

Guiding Attention, Shaping Memory: Prosodic and Visual Highlighting in Immediate Recall

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Background: Recent studies [1, 2] have documented systematic differences in the extent to which readers recall different types of information immediately after reading a sentence (e.g., better recall of direct objects than temporal adjuncts). These differences can be interpreted as reflecting selective attention processes [1]. At the same time, highlighting information—both typographically and prosodically—has been shown to facilitate its processing [3, 4]. Moreover, prosodic prominence on a non-target word can impair processing and recall of target information [5]. The present study examines immediate recall of information conveyed by adjectives (Adj) and temporal adjuncts (Temp) in Czech, and how it is modulated by boldface highlighting in reading and prosodic prominence in listening. We examine not only the recall of highlighted vs. non-highlighted information, but also the effects of highlighting non-target information. We expected that (1) highlighted information would be recalled more accurately than non-highlighted information (Exp1-4); (2) highlighting non-target information would reduce recall accuracy for target information (Exp2, Exp4); (3) Temp would be recalled more accurately than Adj (Exp1-4).

Method: Two reading experiments were conducted (whole sentences were always displayed at once), followed by two listening experiments. Participants were presented with a sentence in one of its conditions (see Table 1) and then responded to an open-ended comprehension question. The independent variables were (a) highlighting (none, target, non-target), and (b) question type (Adj vs. Temp). This resulted in 2x2 within-participant design for Exp1 and Exp3 and 2x3 design for Exp2 and Exp4. All experiments used stimuli drawn from the same set of sentences (20 experimental items for Exp1, and 24 experimental items for Exp2-4), intermixed with 72 fillers.

Results: Fig. 1 shows differences in recall accuracy across conditions in Exp1-4 (Ns = 157, 191, 149, 180). The logit mixed-effects models showed higher recall accuracy for highlighted information compared to non-highlighted information, and higher recall accuracy for Temp compared to Adj in all experiments. In addition, Exp2 and Exp4 showed reduced recall accuracy for non-highlighted target information when non-target information was highlighted, but only for Temp.

Discussion: The results support all three hypotheses across both modalities. Highlighting target information enhances recall, consistent with deeper processing of salient elements. For Temp, reduced recall of target information when non-target information is highlighted provides evidence for attentional shift toward the highlighted element, resulting in diminished attention to non-highlighted information. The absence of this effect for Adj may be explained by the overall lower recall of adjectival information, suggesting that it already receives low attention even in sentences without any highlighting. As a result, attentional shifts induced by highlighting a different element are less likely to produce additional measureable effect.

References

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Figures and Tables

highlighting	sentence
none	Hana v prosinci na oblíbeném trhu dlouze vybírala drahý suvenýr.
target	Hana v prosinci na oblíbeném trhu dlouze vybírala drahý suvenýr.
non-target	Hana v prosinci na oblíbeném trhu dlouze vybírala drahý suvenýr.

Table 1: Item example for Exp2 and Exp4. Sentences have the same meaning and only differ in boldface highlighting, equivalent to prosodic prominence in listening. Gloss: Hana – in December – at favorite market – long – choose – expensive – souvenir.

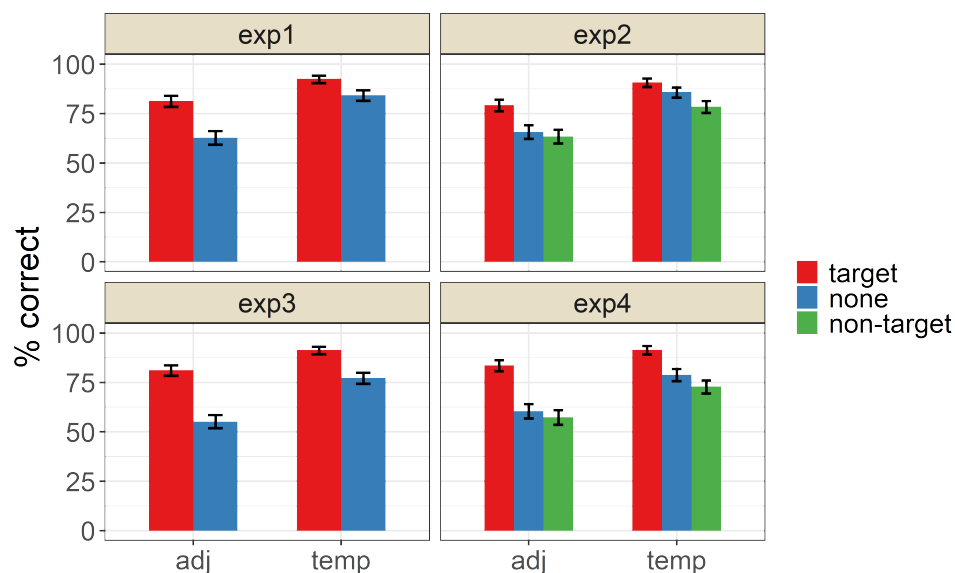


Figure 1: % of correct answers in Experiments 1-4. Adj = adjective as a target of the comprehension question; temp = temporal information as a target of the comprehension question. Target = targeted information highlighted with boldface/prosodic prominence; none = no information highlighted; non-target = non-targeted information highlighted. Exp1 and Exp2 were reading experiments, whereas Exp3 and Exp4 listening experiments.