Do working memory deficits cause social problems in ADHD?

OPEN METHODS, OPEN DATA, AND PRELIMINARY RESULTS

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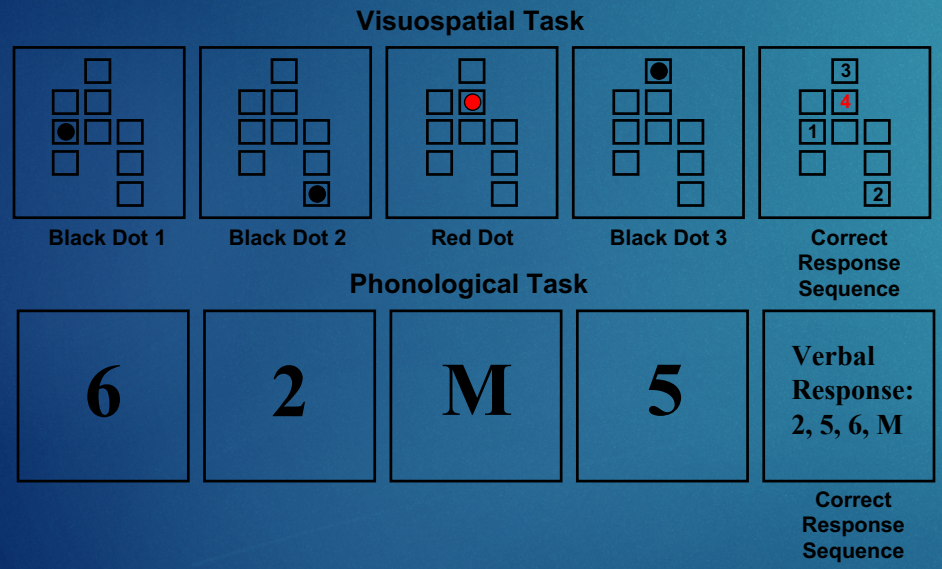
“Crowdsource our experiment”

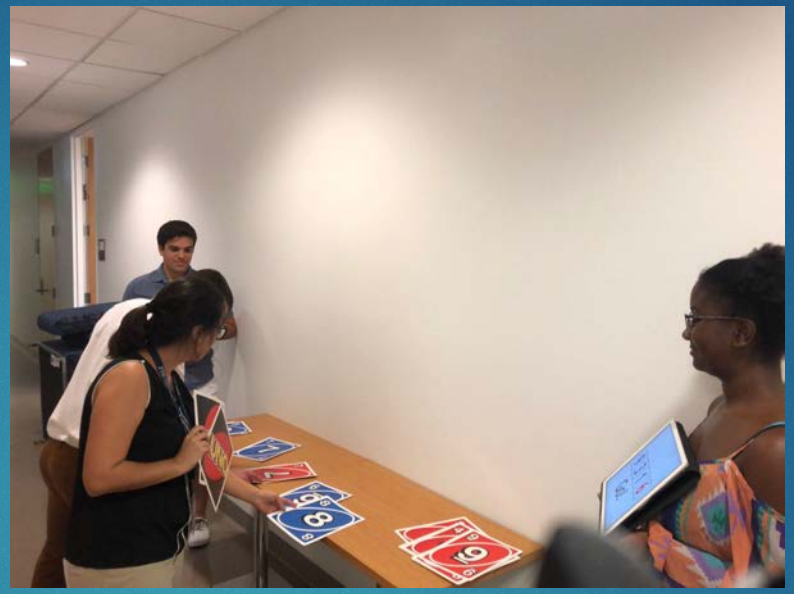


Good ideas we didn't use (but hope you will!)

- Use child confederate
- Manipulate group size, tasks involving more than 2 children
- Manipulate emotional valence of tasks
- Design alternate tasks

Social-working memory task development

		Working Memory	
		Low	High
Modality	Verbal		
	Spatial		



Really?

Go!

Measuring social behavior

- Peer ratings
- Self ratings
- Examiner (live global ratings)
  - Hoza et al. (2000)
- Observer (videotaped granular ratings)
  - Normand et al. positive/negative/neutral affect
  - Erhardt & Hinshaw (1994) codes (e.g., prosocial, non-compliance/disruption, verbal aggression)
  - Mikami et al. (2007) verbalization codes

1. What is your name?_____
2. What is your partner's name?_____

For the following, answer each question on a scale from 1 to 7.

1. How friendly was the child to you?

1	2	3	4	5	6	7
Not at all friendly			A little friendly			Very friendly

2.

a. . Did the child try hard **to work together** with you?

1	2	3	4	5	6	7
Did not try at all			Tried a little			Tried very hard

b. Did the child try hard **to do good** on the games?

1	2	3	4	5	6	7
Did not try at all			A little good			Tried very hard

3. Was the child **good at playing** the games?

1	2	3	4	5	6	7
Not good			A little good			Very good

4. Was the child **good at cooperating** with you?

1	2	3	4	5	6	7
Not good			A little good			Very good

5. How happy was the child during the games?

1	2	3	4	5	6	7
Not happy			A little happy			Very happy

6. How frustrated was the child during the games?

1	2	3	4	5	6	7
Not frustrated			A little frustrated			Very frustrated

7. Was the child nice to you?

1	2	3	4	5	6	7
Not nice			A little nice			Very nice

8. Did the child say mean things about themselves?

1	2	3	4	5	6	7
No			A few mean things			A lot of mean things

9.

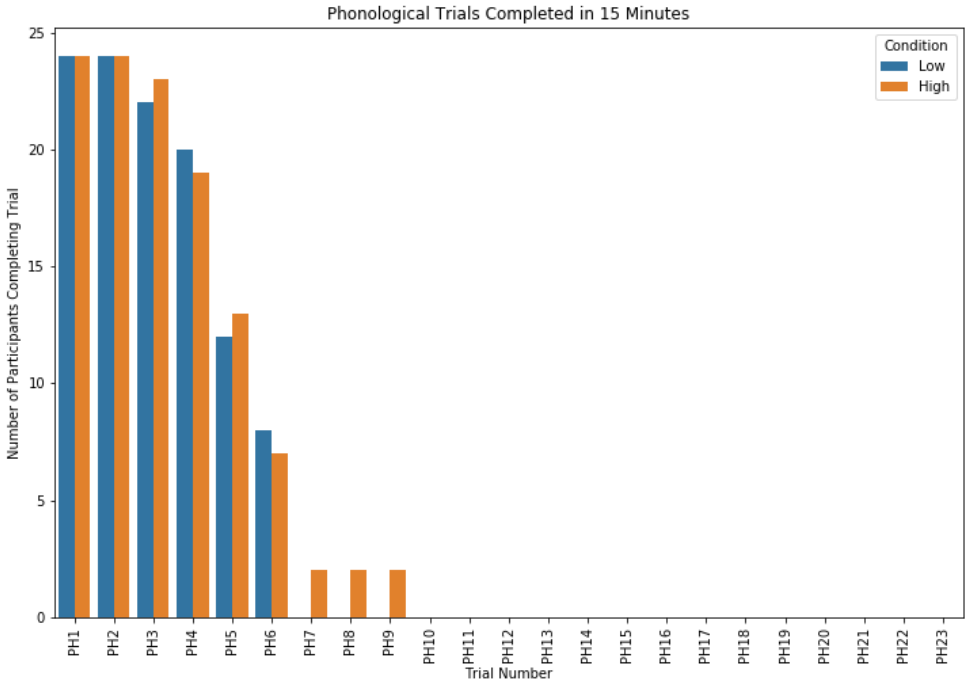
a. Were things the child said **helpful for working together**?

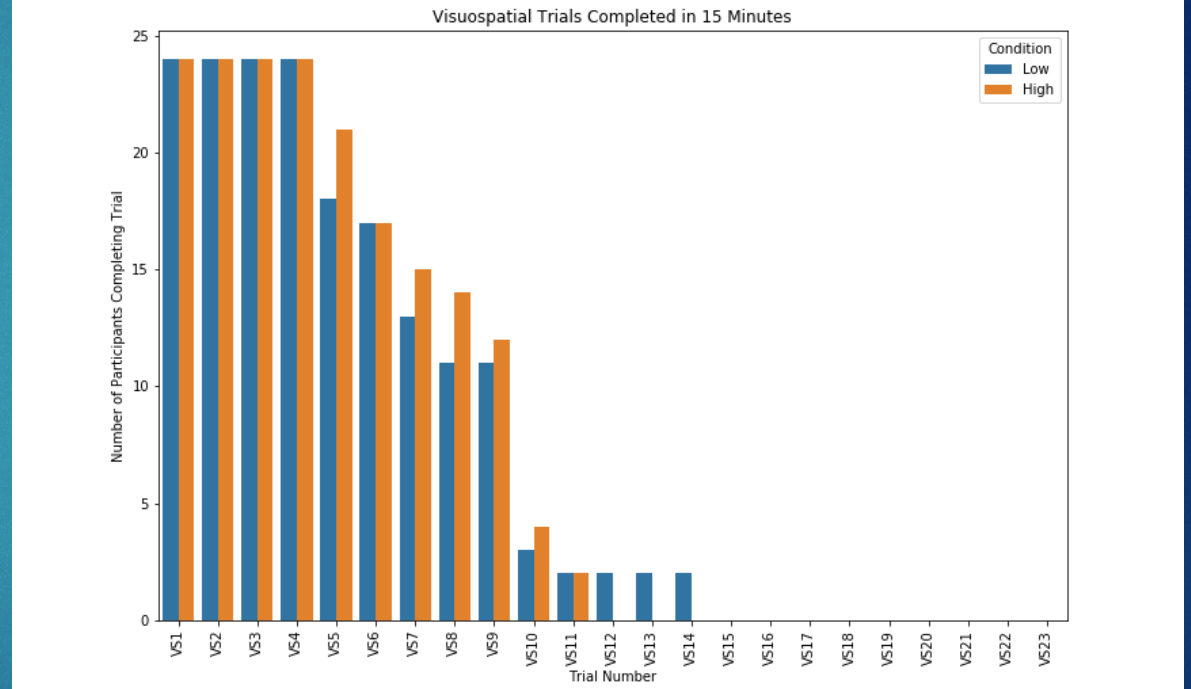
1	2	3	4	5	6	7
No			A little helpful			Very helpful

b. Were things the child said **helpful for playing the games**?

1	2	3	4	5	6	7
No			A little helpful			Very helpful

Feasibility of the dyadic social-working memory tasks

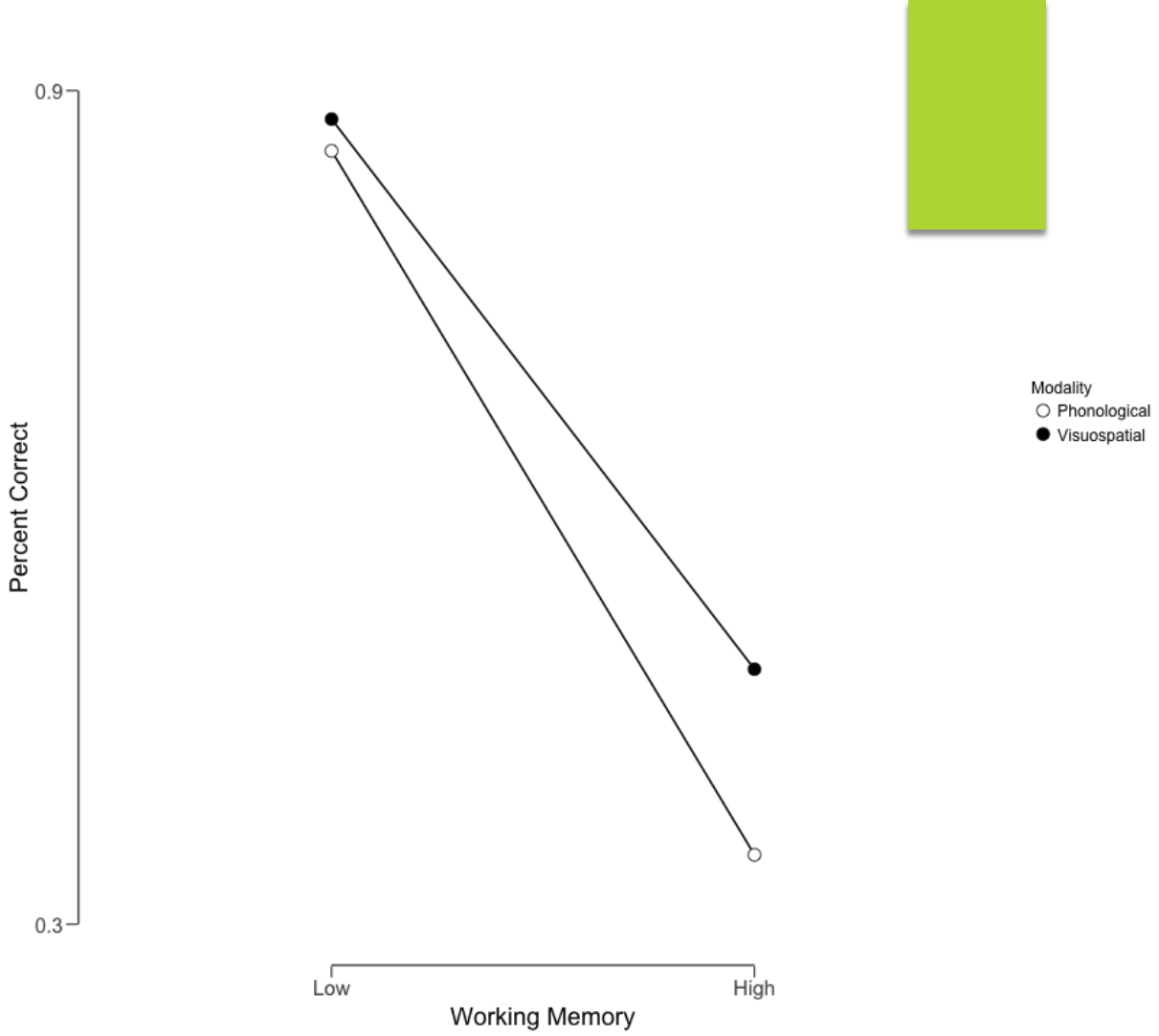




Twenty-nine children were administered at least one task; however, the current results focus on the 24 children (12 dyads) who completed both versions (i.e., high WM, low WM) of the phonological and visuospatial tasks.

Feasibility of the dyadic social-working memory manipulation

- Scores reflect each child dyad's performance (not individual children)
- Averaged stimuli correct per trial across the first six trials (or fewer if dyad failed to complete six trials in 15 minutes)

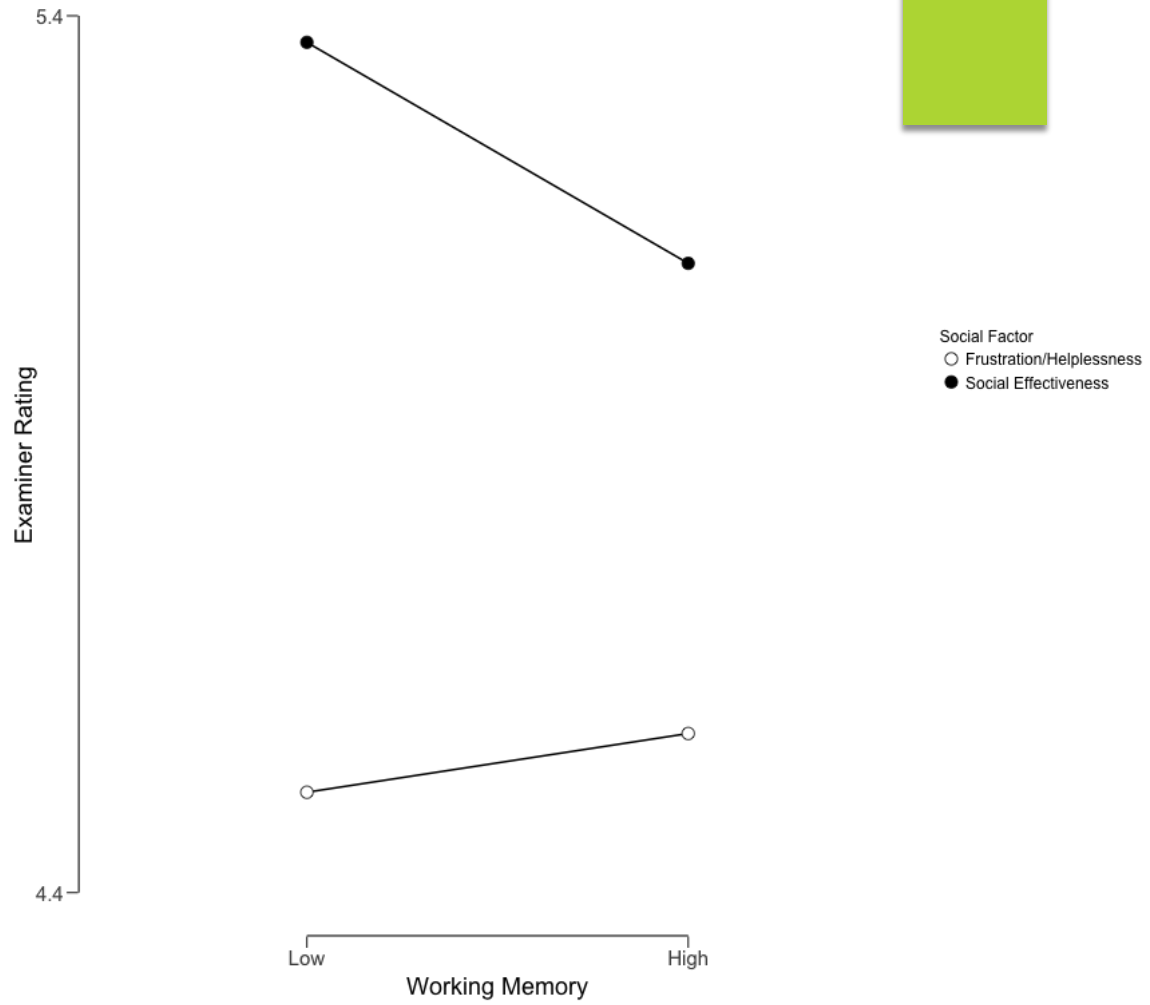


Paired Samples T-Test

			statistic	df	p	Mean difference	SE difference	Cohen's d
PH Percent Correct (Low WM)	PH Percent Correct (High WM)	Student's t	11.8	23.0	< .001	0.507	0.0431	2.40
VS Percent Correct (Low WM)	VS Percent Correct (High WM)	Student's t	11.8	23.0	< .001	0.396	0.0336	2.40

Feasibility of examiner-rated social behavior

- Scores reflect each individual child
- Averaged across items loading on relevant factors (i.e., social effectiveness, frustration/helplessness; Pelham et al., 2001)
- Collapsed across PH and VS tasks so unclear if effect is different across modality
  - Currently recoding via videotape review



Paired Samples T-Test

			statistic	df	p	Mean difference	SE difference	Cohen's d
Social Effectiveness (Low WM)	Social Effectiveness (High WM)	Student's t	1.245	23.0	0.226	0.2521	0.202	0.254
Frustration/Helplessness (Low WM)	Frustration/Helplessness (High WM)	Student's t	-0.585	23.0	0.564	-0.0670	0.115	-0.119

Setting expectations
How big of an effect can we reasonably expect?

- Previous studies linking working memory & social problems in ADHD
  - β= .18-.36
    - i.e., 1 SD change in WM = 0.18-0.36 SD change in social skills
- Estimated size of our WM manipulation
  - Cohen's *d*=2.40
    - i.e., 2.40 *SD* change in working memory from low to high condition
- Expected change in social behavior during low to high conditions (assuming WM/social correlation is fully causal)
  - Cohen's *d* = 0.43-0.86

Questions

- What data do you want to see to be convinced that working memory manipulation was successful?
- How to best analyze the dyadic WM task data?
  - Different child pairing across conditions
- Feedback on peer, examiner (global), and observer (granular) coding schemes?
- Proposals for additional behavioral codes?
  - Opportunities for collaboration: Your coding scheme, our coders!
- Control group(s)? Cross-diagnosis dyads?
- Experiment modifications?

Download materials & methods

[Open Science Framework (OSF) link here, will be available by time of presentation]

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