical conditions | | |
| Felicitous Adj Contrast | . . . green drum → | $\mathrm{BLUE}_{\mathrm{L+H^*}}$ $\mathrm{drum}_{\mathrm{no\ accent}}$ |
| Infelicitous Adj Contrast | . . . green drum → | $\mathrm{blue}_{\mathrm{H^*}}$ $\mathrm{DRUM}_{\mathrm{L+H^*}}$ |
| Felicitous N Contrast | . . . blue onion → | $\mathrm{blue}_{\mathrm{H^*}}$ $\mathrm{DRUM}_{\mathrm{L+H^*}}$ |
| Infelicitous N Contrast | . . . blue onion → | $\mathrm{BLUE}_{\mathrm{L+H^*}}$ $\mathrm{drum}_{\mathrm{no\ accent}}$ |

*Note:* Adj, Adjective; N, Noun. → indicates immediate adjacency between the target trial and the preceding trial.

# Ito & Speer (2008) – Pitch accent matters

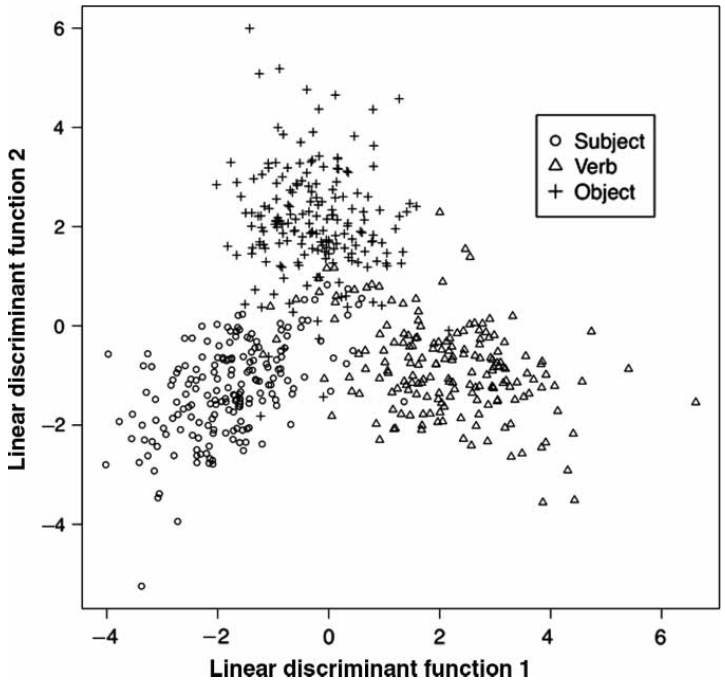


# Ito & Speer (2008) – Pitch accent matters



# Breen et al. (2010) – Producing focus

| *Condition* | *Focus type* | *Focused argument* | *Setup question* |
|---|---|---|---|
| 1 | Noncontrastive | Wide | What happened this morning? |
| 2 | Noncontrastive | S | Who fried an omelet this morning? |
| 3 | Noncontrastive | V | What did Damon do to an omelet this morning? |
| 4 | Noncontrastive | O | What did Damon fry this morning? |
| 5 | Contrastive | S | Did Harry fry an omelet this morning? |
| 6 | Contrastive | V | Did Damon bake an omelet this morning? |
| 7 | Contrastive | O | Did Damon fry a chicken this morning? |



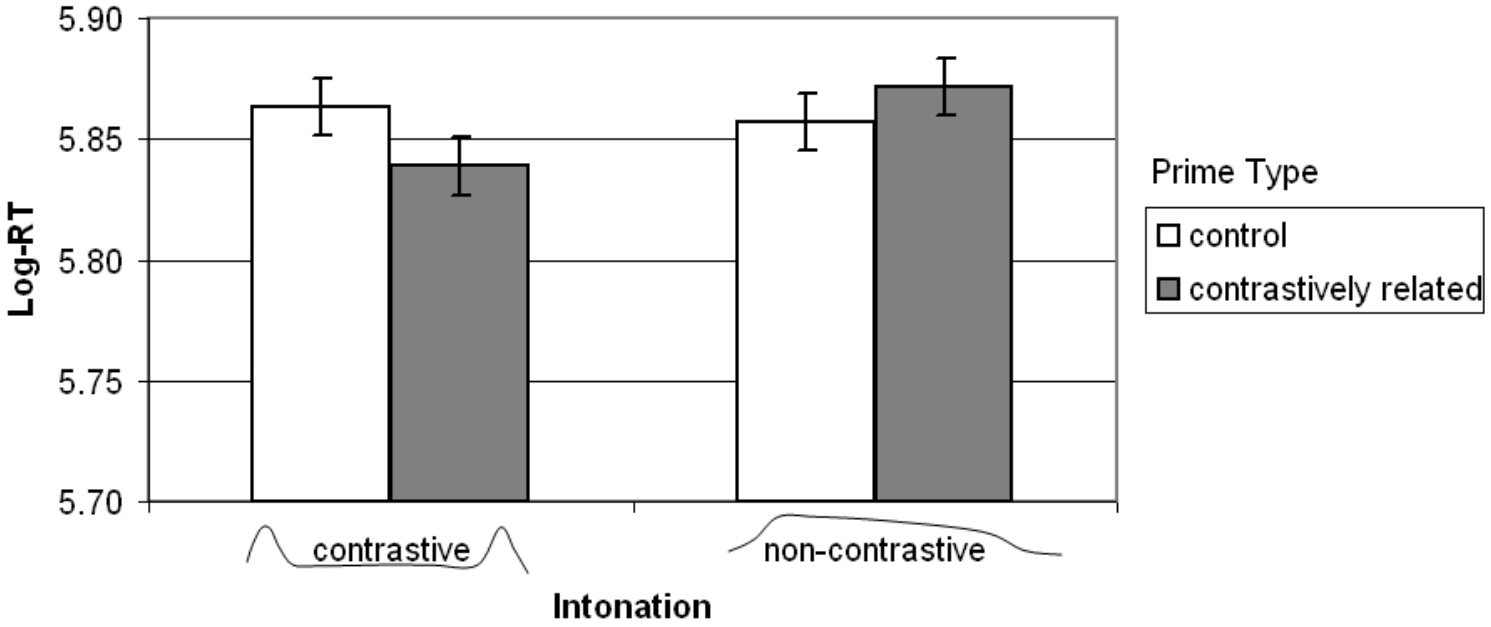

Argument (QUD) was always differentiated, but focus type needed to be made explicit to participants (even in an explicit communication task) before it was differentiated in prosody

# Braun & Tagliapietra (2010) - alternatives

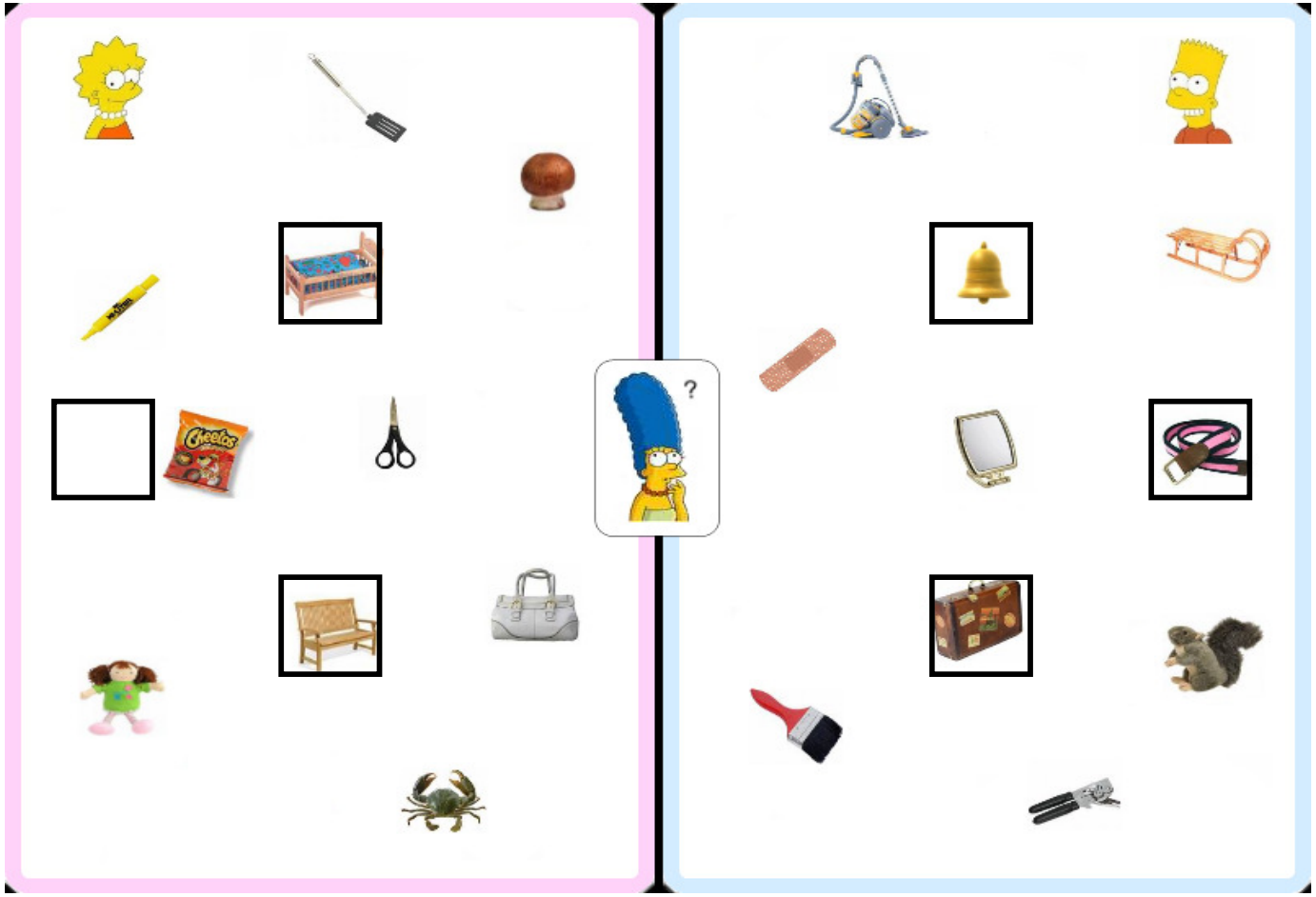
In Florida he photographed a [flamingo/FLAMINGO]

Flamingo (prime), Pelican (contrastive related), Pink (non-contrastive related), Celebrity (distinct)

Figure 3: Mean Log-RTs for Experiment 1a (contrastive visual targets) as a function of the experimental conditons: intonation (contrastive vs. non-contrastive) and Prime Type (control vs. related). Error bars represent standard error



# Dennison & Schafer (2010)




Lisa HAD the bell…

| | Sentences and Tunes | Object location | | Truth |
|---|---|---|---|---|
| | | L's | B's | |
| C1 | L+H* L-H%<br>Lisa HAD the bell.<br>(contrastive) | | bell | True |
| C2 | L+H* L-L%<br>Lisa HAD the bell.<br>(emphatic) | | bell | *False* |
| C3 | L+H* L-L%<br>Lisa HAD the bell.<br>(emphatic) | bell | | True |
| C4 | H* H*L-L%<br>LISA had the BELL.<br>(neutral) | bell | | True |
| C5 | L+H* L-H%<br>Bart DIDN'T have the bee.<br>(contrastive) | | bee | True |
| C6 | L+H* L-L%<br>Bart DIDN'T have the bee.<br>(emphatic) | | bee | *False* |
| C7 | L+H* L-L%<br>Bart DIDN'T have the bee.<br>(emphatic) | bee | | True |
| C8 | H* H* H*L-L%<br>BART DIDN'T have the BEE.<br>(neutral) | bee | | True |

Design:

3 (emph/cont/neut)
2 (location)
2 (neg/pos)

= 12 conditions

**Why only 8 used?**

(note also confound between affirmative/Lisa, neg/Bart)

# Predictions

| | Sentences and Tunes | Object location | | Truth |
|---|---|---|---|---|
| | | L's | B's | |
| C1 | L+H* L-H%<br>Lisa HAD the bell.<br>(contrastive) | | bell | True |
| C2 | L+H* L-L%<br>Lisa HAD the bell.<br>(emphatic) | | bell | *False* |
| C3 | L+H* L-L%<br>Lisa HAD the bell.<br>(emphatic) | bell | | True |
| C4 | H* H*L-L%<br>LISA had the BELL.<br>(neutral) | bell | | True |
| C5 | L+H* L-H%<br>Bart DIDN'T have the bee.<br>(contrastive) | | bee | True |
| C6 | L+H* L-L%<br>Bart DIDN'T have the bee.<br>(emphatic) | | bee | *False* |
| C7 | L+H* L-L%<br>Bart DIDN'T have the bee.<br>(emphatic) | bee | | True |
| C8 | H* H* H*L-L%<br>BART DIDN'T have the BEE.<br>(neutral) | bee | | True |

**A)** L+H* should make alternatives salient, regardless of boundary tone (final intonation)

**B)** L+H* should only make alternatives salient in the case that boundary tone supports this inference ("compositional prosody")

| | Sentences and Tunes | Object location | | Truth |
|---|---|---|---|---|
| | | L's | B's | |
| C1 | L+H* L-H%<br>Lisa HAD the bell.<br>(contrastive) | | bell | True |
| C2 | L+H* L-L%<br>Lisa HAD the bell.<br>(emphatic) | | bell | *False* |
| C3 | L+H* L-L%<br>Lisa HAD the bell.<br>(emphatic) | bell | | True |
| C4 | H* H*L-L%<br>LISA had the BELL.<br>(neutral) | bell | | True |
| C5 | L+H* L-H%<br>Bart DIDN'T have the bee.<br>(contrastive) | | bee | True |
| C6 | L+H* L-L%<br>Bart DIDN'T have the bee.<br>(emphatic) | | bee | *False* |
| C7 | L+H* L-L%<br>Bart DIDN'T have the bee.<br>(emphatic) | bee | | True |
| C8 | H* H* H*L-L%<br>BART DIDN'T have the BEE.<br>(neutral) | bee | | True |

**Table 3.** Mean mouse click RTs from participants (in milliseconds, measured from the offset of the sentence)

| Condition | Affirmative set | | Negative set | |
|---|---|---|---|---|
| Contrastive true | C1 | 1973 | C5 | 1675 |
| Emphatic false | C2 | 2220 | C6 | 1571 |
| Emphatic true | C3 | 1181 | C7 | 1533 |
| Neutral true | C4 | 1072 | C8 | 1458 |

# Interpretation?

- "But if negative sentences evoke the stated meaning and the contradictory meaning, we would see a shift in visual attention that includes the alternative room as well as the current room: an expansion of the search fields from Bart's room alone to the whole space. The expansion of visual search fields upon the word *didn' t* would then greatly reduce differences in mouse click RTs across the four conditions, because participants would be rigorously scanning items in both rooms as the rest of the linguistic information unfolds, regardless of the prosodic pattern."