Early and late selection: effects of load, dilution and salience

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The present issue focuses on the classic question of early vs. late selection and evaluates the current status of the perceptual load theory that has been offered as an intermediate solution. Several of the papers compare or contrast perceptual load with an alternative explanation- perceptual dilution. The first group of papers report evidence that is inconsistent with the perceptual load theory but is generally consistent with the dilution theory.

The review of Scalf et al. (2013) presents a hybrid neural competition theory that is generally consistent with both perceptual load and dilution theories. This theory reinforces the original view that low perceptual load is associated with a stronger impact of task-irrelevant information. As the authors point out, this might reflect different processing strategies in conditions with high and low perceptual load: While low perceptual load might allow for bottom-up-driven target selection, high perceptual load might call for top-down regulation. The latter leads to stronger filtering, which reduces the impact of task-irrelevant distractors.

The remaining papers use perceptual load theory as a direct or indirect context for studying other aspects of attentional selection. The role of working memory in regulating the degree to which distractors can be ignored is the focus of de Fockert’s (2013) review. In support of the original assumption, the review provides strong evidence that higher working memory load makes it more difficult to ignore task-irrelevant distractors. This fits with the idea that working memory has an active role in gating irrelevant information.

Forster (2013) takes the perceptual load theory a step forward into the realm of mind-wandering and thought distraction. In her review she carefully distinguishes between different types of task relevancy and between external and internal (e.g., task-unrelated thoughts) sources of distraction. She argues that perceptual load theory is a powerful and largely universal framework to study distraction effects.
Parks et al. (2013) used SSVEPs together with ERPS to study the effect of attentional load in a go-no task. The findings reveal a center-surround configuration of both facilitation and suppression in the visual field.

Swallow and Jiang (2013) bring in a novel perspective by relating findings on the impact of perceptual load to the attentional boost effect—the observation that distractor processing can benefit from temporal synchronicity with target presentation. As they point out, the seemingly automatic processing of distractors with high perceptual load might reflect a kind of “intentional automatization”: the cognitive system might be programmed to take in information automatically whenever being triggered by a target, suggesting that automatic processing might be a byproduct of intentional selection.

Folk (2013) makes an interesting conceptual distinction between processing costs produced by response-incompatible distractors on the one hand and search costs on the other. By combining aspects of the original perceptual-load paradigm and the classical singleton-search paradigm, he provides evidence that search costs remain even under conditions where the compatibility of distractors no longer affects processing.

Finally, Moher et al. (2013) tested selection processes without the explicit requirement of target identification. They found that detection performance remained high in spite of focal attention manipulations (i.e., target saliency, availability of cognitive resources, and familiarity) that eliminated identity-repetition effects. Thus, the authors conclude simple target detection is not dependent on focal attention.

We hope you will find this Research Topic interesting and informative. Enjoy your reading!

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