



BACKGROUND

The same basic action (e.g., key press) can be executed

- as a single action (i.e., on its own)
- as part of a dual action (e.g., key press + vocalization)

Present Study: How are basic dual actions mentally represented (cf. Hazeltine et al.. 2022)? [1]

- as a sum of their parts (i.e., compositionally; “A+B”) [2]
- as a distinct response (i.e., holistically; “C”) [3]

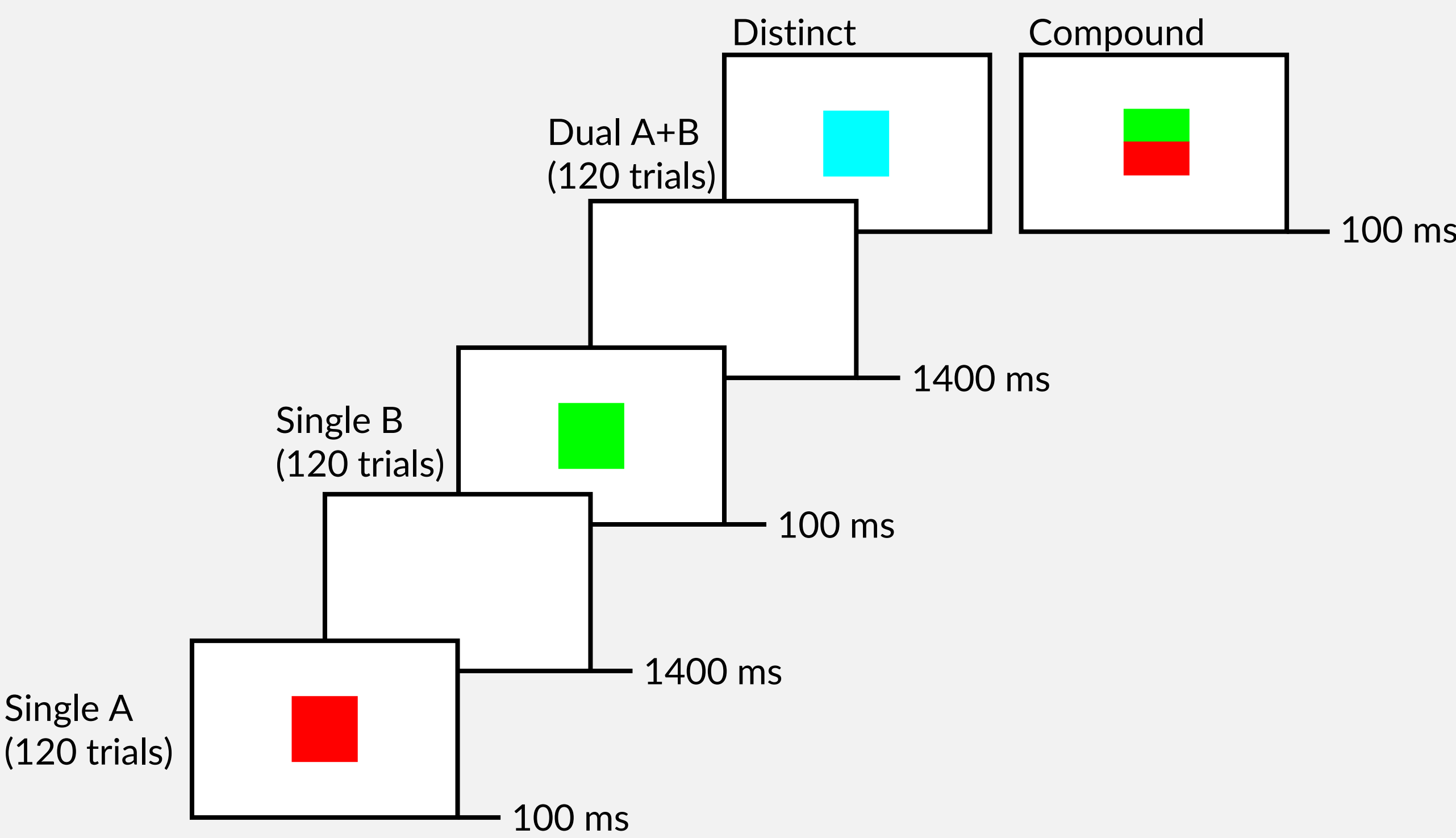
→ Analysis of transitional RTs when switching between one single action (A), another single (B), and a dual action (A+B) [4]

- compositional dual-action representation: partial repetition costs/benefits for dual-action (de)construction
- holistic dual-action representation: similar switch costs for dual-action (de)construction and single-action switching

- Manipulations:
 - intra-modal dual actions (Exp. 1) could promote holistic representations compared to cross-modal dual-actions (Exp. 2) [5]
 - distinct dual-action stimuli could promote holistic representations compared to compound dual-action stimuli

METHODS

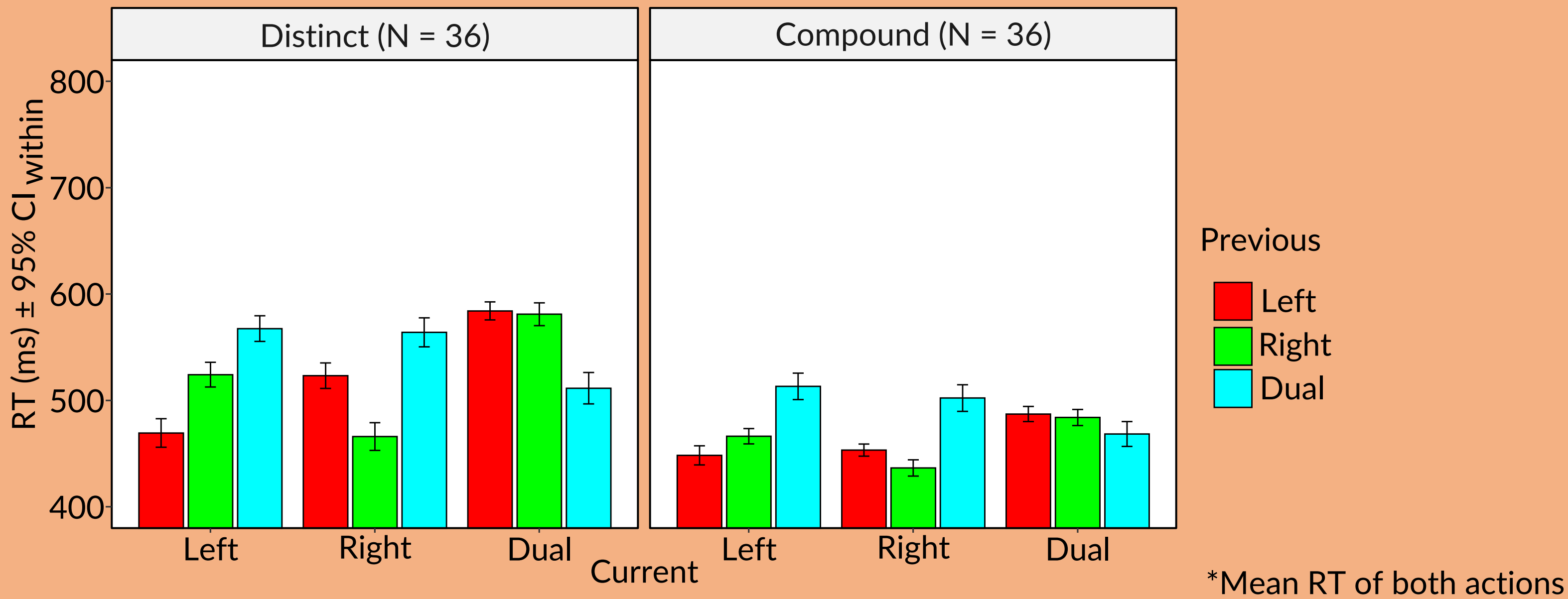
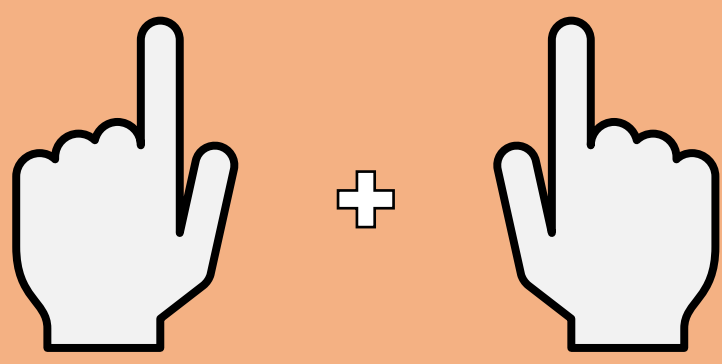
Trial Structure:



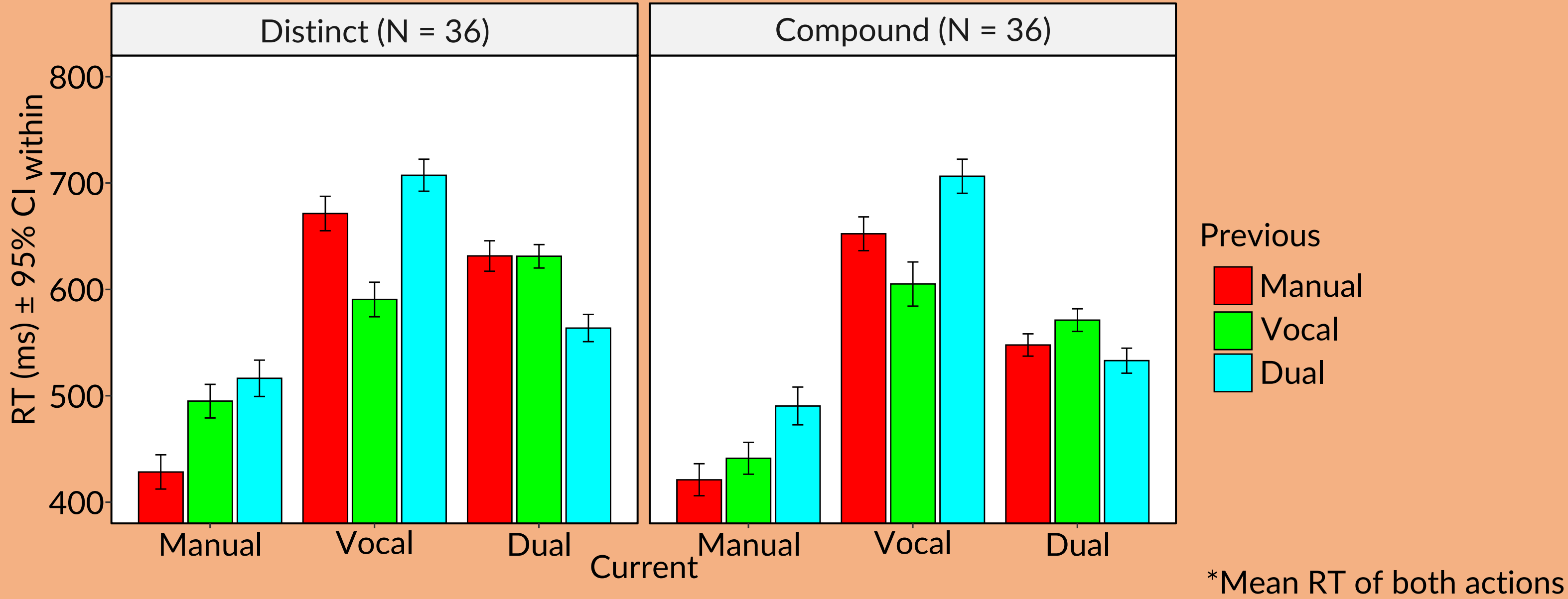
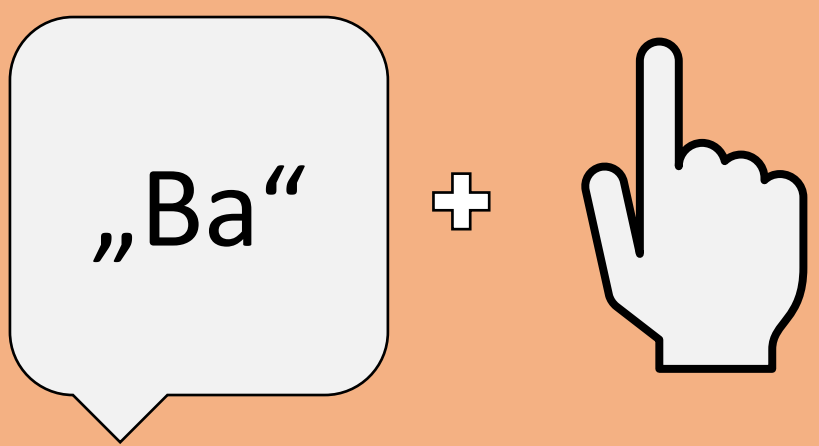
Dual actions can retain features of their constituting single actions!

RESULTS (RT)

Intra-modal dual actions (N = 72)



Cross-modal dual actions (N = 72)



DISCUSSION:

Dual actions can retain features of constituting single actions

- Construction of dual-actions
 - similar cost for transitions from either single action
- Deconstruction of dual-actions
 - switches from dual actions to single actions harder than switching from one to the other single action (partial repetition cost)

- Similar pattern of switch costs for
 - intra-modal and cross-modal dual actions
 - distinct and compound dual-action stimuli
- Similar mental representation across experimental settings (however, generally faster dual-actions with compound stimuli indicating more efficient composition?)
- Data collection ongoing: Adding a no-go condition for dual-action construction „from scratch“

ERROR DATA

Previous	Current	Distinct		Compound	
		ER (%)	95% CI	ER (%)	95% CI
Left	Left	2.83	0.74	2.11	0.67
Right	Left	4.6	1.12	3.25	0.84
Dual	Left	5.25	1.4	6.14	1.48
Left	Right	3.14	0.93	3.66	0.96
Right	Right	2.45	0.78	3.43	0.87
Dual	Right	3.91	0.97	6.03	1.42
Left	Dual	2.07	1.17	0.84	0.83
Right	Dual	1.91	0.94	0.76	0.65
Dual	Dual	0.91	0.75	0.53	0.68

Previous	Current	Distinct		Compound	
		ER (%)	95% CI	ER (%)	95% CI
Manual	Manual	0.89	0.79	0.83	0.63
Vocal	Manual	1.43	0.76	1.01	0.59
Dual	Manual	2.63	1.07	1.44	0.65
Manual	Vocal	6.44	1.51	4.86	1.18
Vocal	Vocal	2.15	0.86	2.05	0.79
Dual	Vocal	9.15	1.89	9.64	1.93
Manual	Dual	1.18	0.84	0.39	0.49
Vocal	Dual	0.91	0.76	0.71	0.62
Dual	Dual	0.35	0.53	0.56	0.58

REFERENCES

[1] Hazeltine, E., Dykstra, T., & Schumacher, E. (2022). What is a task and how do you know if you have one or more? In D. Gozli & J. Valsiner (Hrsg.), *Experimental Psychology* (S. 75–95). Springer International Publishing. https://doi.org/10.1007/978-3-031-17053-9_6

[2] Logan, G. D., & Gordon, R. D. (2001). Executive control of visual attention in dual-task situations. *Psychological Review*, 108(2), 393–434. <https://doi.org/10.1037/0033-295X.108.2.393>

[3] Huestegge, L., Pieczykolan, A., & Koch, I. (revised & resubmitted). A Gestalt account of human behavior is supported by evidence from switching between single and dual actions. *Scientific Reports*.

[4] Huestegge, L., & Strobach, T. (2021). Structuralist mental representation of dual-action demands: Evidence for compositional coding from dual tasks with low cross-task dimensional overlap. *Acta Psychologica*, 216, 103298. <https://doi.org/10.1016/j.actpsy.2021.103298>

[5] Weller, L., Pieczykolan, A., & Huestegge, L. (2022). Response modalities and the cognitive architecture underlying action control: Intra-modal trumps cross-modal action coordination. *Cognition*, 225, 105115. <https://doi.org/10.1016/j.cognition.2022.105115>