



Contextual Effects on Prosody: Focus Antecedence vs. Accessibility

Experimental and Theoretical Advances in Prosody 2

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Some Factors Affecting Prominence

- **Repetition:** Words are realized as less prominent the more often they are repeated (Watson 2010)
- **Thematic Accessibility:** Certain thematic roles are more accessible than others; e.g. THEME > GOAL (Gordon et al. 1993, Dahan et al. 2002)
- **Focus Antecedence:** Prosodic prominence shifts depending on whether or not there is an appropriate antecedent to mark linguistic focus (Rooth 1985 et seq.)

Watson et al. 2005: Repetition and Accessibility

Reported in Watson 2010

➤ Several factors are said to affect sentence prosody; for example:

- **Repetition**
- **Thematic accessibility**

➤ **The experiment:**

A: 2-Theme condition	B: 1-Theme condition
Put the bed above the flag.	Put the piano above the flag.
Put the bed above the house.	Put the bed above the house.
Put the bed above the pineapple.	Put the bed above the pineapple.
C: 1-Goal condition	D: New condition
Put the piano above the flag.	Put the piano above the flag.
Put the house above the bed .	Put the house above the bell.
Put the bed above the pineapple	Put the bed above the pineapple.

Results

- **Repetition:** more repetitions, lower intensity, duration and prominence ratings
A < B, C < D
- **Thematic accessibility:** more reduction with THEME antecedents than GOAL antecedents
A, B < C

A Potential Confound: Focus Antecedence

➤ **The thematic accessibility effect might actually be due to different focus antecedents:**

"THEME antecedent": Single Contrast

CONTEXT: Put the bed above the house Antecedent of form: [put the bed above the x]
TARGET: Put the bed above the [pineapple]_F

"GOAL antecedent": Double Contrast

CONTEXT: Put the house above the bed. Antecedent of form: [put the x above the y]
TARGET: Put the [bed]_F above the [pineapple]_F

In both conditions, an antecedent of the appropriate form is found within the context, with potential effects on sentence prosody

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1 Experiment 1: Focus Antecedence vs. Accessibility

- Experiment 1 uses stimuli similar to Watson et al. 2005, but switches the word order, such that accessibility and focus antecedence are de-correlated
- The goal is to find out which of the two factors have an effect: It could be that we find two independent effects, or that only one is responsible
- In addition, we manipulated repetition, to see how repetition and focus antecedence interact

Predictions for Watson 2010:

Condition:	Shift	No Shift
Accessibility	Not reduced	Reduced
Focus Antecedence	Not reduced	Reduced

Predictions for Experiment 1:

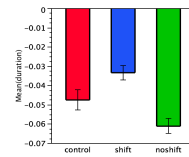
Condition:	Shift	No Shift
Accessibility	Reduced	Not reduced
Focus Antecedence	Not reduced	Reduced

Stimuli & Methods

Repetitions	Shift	No Shift
2	Move the bed above the flag. Now, move the bed above the house. Now, move the pineapple above the bed .	Move the piano above the bed . Now, move the house above the bed . Now, move the pineapple above the bed .
1	Move the piano above the flag. Now, move the bed above the house. Now, move the pineapple above the bed .	Move the piano above the flag. Now, move the house above the bed . Now, move the pineapple above the bed .
CONTROL:	Move the piano above the flag. Now, move the house above the bell. Now, move the pineapple above the bed .	

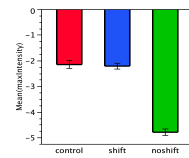
- 90 participants, Latin-square design
- 35 items modeled after those in Table 1
- Production experiment: participants were recorded reading each sentence aloud
- Results analyzed in a mixed model regression (random effect: item & participants, fixed effect: SHIFT); p-values estimated through MCMC sampling

Results



NORMALIZED LOG DURATION

- "Bed" in **Shift** condition **not** significantly smaller than control ($t=-0.22$, $p<0.82$)
- Contrary to predictions of accessibility view
- "Bed" in **No Shift** condition significantly smaller than control ($t=-6.22$, $p<0.0001$)
- As predicted by focus antecedence, contrary to prediction of accessibility view



NORMALIZED MAXIMUM INTENSITY

- "Bed" in **Shift** condition **not** significantly smaller than control ($t=0.40$, $p<0.69$)
- "Bed" in **No Shift** condition significantly smaller than control ($t=-13.91$, $p<0.0001$)

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Watson, D., & Tanenhaus, M. K. (2005). Not just what you say: The effects of discourse and task-based constraints on acoustic prominence. Poster at the 2005 CLIN Human Sentence Processing Conference, Tucson, AZ.
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2 Experiment 2: Replication of Watson et. al 2005

- To directly compare the data from Experiment 1 with the paradigm elicited in Watson et al. 2010, we collected data using similar stimuli (42 participants)
- In this case, focus antecedence and accessibility are correlated
- Once again, we manipulated repetition

Experiment 2: Stimuli

Repetitions	Shift	No shift
2	Move the piano above the bed . Now, move the house above the bed . Now, move the bed above the pineapple.	Move the bed above the flag. Now, move the bed above the house. Now, move the bed above the pineapple.
1	Move the piano above the flag. Now, move the house above the bed . Now, move the bed above the pineapple.	Move the piano above the flag. Now, move the bed above the house. Now, move the bed above the pineapple.
CONTROL:	Move the piano above the flag. Now, move the house above the bell. Now, move the bed above the pineapple.	

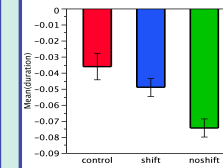
Predictions:

Condition:	Shift	No Shift
Accessibility	Not reduced	Reduced
Focus Antecedence	Not reduced	Reduced

Results Experiment 2

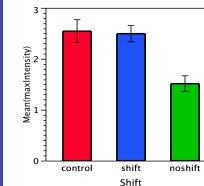
NORMALIZED LOG DURATION

- Word 2 in **Shift** condition is significantly smaller than control, but approached significance ($t=-2.04$, $p<0.05$)
- This could be due to repetition or accessibility
- Word 2 in **No Shift** condition significantly smaller than control ($t=-6.16$, $p<0.0001$)



NORMALIZED MAXIMUM INTENSITY

- Word 2 in **Shift** condition **not** significantly smaller than control ($t=-0.37$, $p<0.71$)
- Word 2 in **No Shift** condition significantly smaller than control ($t=-4.54$, $p<0.0001$)



Conclusion

FOCUS ANTECEDENCE AND THEMATIC ACCESSIBILITY

➤ The results show evidence for the effect of focus antecedence:

➤ Focus antecedent needed to license focus

➤ The results fail to show evidence for the theory of thematic accessibility:

➤ Thematic roles did not affect focus antecedence

THE ROLE OF REPETITION

➤ Number of repetitions did not reach significance in these experiments, except: In experiment 1, word 2 ("pineapple") was shorter in duration when word 4 was shifted and repeated twice than if it was shifted and repeated once