

The role of stimulus-response translation automaticity in concurrent action execution and inhibition



INTRODUCTION

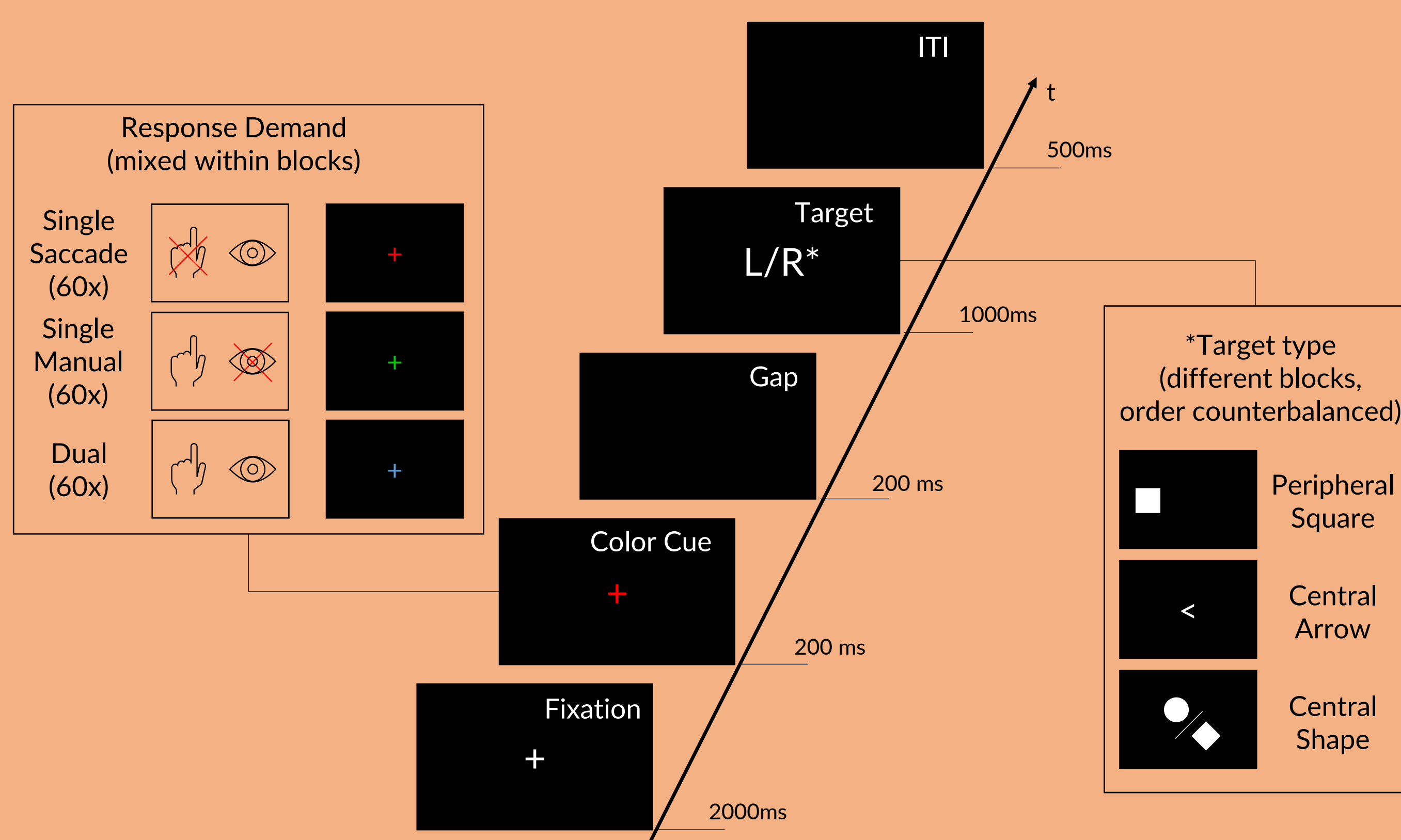
- Executing two actions at the same time (instead of one) is typically associated with performance costs (dual-action costs; e.g., Pashler, 1994)
- Sometimes, executing two actions can be easier when the execution of one action requires the simultaneous inhibition of another, prepotent action (dual action *benefits*; Huestegge & Koch, 2014; Kürten et al., 2022)
- Failures to inhibit a prepotent action under single-action requirement characterized by false-positive executions

→ the more inhibition failures, the greater the relative dual-action benefit

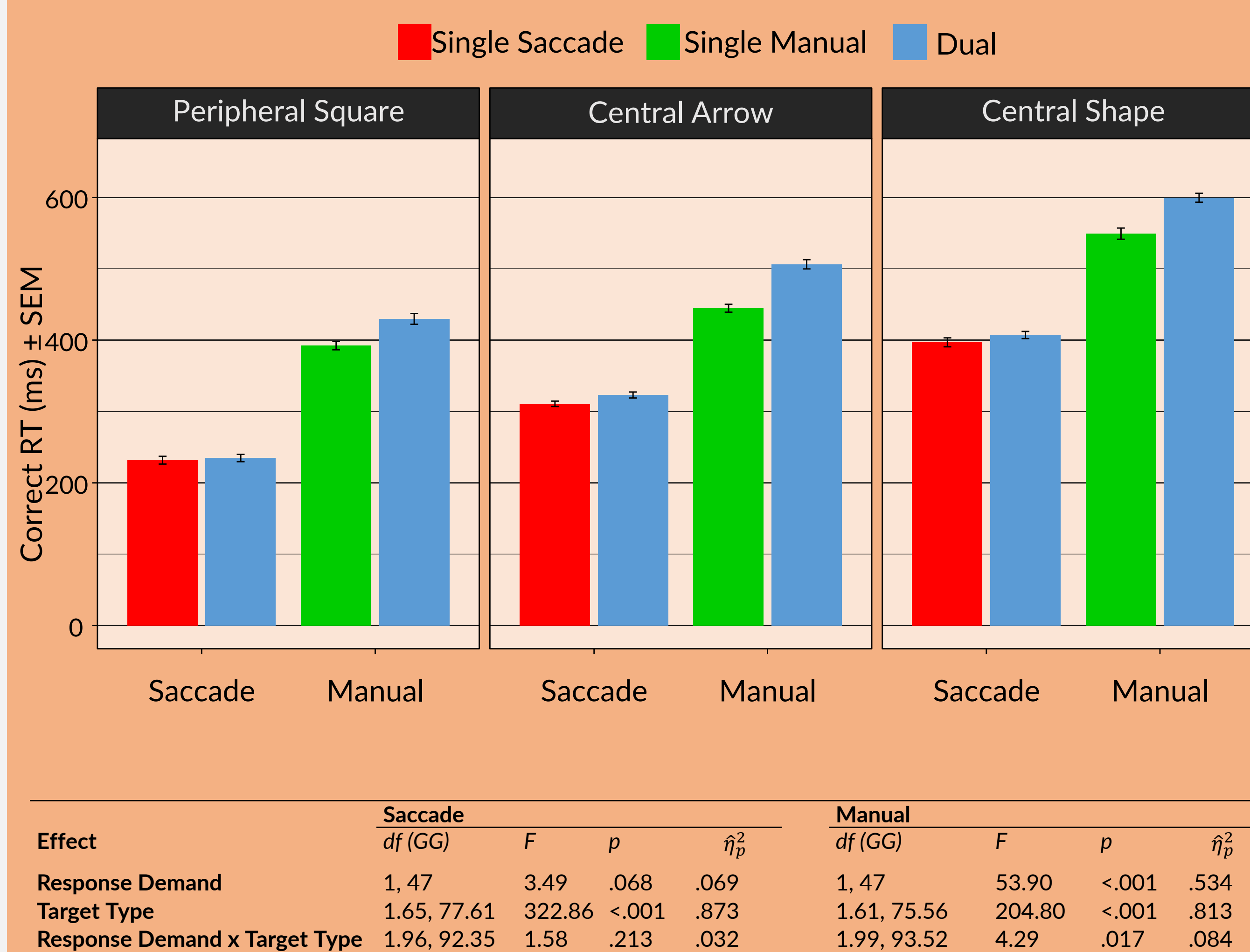
PRESENT STUDY

- Participants executed highly prepotent eye-movements (saccades) *and/or* manual button presses
 - Single peripheral visual target (cf., Fagot & Pashler, 1992)
 - Spatially compatible actions
 - Randomly switching (cue-based) single-action and dual-action requirements
- Manipulation of stimulus-response (S-R) translation automaticity via target type
 - Manipulation check via reaction times (RTs):
 - peripheral square < central arrow < arbitrary central shape
- If participants use S-R translation time to inhibit unwarranted response types (effector systems), false-positive (saccade) errors should decrease with S-R translation automaticity

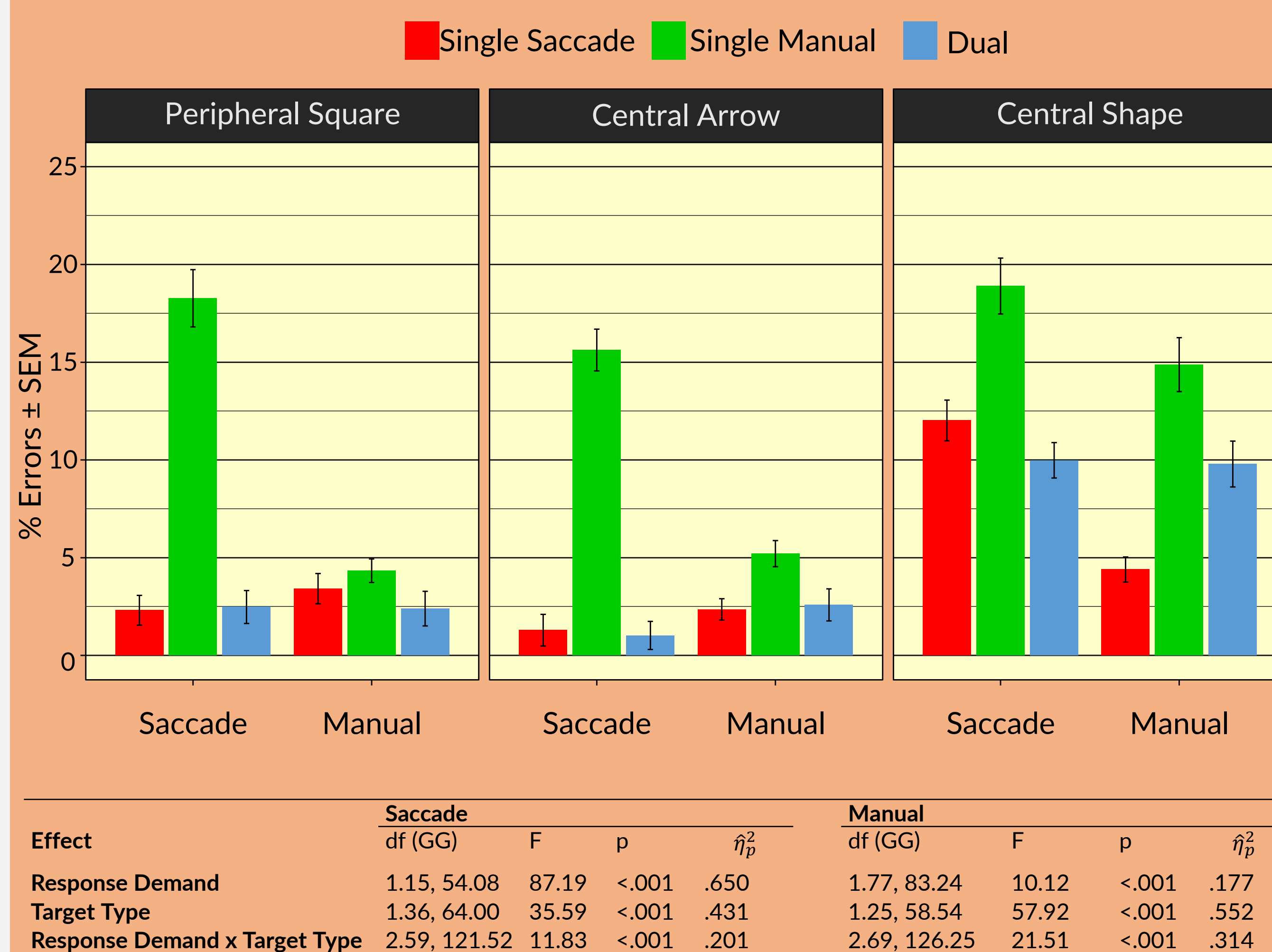
METHOD (Trial Structure)



RESULTS – RTs



RESULTS – Errors



SUMMARY & DISCUSSION

- RTs
 - Different levels of stimulus translation automaticity reflected in correct RT
 - Responses in both modalities took longer to specify with more abstract targets
- Errors
 - False-positive (saccade) errors most frequent in the central shape condition
 - However, overall highest error level
 - Relative dual-action benefit decreased with decreasing stimulus translation automaticity

CONCLUSION

- Better inhibitory control of a prepotent action when a concurrently to-be-executed action takes longer (vs. shorter) to be specified
- However, only when specification is not overly difficult

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