

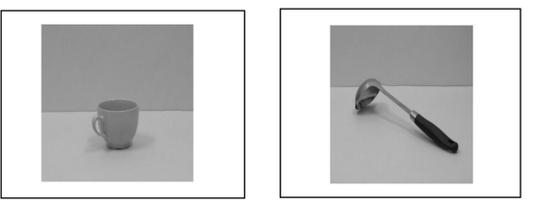
Background

- Reaction times (RTs) are faster when the hand used to respond is congruent with the orientation of a (viewed) object handle even if this congruency is irrelevant to task – this is known as the **affordance** effect.^[1-3]
- Developmental coordination disorder (DCD) is a neurodevelopmental disorder often associated with sensorimotor deficits (such as in tool use and object grasping).^[4]
- DCD, similarly to dyslexia, has been proposed to relate to deficits in dorsal ‘vision for action’ stream processing. On the other hand, ADHD has been associated to deficits in the ventral ‘vision for perception’ stream.^[4-6]
- Here we developed a novel online version of Tucker and Ellis’^[1] stimulus-response compatibility (SRC) paradigm to measure affordance perception in people with traits of DCD, dyslexia and ADHD.

Method

Experimental Task

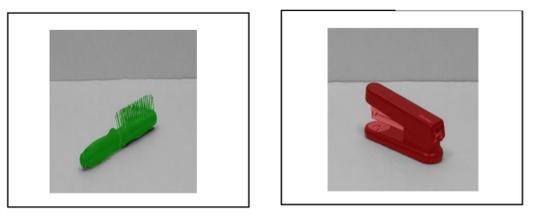
qualtrics^{XM}



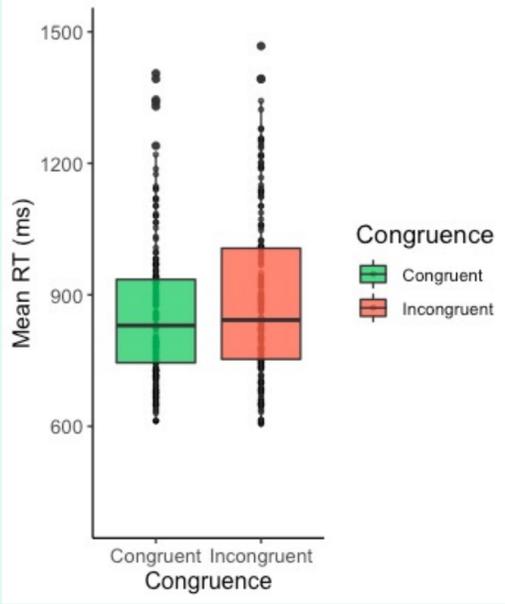
- **Experimental task:** upright/inverted judgements made by ‘p’ or ‘q’ keypresses.^[1]
- **Colour control task:** green or red judgements made by ‘p’ or ‘q’ keypresses.^[3]
- The hand used to correctly respond was **congruent** or **incongruent** with the handle in both tasks.
- Participants completed self-report questionnaires for DCD^[6], dyslexia^[7] and ADHD^[8]. Median splits used to define high/low trait groups.
- Final sample size $N = 178$ (out of 442)

Colour Control Task

qualtrics^{XM}



Experimental Task



Results

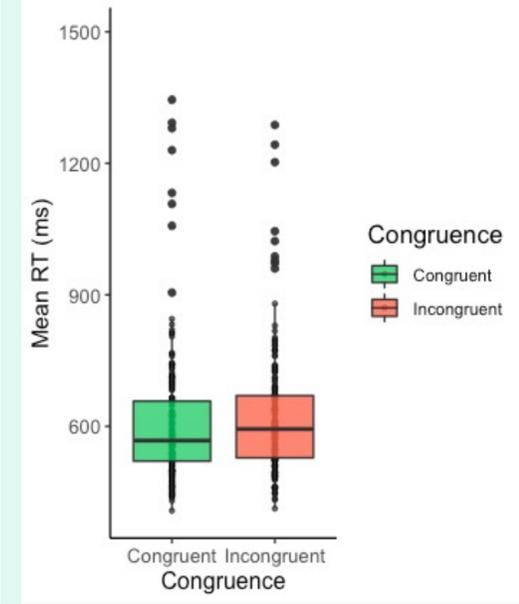
Experimental Task:

- A 2(Handle Orientation) x 2(Hand) ANOVA showed a significant interaction in line with the affordance effect.
- RTs for congruent condition were significantly faster than for incongruent condition (Mean difference = 29ms).

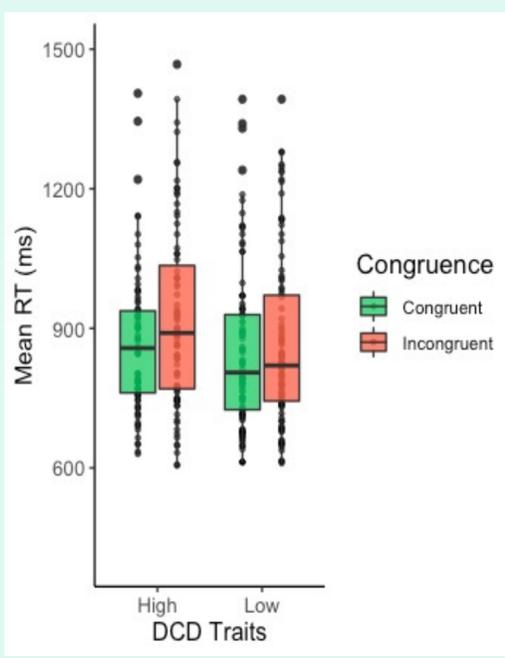
Colour Control Task:

- A 2(handle orientation)x2(hand) ANOVA showed no significant effects.
- RTs were similar between congruent and incongruent conditions (Mean difference = 14ms).

Colour Control Task



Experimental Task



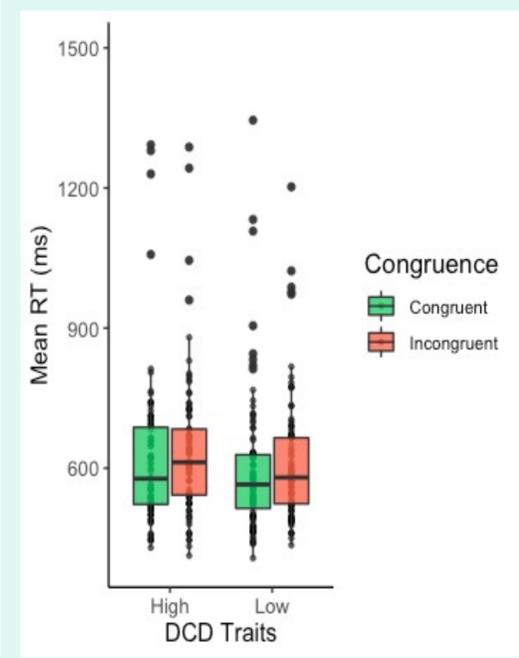
Experimental Task:

- A 2(Condition) x 3(Groups: DCD, Dyslexia, ADHD traits) ANOVA showed a significant interaction between condition and DCD.
- People with high traits of DCD had significantly faster RTs for congruent than incongruent trials (Mean difference 50ms).
- No condition effects were found for people with low traits of DCD (Mean difference 2ms).
- No interactions were found between condition and ADHD or dyslexia trait groups.

Colour Control Task:

- No effects

Colour Control Task



Discussion

- We successfully replicated the SRC paradigm online, showing affordance effects.
- Successful online SRC paradigm replication allows the possibility to distribute a standardised affordance measure for a range of clinical populations.
- Congruency effects were only found for the experimental and not the control colour task, supporting the affordances rather than spatial compatibility interpretation.^[3]
- Additionally, there is an increased affordance effect in people with high traits of DCD. Albeit non-significant, this seems to be driven by increased RTs in incongruent trials in people with high compared to low traits of DCD.
- This effect was not mirrored in ADHD or dyslexia, suggesting affordance effects may be sensitive to DCD.

Data excluded: Overall accuracy <90%^[1] Participant left handed
RTs > 2SD from condition mean Participant failed catch questions

References
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