Introduction

Academic Impairment

- ~33-63% of children with ADHD exhibit significant academic impairment (Mayes & Calhoun, 2006).
- Above estimates suggest significant heterogeneity in academic outcomes.
- What are the mechanisms and processes associated with this heterogeneity?
- Impairments (e.g., academic) may predict long-term clinical outcomes better than the core ADHD symptoms (Pelham et al., 2005).

Neurocognitive Mechanisms

- In developmental samples, neurocognitive abilities predict academic outcomes (Swanson & Kim, 2007; Thorell, 2007).
- Many but not all children with ADHD exhibit neurocognitive and/or academic deficits (Rapport et al., 2008).
- **Working memory** promising candidate to explain academic impairment and heterogeneity.
- WM is associated with reading, math, and overall academic achievement among children with ADHD (Alloway & Stein, 2014; Mayes & Calhoun, 2007; Rogers et al., 2011).

Method

Participants

- 8-13 year old children
- Carefully diagnosed ADHD
- N = 47

Measures

- Kaufman Test of Educational Achievement (KTEA) - 2nd or 3rd edition
- Overall Academic Composite
- Reading Composite
- Math Composite
- Writing Composite
- Stop-Signal Task
- Behavioral Inhibition
- Processing Speed
- Phonological WM and Visuospatial WM tasks (Rapport et al., 2008)

Results

- Regression models for each academic domain were significant for reading, math, written language, and overall academic performance ($R^2 = .26$ to .41).
- PHWM and VSWM both uniquely predicted performance on the reading, math, written language, and overall academic composites ($\beta_{\text{range}} = .34$ to .48, all $p < .05$).
- BI and PS failed to uniquely predict academic achievement overall or in any assessed domain.

Conclusion

- Working memory (PH and VS) emerged as a unique neurocognitive predictor of academic achievement.
- Our findings are consistent with meta-analytic findings of large magnitude working memory deficits in ADHD based on best case analysis ($d \geq 2.0$; Kasper et al., 2012).
- Working memory deficits may be implicated in broad-based academic impairment in ADHD.
- Interventions that improve working memory may be able to target this important mechanism associated with academic underperformance.
- Working memory may be an appropriate target for novel treatment approaches for ADHD.

References

See supplemental handout.