

# Inducing Garner Effects in Manual Size Estimation

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## BACKGROUND

Perception-Action Model (PAM)	Garner Interference in Perception & Action	Meta-analysis & Review
<p><b>Ventral stream</b> processes perception like <b>manual size estimation</b></p> <p><b>Dorsal stream</b> processes actions like <b>visually-guided grasping</b></p> <p>Visual input is assumed to be processed differently in dorsal and ventral streams (Goodale &amp; Milner (1992) [1])</p> <p><b>Garner Interference &amp; Facilitation</b></p> <p><b>WIDE or NARROW?</b></p> <p>Can length and width be separately processed? Can irrelevant (length) variation be ignored?</p> <p><math>RT_{corr} &lt; RT_{base} &lt; RT_{filt}</math></p> <p>Correlated Baseline Filtering</p> <p>Relevant Irrelevant Irrelevant</p> <p><b>Garner Interference = <math>RT_{filt} - RT_{base}</math></b> <b>Garner Facilitation = <math>RT_{base} - RT_{corr}</math></b></p> <p>Garner &amp; Felfoldy (1970) [2]</p>	<p><b>Perception = holistic</b> processing – cannot ignore irrelevant information – Garner interference <b>present</b> <b>Perception task = Closed-loop manual size estimation</b></p> <p><b>Action = analytical</b> processing – can ignore irrelevant information – Garner interference <b>absent</b> but visual feedback may further prevent Garner interference <b>Action task =</b></p> <ul style="list-style-type: none"><li>- Closed-loop grasping: full vision during movement</li><li>- Open-loop grasping: no vision after movement onset</li></ul> <p><b>Garner interference present in perception but not action</b> ⇒ Different processing in <b>ventral vs. dorsal</b></p> <p><b>No influence of visual feedback on Garner interference</b></p> <p>Ganel &amp; Goodale (2003) [3]</p>	<p>Meta-analysis of Garner interference revealed little evidence for differences in perception and action [4] (N = number of studies)</p> <p>Garner Interference Reaction Time [ms]</p> <p>◆ Closed-Loop ■ Open-Loop</p> <p>Classic Grasping ManEst</p> <p>Open-loop conditions may favour Garner interference in reaction time (time until movement onset) because participants do not have visual feedback after movement onset [5] but only one study investigated open-loop manual estimation [6]</p> <p>Presence of <b>Garner facilitation</b> in manual estimation may provide further evidence for perception-action differences but this has not been investigated yet</p> <p>Bhatia et al. (2024) [4], Hesse &amp; Schenk (2013) [5], Schum et al. (2012) [6]</p>

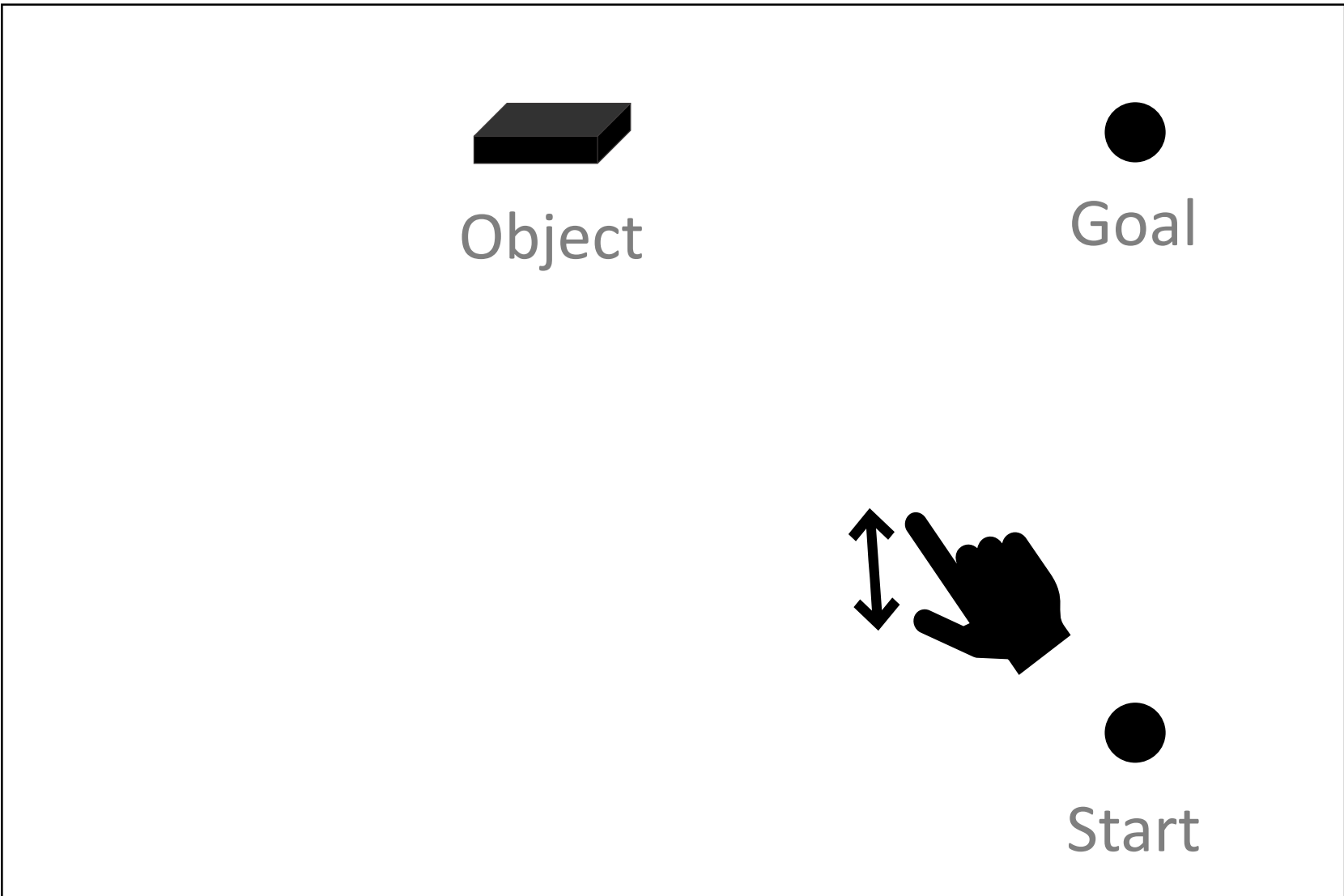
## SET-UP & DESIGN

Our review suggests that there is insufficient evidence for perception-action differences regarding Garner effects. The aim is to design an experiment where the occurrence of Garner effects (interference and facilitation) in a **manual estimation** task would be highly likely.

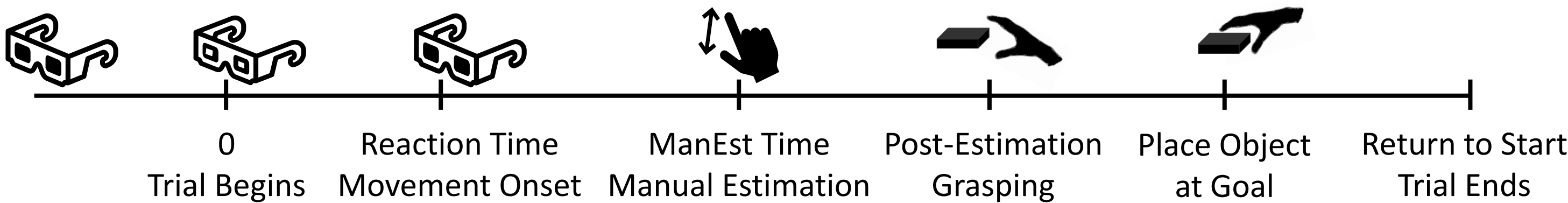
Participants performed an **open-loop manual estimation task** (increased likelihood of Garner interference [5]). At the beginning of each trial, participants viewed the target object but when their hand began to move, visual feedback was no longer available.

Planned  
n = 30

Trials  
k = 128



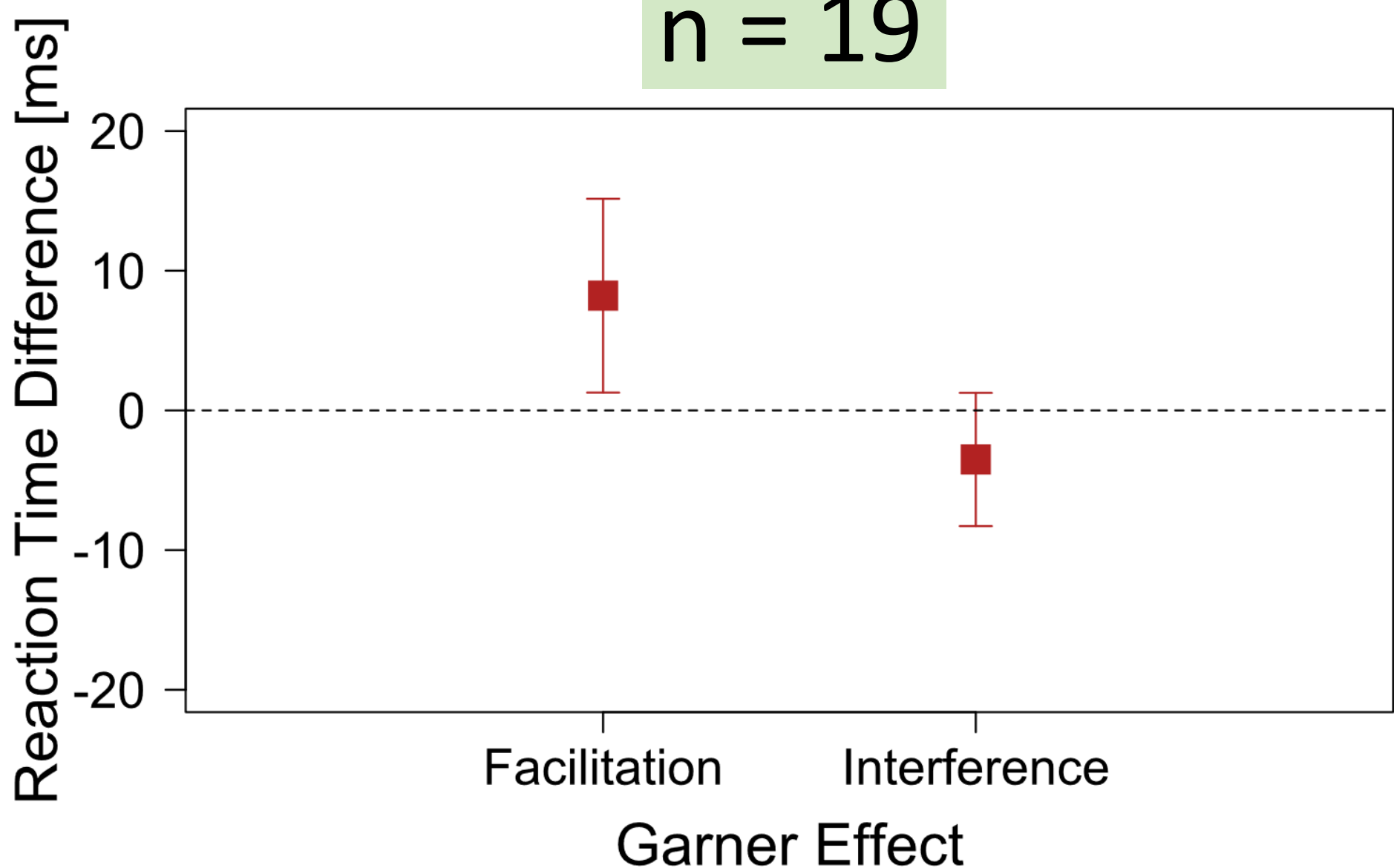
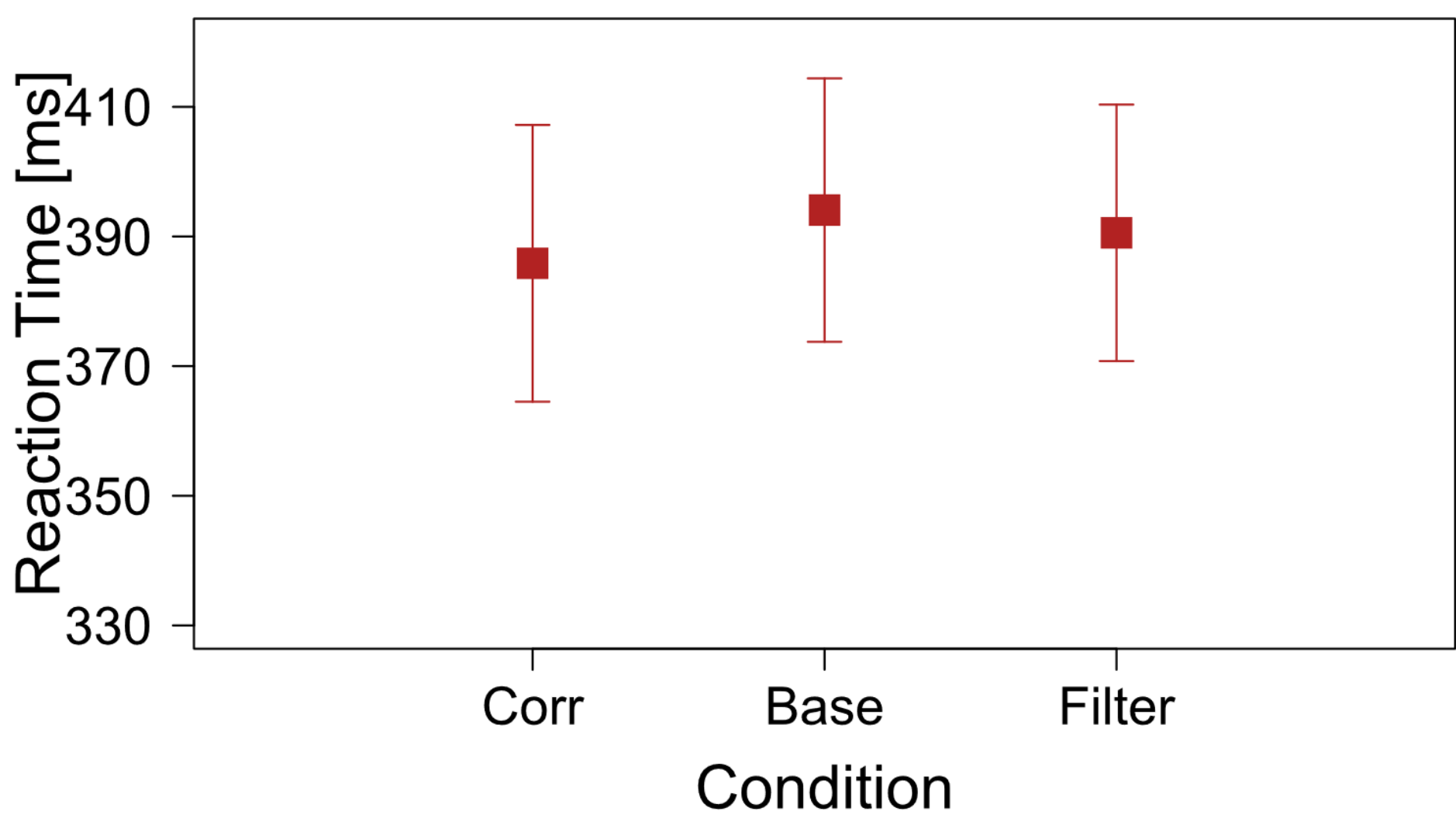
Dependent Variable:  
Reaction Time



Further, Garner facilitation should occur in **manual estimation** because **holistic** processing is assumed. Three Garner conditions were tested: baseline, filtering and correlated. Longer reaction times in baseline compared to correlated would result in Garner facilitation effects.

Hesse & Schenk (2013) [5]

## PRELIMINARY RESULTS



Preliminary results indicate no evidence for Garner effects in open-loop manual estimation

Lack of power: may need many more participants to reliably detect effects

Small negative Garner interference effect: consistent with previous results [6]

Schum et al. (2012) [6]

## REFERENCES

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