Effects of Pitch Accents on Memory in Language Comprehension

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The present study investigates whether prosodic stress affects memory in language comprehension. In speech, prosodic stress frequently indicates linguistic focus (see Ladd, 1996). Prior work using other manipulations of focus has suggested that elements receiving focus are encoded and represented with greater semantic specificity (e.g., Birch & Garnsey, 1995; Kamas et al., 1996; Sanford et al., 2006). However, most of these experiments investigated only reading and none examined subsequent memory; thus, the present study examined effects of focus on memory in spoken language and at a delay.

We manipulated the location of contrastive stress (or L+H* in ToBI) in recorded stories containing two contrast sets. For instance, the context passage below suggests two contrasts: one between the reporter and photographer, and one between the fire and robbery. The continuations in (1a) and (1b) refer to one member of each of the two sets. In the critical conditions, one of the referents was produced with contrastive stress and the other was produced with presentational stress (H* in ToBI). Filler stories, like (1c), also contained two contrast sets but were produced with only presentational stress. (Capitalization indicates contrastive stress.)

(Context) The newspaper didn't have the resources to cover both the fire and the robbery, so the editor assigned the paper's best reporter and photographer to focus on one of the two stories. This turned out to be a good decision, because...
(1a) ...the REPORTER'S work on the fire story was later nominated for an award.
(1b) ...the reporter's work on the FIRE story was later nominated for an award.
(1c–Filler) ...the reporter's work on the fire story was later nominated for an award.

Participants listened to 24 critical stories like (1a) and (1b) and 26 intermixed filler stories like (1c). After listening to all 50 stories, participants completed a two-alternative forced-choice recognition test for the two critical referents in each story. Within the critical stories, referents receiving contrastive stress were recognized significantly better than referents receiving presentational stress, $F_1(1,13) = 14.75$, $p < .01$; $F_2(1,23) = 26.83$, $p < .001$.

To examine the effects of contrastive stress relative to a baseline, post-hoc analyses compared memory for referents in the critical stories to memory for referents in the filler stories, which contained no contrastive stress. Referents receiving contrastive stress were recognized better than referents in the filler stories, $t_1(13) = -3.77$, $p < .01$, but recognition for critical referents receiving presentational stress was poorer than when neither referent received contrastive stress, $t_1(13) = 2.29$, $p < .05$. This implies that contrastive stress improved memory for the focused referent but impaired memory for the other referent. Supporting this interpretation, overall recognition did not significantly differ between filler and critical items, $t_1(13) = -0.45$, $p > .10$, suggesting that participants devoted the same resources to each story type but directed those resources differently within the stories.

These findings suggest that stress and linguistic focus play an attentional role in speech comprehension. Focus may direct attention to a particular piece of the linguistic input, facilitating encoding and recognition for that element but decreasing memory for other elements.

References

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