Introduction

Wheeler and Treisman (2002) assessed feature binding in visual working memory (VWM) with two change detection tasks:

- **Single Probe (SP):** proportion correct in the binding condition = shape only.
- **Whole Display (WD):** binding performance worse than shape only. Interpreted as binding specific WD interference due to processing demands at test.

However, proportion correct in SP task overestimates binding performance (Cowan et al., 2013). This is not the case for the WD.

Experiment 1

Compared SP and WD tasks for colour, shape, and colour-shape binding.

Replicated Wheeler & Treisman’s original pattern of proportion correct. We used processing models derived from the slots conception of VWM (see top right) to better compare tasks. All experiments N = 24, 72 trials per condition.

Experiment 2

In Exp 1 irrelevant features were presented at test in the colour/shape only conditions.

Perhaps this exaggerated the difference between features and binding?

Exp 2 removed irrelevant features in colour/shape only conditions. At test, colours presented in squares and shapes presented in black.

Experiment 3

Estimates of the number of items in VWM suggest overall WD interference and larger binding cost in the SP task.

Possible these findings are artefacts from applying different models.

Exp 3 attempted to match the two tasks directly.

Conclusions

The WD task does not cause binding specific interference, rather the SP task overestimates binding accuracy relative to colour/shape.

Exps 1 & 2 estimated the number of items in VWM using the slots model of VWM. Estimates were lower in the WD task and a disproportionate binding cost was found in the SP task. However, it is possible that this is an artefact of our modelling approach.

Exp 3 attempted to match the tasks directly and found equivalent patterns of performance when a single decision was made at test relative to multiple decisions. Thus any interference caused by multiple test items is minimal and not specific to VWM for feature bindings.