

Investigating the relationship between self-referencing and visuospatial working memory: can ownership improve working memory?

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Investigating the relationship between self-referencing and children's visuospatial working memory: can ownership support working memory?

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Introduction

- The **self-reference effect is an attentional bias for information and objects related to the self.**
- It has been suggested that **the self may support working memory** (WM; D'Ailly, Simpson & MacKinnon, 1997). However, till date **this assumption remains untested.**
- WM is the ability to temporarily store and manipulate information, and is of limited capacity. Individual's **working memory capacity has often been identified as a predictor of educational attainment** (Alloway & Alloway, 2010) and as such is a key element to focus on and support during primary-school.
- The **current study directly measured the impact of self on visuospatial working memory** (VSWM) by adapting the Corsi-Block Tapping Task (CBTT). Self-cues were created using an ownership manipulation.

Method

Participants: 94 participants (45 female, 49 male) aged 7 to 9 years of age (M = 8.03, SD = .71).

Procedure; sorting task.

- Adapted version of Cunningham et al.'s (2013) ownership paradigm (see Figure 1).
- Objects were individually presented with a coloured cue indicating whether the item belonged to the child or the experimenter, and therefore which box to sort items into. This task was used to elicit self and other ownership.



Figure 1. Trial from sorting task

Working memory task: digital CBTT

- Participants were instructed to reproduce flashed sequences of up to 9 squares (see Figure 2). The test ended after three failed attempts.
- In the self trials, object pictures previously assigned to the child were flashed within the squares. In the other trials, the experimenter's items were presented and in the control, previously unseen items were used.

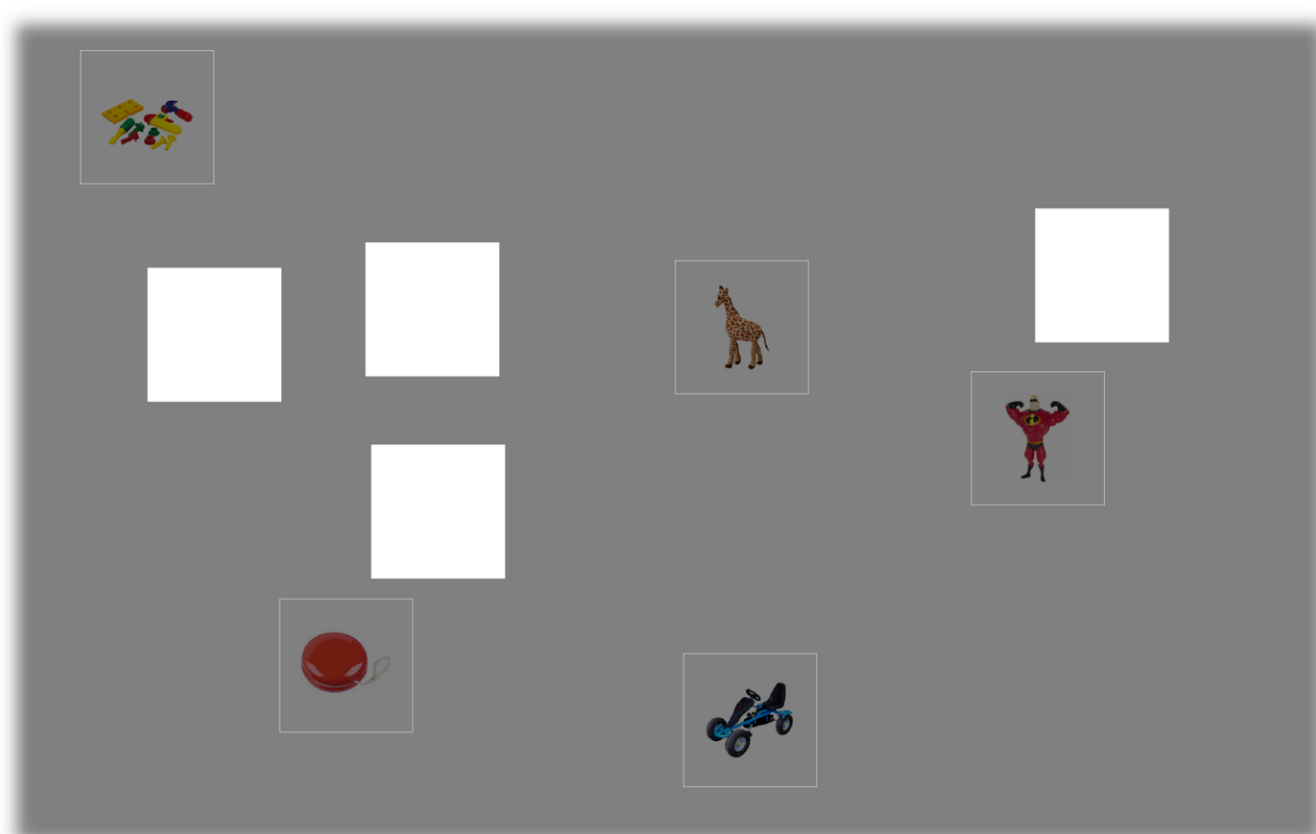


Figure 2. Example trial from the CBTT, in which a participant correctly reproduced a 5-block sequence

Results

Working memory span

- Working memory span (highest trial achieved) was analysed between control, self and other conditions.
- A repeated measures ANOVA revealed no significant difference in means (see Figure 3) $F(2, 186) = .293, p = .75, \eta^2 = .00$.

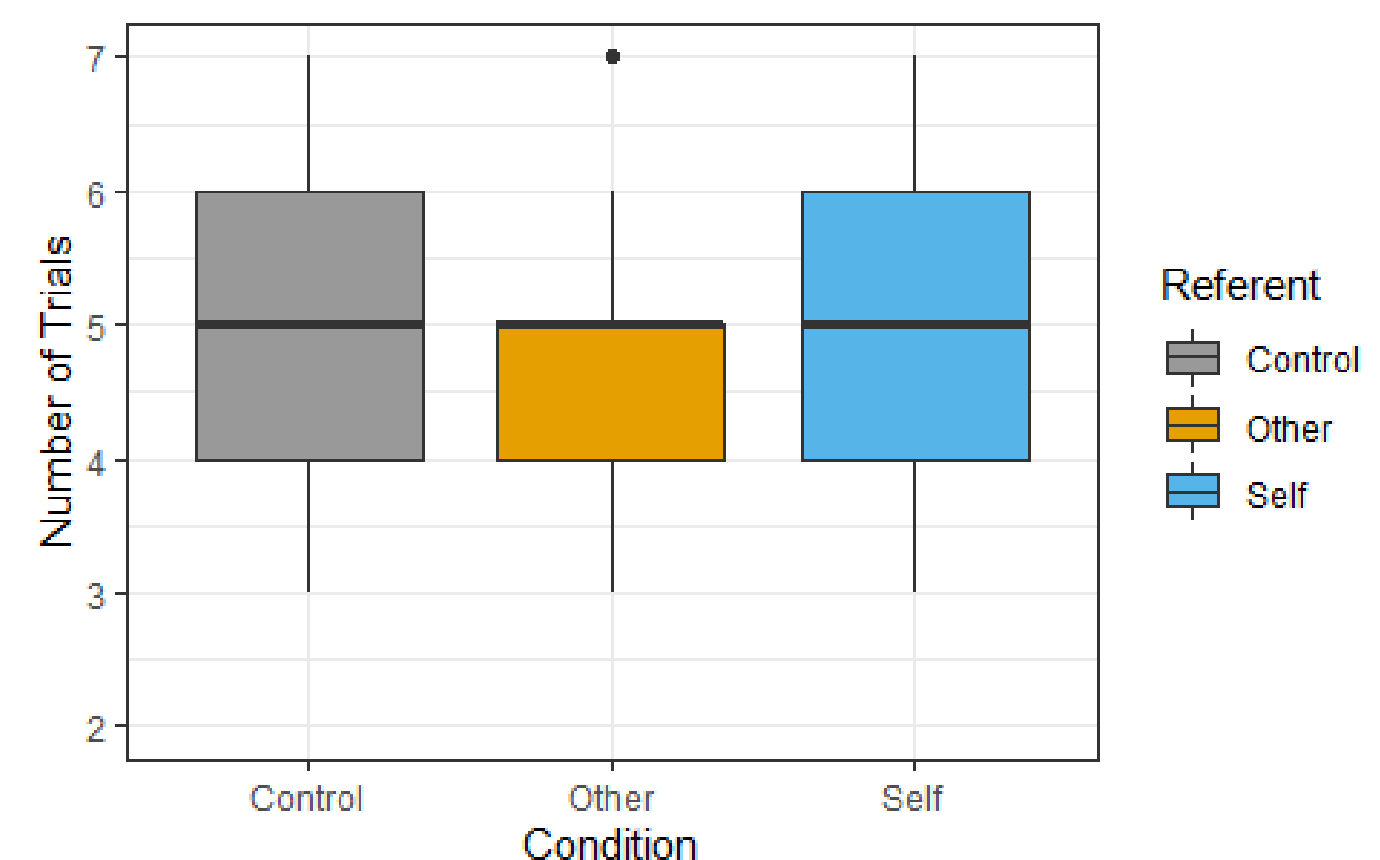


Figure 3. Boxplot depicting Corsi-Block span scores across trials within self, other and control conditions with plotted mean scores

Trial attempts

- To assess whether the self would reduce required number of attempts, a repeated measures ANOVA was used to compare mean attempts across trials (see Figure 4).
- There was a significant difference between attempts, but only for higher spans (six items) $F(2, 16) = 4.56, p = .03, \eta^2 = .36$. Posthoc analyses revealed a significant difference between self and control ($p < .001$).

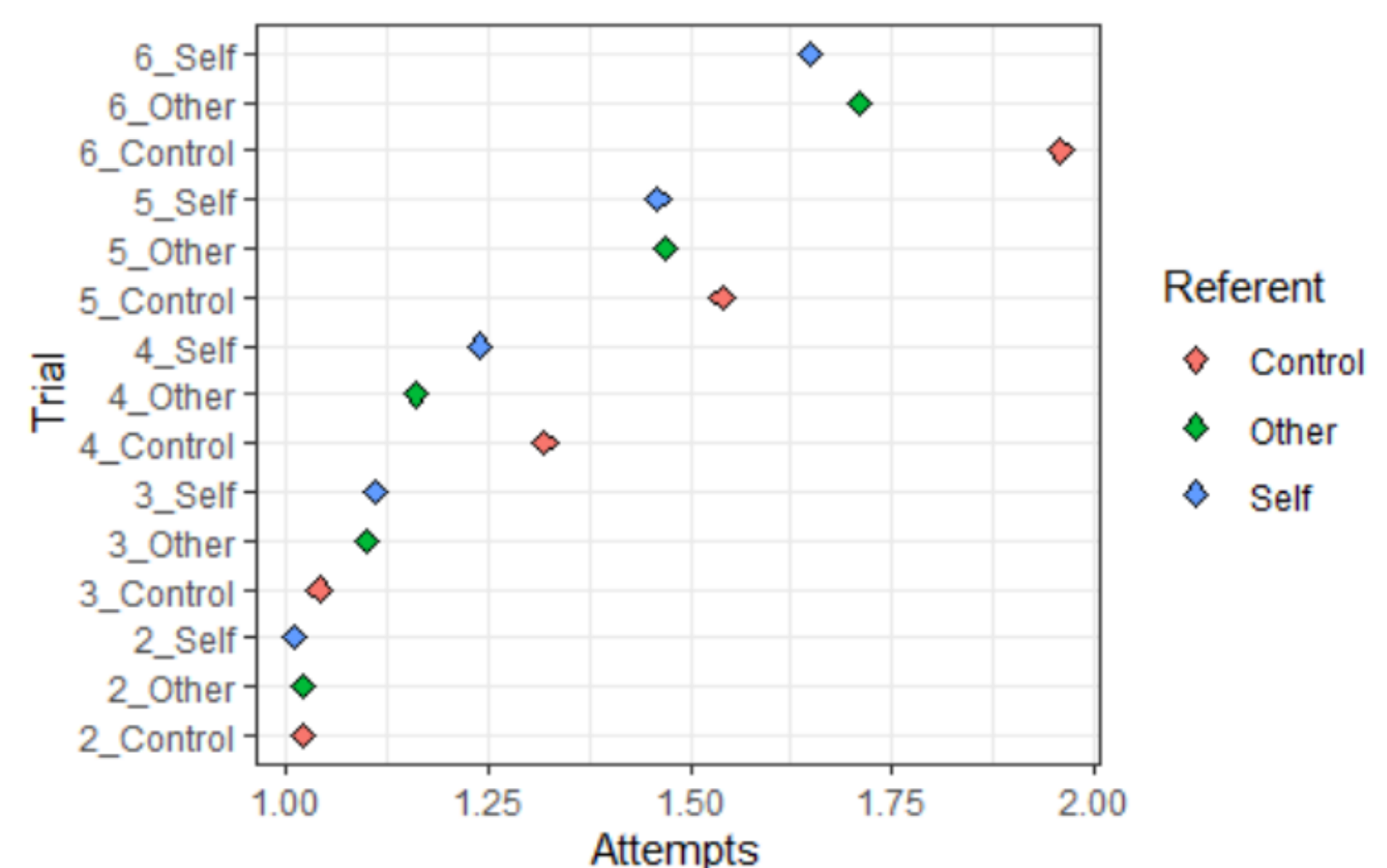


Figure 4. Scatterplot depicting mean number of attempts (out of three) for each trial under self, control and other conditions

Discussion and next steps

- Self-referencing did not impact children's WM span.** However, there was a difference in attempts during six block trials. **Children required fewer attempts when their owned items were presented compared to the control condition**, suggesting that **the self may have facilitated performance on trials that placed more demand on WM.**
- The methods used had some limitations.** For example, many children confused other and self-owned items due to similar categorical features.
- The next step** involves replicating the experiment with a **stronger cue of self** (own face) to investigate the impact of self-referencing on WM.

References

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