Inferable constituents are not deaccented: Phonetic and perceptual evidence

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Introduction: Any theory of emphasis in English must grapple with the close connection between a constituent's accent status and its discourse availability [1-5]. One proposal holds that a constituent can be deaccented if it has been instantiated in a structurally isomorphic position in the prior discourse context. "Instantiation" has been proposed to include not only those constituents overtly used in the antecedent, but also those that can be inferred from it via entailment-like or bridging inferences [2-5]. While the claim that inferable constituents can be deaccented is common in the literature, only introspective judgments have been reported, and there has not been a rigorous empirical investigation of the felicitousness of deaccented inferable constituents. We used production and perception experiments to investigate the licensing of deaccenting for new, inferable, and repeated constituents. While repeated constituents were reliably deaccented as expected, there was no evidence that inferable constituents were pronounced with different emphasis from discourse-new constituents, undermining the claim that discourse relations like entailment or bridging license deaccenting.

In **Experiment 1**, 10 native English speakers (5 female, mean age 21.9) read 36 sentences of the form *SVO and SVO* embedded in a carrier paragraph. In the *SVO and SVO* sentence, the number of syllables prior to the onset of the second subject was held constant. The second subject was always a discourse-new, one-syllable proper name, the second verb was always an iamb, and the second object was always a trochee that was identical to the first object. Experimental items were constructed in 3 conditions; the second clause did not change by condition, but the first verb varied so the second verb could be completely new to the discourse (*Unrelated*), inferable from the first clause (*Related*), or identical to the first verb (*Repeated*). In 6 of 12 experimental items, the relation in the Related condition was entailment-like (*hugged-embraced*), while in the other 6, the second verb was made available by a possible bridging inference (*charmed-seduced*; Table 1). We use "entailment" to mean that *x Verb1 y* entails *x Verb2 y*, while "bridging" means that the verbs are semantically related and can be construed as denoting comparable events (e.g., by accommodation). Verb pairs were normed for the strength of the inference relation in a separate study. The analysis focused on three phonetic correlates of emphasis in English [6-8]. For the stressed nucleus of each second-clause verb, mean f_0, mean intensity, and duration were extracted, and relative values of mean f_0, mean intensity, and duration were also calculated as a ratio to the corresponding values for the second-clause subject nucleus (Figure 1). Linear mixed effect regression analysis for each phonetic variable revealed a significant effect of the second verb's discourse status on its phonetic realization (all p's$<.05$). Paired comparisons showed that the phonetic values for Repeated verbs were significantly lower than those for Unrelated verbs (p's$<.001$) and for Related verbs (p's$<.001$), while the values for Unrelated and Related verbs were not significantly different (p's$>.2$). The only exception was for relative duration among entailment items, where the difference between Related and Repeated verbs was not significant ($p>.1$). These findings suggest that Repeated verbs were reliably deaccented, while Unrelated and Related verbs were not, calling into question the claim that deaccenting is licensed by inferencing relations like entailment and bridging.

Experiment 2 investigated the possibility that the phonetic cues studied in Experiment 1 are an inadequate description of the emphasis status of the critical verbs by soliciting naïve judgments of the accent status of the recorded verbs removed from their conditioning context. 200 self-reported native English speakers (62 female, mean age 34.3) recruited on Amazon Mechanical Turk listened to the recorded second *SVO* clauses from Experiment 1 in isolation and rated the verb as "emphasized" or "not emphasized". The proportions of "emphasized" responses by condition are shown in Figure 2. Logistic mixed effect regression analysis showed a significant effect of the verb's discourse status ($p<.001$). The proportion of "emphasized" responses was significantly different for Repeated and Unrelated ($p<.001$) and Repeated and Related ($p<.001$), but not Unrelated and Related verbs ($p>.2$), confirming that Related verbs were not deaccented.

Conclusion: The results undermine the claim that inferable constituents can be deaccented, and set the stage for perception research investigating whether naïve listeners judge deaccented inferable constituents to be felicitous.

Verb relation	*Sentence*	*Mean verb relatedness score*
Unrelated	Elijah *rebuffed* Laura, and **Ron *embraced* Laura**.	1.8 / 7
Related (Entailment)	Veronica *hugged* Laura, and **Ron *embraced* Laura**.	6.7 /7
Repeated	Christina *embraced* Laura, and **Ron *embraced* Laura**.	N/A
Unrelated	Madeline offended Noah, and **Al *seduced* Noah**.	2.1 / 7
Related (Bridging)	Angelina *charmed* Noah, and **Al *seduced* Noah**.	5.5 / 7
Repeated	Jocelyn *seduced* Noah, and **Al *seduced* Noah**.	N/A

Table 1: Sample stimuli for Experiment 1

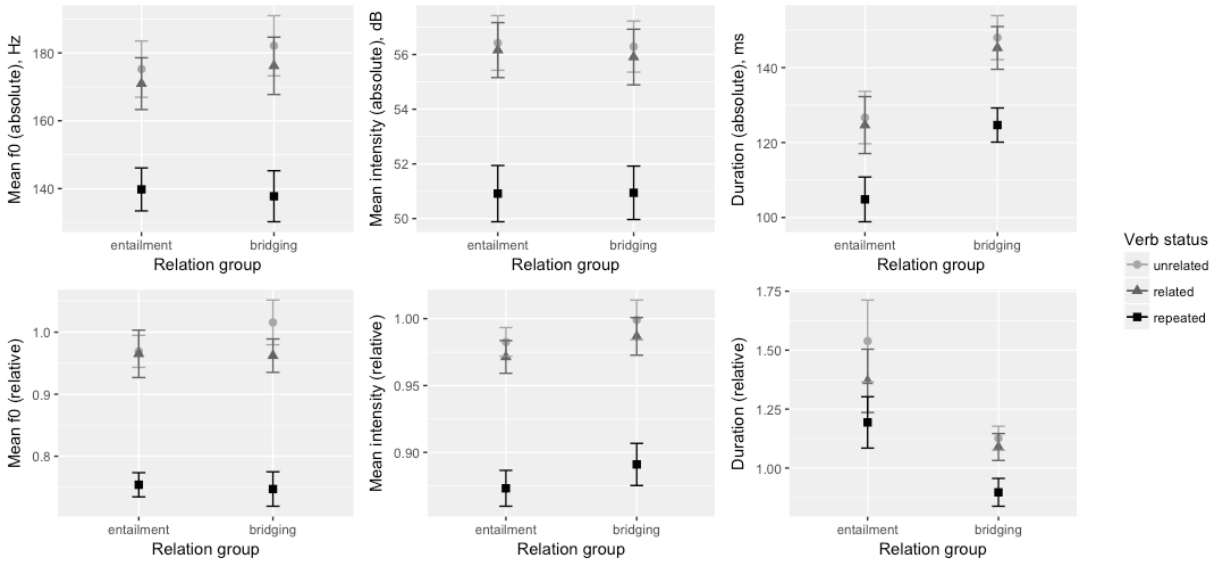

Figure 1: Phonetic measures by verb relation type and condition for Experiment 1. Top row, left to right: absolute mean f_0, absolute mean intensity, absolute duration. Bottom row, left to right: relative mean f_0, relative mean intensity, relative duration. Error bars: Standard error.

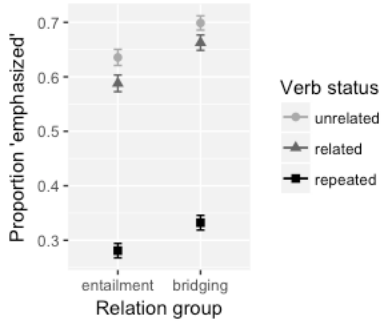

Figure 2: Proportion of "emphasized" responses by condition for Experiment 2. Error bars: standard error.

References: [1] Selkirk (1984), *Phonology and Syntax*. [2] Rooth (1992), *Stuttgart Ellipsis Workshop*. [3] Tancredi (1992), *Deletion, Deaccenting and Presupposition*. [4] Schwarzschild (1999), *Natural Language Semantics* 7(2). [5] Wagner (2012), *Contrasts and Positions in Information Structure*. [6] Sluijter & van Heuven (1996), *ICSLP 96*. [7] Campbell & Beckman (1997), *ESCA Workshop*. [8] Turk & White (1999), *Jour. of Phonetics* 27(2).