

## Introduction

> In English, constituents that can be inferred from an antecedent in which they do not overtly appear can be prosodically de-emphasized [1, 2]:

(1) She thought I played the viola, but I don't even *like* string instruments.

> Different mechanisms have been proposed for determining when de-emphasis of non-antecedent-contained material is licensed:

- Presence of a semantic antecedent in the discourse [3]
- Entailed (modulo  $\exists$ -closure) by an antecedent constituent [1, 4, 5]
- Identical antecedent accommodated in response to infelicitous deaccenting [6]

> Reported judgments of de-emphasized inferable constituents are largely introspective and impressionistic

> **Research goal:** Systematic empirical investigation of the licensing of prosodic de-emphasis by inferencing relations compared to by overt repetition

> Two types of inference investigated:

- **Entailment:** e.g. *x Verb1 y* entails *y Verb2*

(2) First John told Mary about the budget cuts, and then Sue heard about them. [2]

- **Implicational bridging:** *x Verb1 y* makes *x Verb2 y* pragmatically available

(3) She called him a Republican, and then he insulted her. [2, 7]

### Research questions

- 1) In production, do speakers produce discourse-inferable verbs with less prominence than discourse-new verbs?
- 2) In perception, do speakers judge de-emphasized discourse-inferable verbs as more felicitous than de-emphasized discourse-new verbs?
- 3) Are judgments of deaccented inferable verbs affected by a discourse context suggesting pragmatic identity between the verb and a possible antecedent?

## Stimuli & Norming

- > Two-clause sentences of the form *SVO and SVO*
- > Second clause constant by item
- > Constant number of syllables before Clause 2 onset across all items
- > Clause 2 subject always discourse-new; Clause 2 object same as Clause 1
- > Clause 1 verb varies to condition discourse status of Clause 2 verb:

	Verb status	Sentence
Items 1-6	New	Andrea <b>rebuffed</b> Laura, and Ron <b>embraced</b> Laura.
	Entailment	Veronica <b>hugged</b> Laura, and Ron <b>embraced</b> Laura.
	Repeated	Christina <b>embraced</b> Laura, and Ron <b>embraced</b> Laura.
Items 7-12	New	Madeline <b>offended</b> Noah, and Al <b>seduced</b> Noah.
	Implicational bridging	Angelina <b>charmed</b> Noah, and Al <b>seduced</b> Noah.
	Repeated	Jocelyn <b>seduced</b> Noah, and Al <b>seduced</b> Noah.

### Norming inferability

Given that you know that **Andrea rebuffed Laura**, how likely do you think it is that **Andrea embraced Laura**?

Least likely 1 2 3 4 5 6 7 Most likely

Verb status	Mean score
New (Items 1-6)	1.8 / 7
Entailment	6.7 / 7
New (Items 7-12)	2.1 / 7
Implicational bridging	5.5 / 7

> 60 Amazon Mechanical Turk users

## Experiments 1a & 1b: Production

### Questions

> Do speakers produce inferable verbs with phonetic correlates similar to discourse-new verbs or discourse-old verbs? Do phonological judgments match this pattern?

### Task - 1a (phonetic correlates)

- > Participants read aloud 72 critical sentences embedded in carrier paragraph
- > Instructed to read full paragraph and plan production ahead of time

### Participants - 1a (phonetic correlates)

> 10 participants (5 female, mean age 21.9) recruited from campus community

### Task - 1b (phonological judgments)

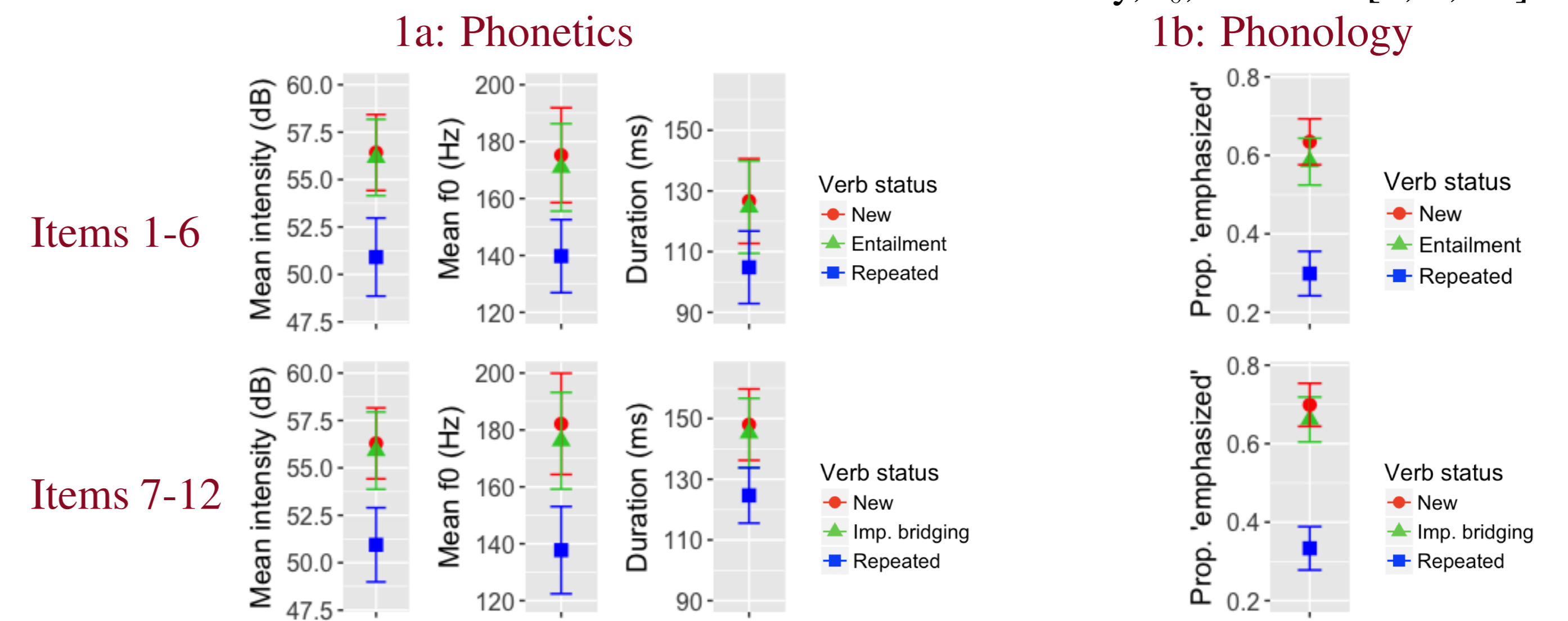
> Participants listened to 24 clipped recordings of Experiment 1a second SVO clauses and rated verb as "emphasized" or "not emphasized"

### Participants - 1b (phonological judgments)

> 200 self-reported native English-speaking Amazon Mechanical Turk users (62 female, mean age 34.3)

## Results

> Correlates measured for nucleus of Clause 2 verb: intensity,  $f_0$ , duration [8, 9, 10]



Error bars: 95% CI

### Analysis

- > All measures: significant effect of verb relation (LMER / Logistic MER;  $p$ 's < .05)
- > Measures lower for repeated verbs than new or inferable (EMM;  $p$ 's < .001)
- > Measures for new and inferable not significantly different (EMM,  $p$ 's > .2)
- > Inferable verbs pronounced like discourse-new to the exclusion of repeated verbs

## Experiments 2a & 2b: Perception

### Questions

- > Are deaccented inferable verbs perceived as felicitous even though they appear not to occur in (laboratory) production?
- > Does a discourse context that supports pragmatic identity for the verbs improve the acceptability of deaccented inferable verbs?

### Task

- > 2 reliable Experiment 1a participants (1 male, 1 female) returned and recorded an expanded stimulus set (18 entailment items, 18 implicational bridging items)
- > Productions of **new** verbs were labeled as *accented*; productions of **repeated** verbs were labeled as *deaccented*
- > Clause 1 and Clause 2 recordings were cross-spliced so accented and deaccented verbs appeared in each of 3 conditioning environments: **new**, **inferable**, **repeated**
- > For 36 sentences, MTurk participants rated prosody ("tune or melody of sentence") on a 7-point Likert scale, where 1 was least natural
- > 2a: Recordings rated out of the blue. 2b: Recordings preceded by written context potentially linking antecedent and inferable verb:

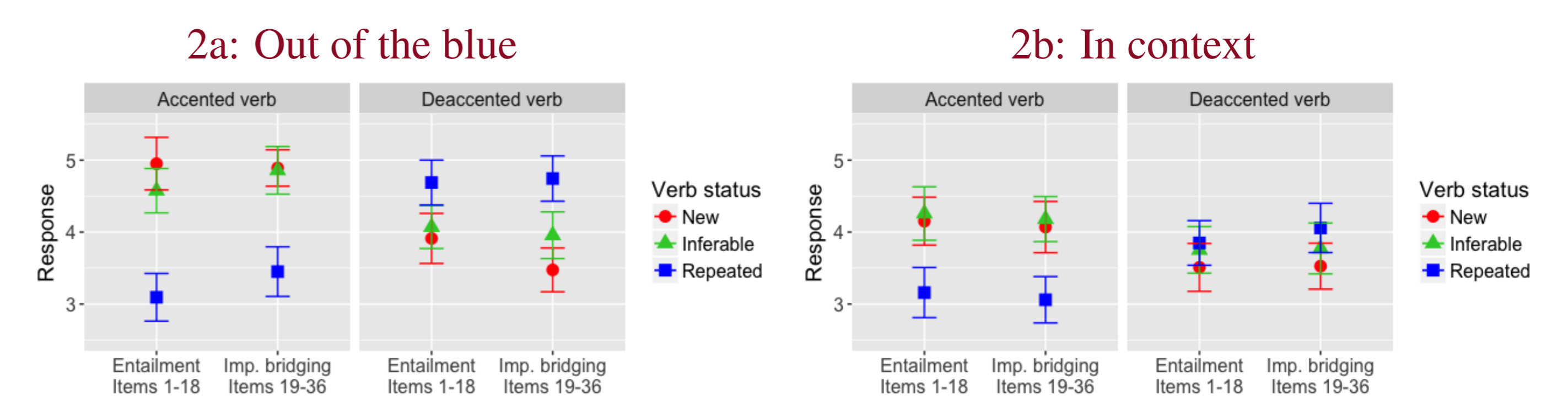
*The high school reunion was very successful, with many people seeing each other for the first time in ten years.*

Veronica **hugged** Laura, and Ron **embraced** Laura.

### Participants

> 144 self-reported native English-speaking Amazon Mechanical Turk users (2a: 67 female, mean age 36.7; 2b: 53 female, mean age 33.5)

### Results



Error bars: 95% CI

### Selected analysis

- > 2a, deaccented: repeated > inferable ( $p$ 's < .05); new / inferable n.s. ( $p$ 's > .8)
- > 2b, deaccented: repeated / inferable n.s. ( $p$ 's > .1); new / inferable n.s. ( $p$ 's > .8)
- > Out of the blue, inferable verbs pattern with new rather than repeated
- > In context, ratings for inferable verbs no longer different from ratings for repeated verbs (but, overall score range is compressed)

## Conclusion

- > Inferable verbs were not deaccented in production. (Experiments 1a & 1b)
- > Out of the blue, deaccented inferable verbs were less felicitous than deaccented repeated verbs. (Experiment 2a)
- > In supportive contexts, deaccented inferable verbs were not rated differently from deaccented repeated verbs. (Experiment 2b, but note compressed score range)
- > Relative unacceptability of deaccented inferable constituents suggests licensing under nonidentity driven by **accommodation** rather than **semantic antecedence** or **entailment**.
- > But, additional contextual support beyond lexical relations is required to license accommodation, i.e., Fox's [6] **accommodation-seeking material** was not sufficient.

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**Selected references:** [1] Büring (2016). Intonation and Meaning. Oxford UP. [2] Rooth (1992). Ellipsis identity and redundancy identity. *Stuttgart Ellipsis Workshop*. [3] Rochement (1986). *Focus in Generative Grammar*. John Benjamins. [4] Selkirk (1995). *Sentence prosody*. In Goldsmith, J., ed., *Hdbk. of Phon. Theory*. Cambridge UP. [5] Schwarzschild (1999). Givenness, AVOIDF, and other constraints on the placement of accent. *Nat. Lang. Sem.* 7(2). [6] Fox (1999). Focus, parallelism, and accommodation. *SALT 9*. [7] Tancredi (1992). Deletion, deaccenting, and presupposition. MIT PhD thesis. [8] Sluijter & van Heuven (1996). Acoustic correlates of linguistic stress and accent in Dutch and American English. *ICSLP 4*. [9] Campbell & Beckman (1997). Stress, prominence, and spectral tilt. *ESCA Workshop*. [10] Turk & White (1999). Structural influences on accentual lengthening in English. *Phonetics* 27(2).