



Executive Functioning in Rating Scales for ADHD Assessment: Ecologically Valid or Construct Invalid?

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Introduction

ADHD & Executive Function (EF)

- ADHD
 - Pervasive and chronic neurodevelopmental disorder associated with impairments in academic functioning and academic achievement (Thorell, 2007)
 - Early detection and intervention reduce symptom severity and functional impairment (Nigg, 2005)
- Executive Function (EF)
 - Higher-order cognitive processes associated with behavior and thought regulation (Wiebe et al., 2011)
 - Working Memory (WM), Inhibitory Control (IC), Set Shifting (SS) (Miyake et al., 2000)
 - May underlie ADHD behavior symptoms (Rapport et al., 2013)
 - EF is a potentially important candidate to target for early assessment (McDermott et al., 2012)

Types of EF Assessments

- Rating Scales
- Performance Tests

Purpose of Study

- Recent work suggests strong discord between EF rating scales and performance tasks (Toplak et al., 2013)
 - Rating scales frequently interpreted as reflecting improved ecological validity
- Few studies have examined convergent validity of rating scales and performance tests for predicting ecologically valid outcomes (e.g., academic functioning and academic achievement)

Participants

53 children referred to ADHD specialty clinic in Southeastern U.S. participating in a behavioral treatment ($N = 38$) or cognitive training study ($N = 15$)

- 18 girls and 35 boys
- Ages 7 – 13 years old ($M = 10.20$, $SD = 1.44$)
- 42 met criteria for ADHD based on parent K-SADS and multiple parent and teacher reports
- 6 met criteria for other clinical disorders, but not ADHD
- 5 did not meet criteria for any clinical disorders

Academic Measures

Academic Functioning

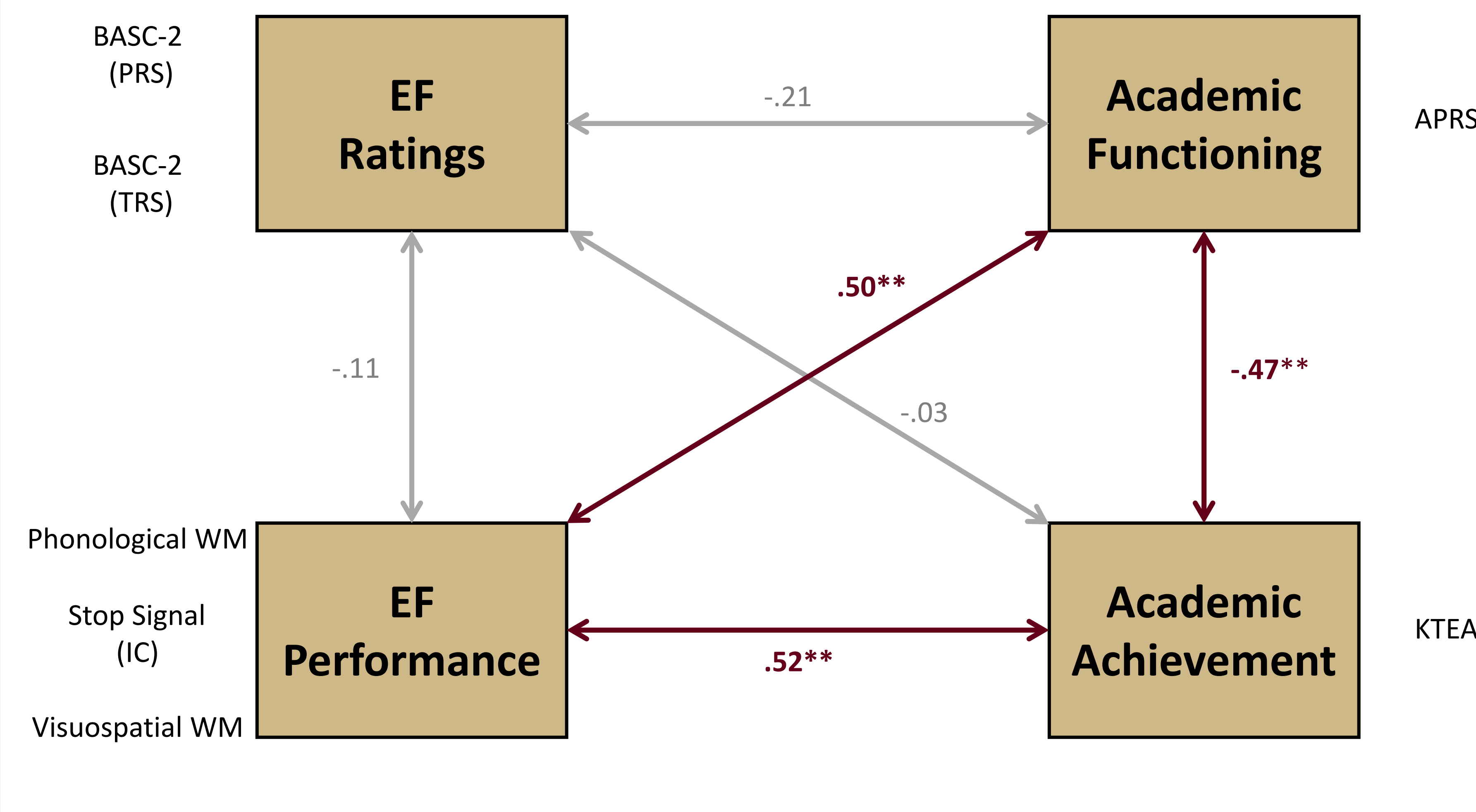
- Academic Performance Rating Scale (APRS) (DuPaul et al., 1991)
 - Teacher

Academic Achievement

- Kaufman Test of Educational Achievement-2/3 (KTEA-2/3) (Kaufman & Kaufman, 2004/2014)
 - Comprehensive Academic Achievement/Academic Skills Battery Composite Score
 - Child

Results

Figure 1. Intercorrelations among executive functioning measures and academic outcomes.



Note. Significant path shown in bold.
 $*p < .05$ $**p < .01$

Results

Table 1. Descriptive statistics ($N = 53$).

Variables	M	SD
<i>BASC-2 Executive Function scale (T-score)</i>		
Parent report (PRS)	66.83	11.14
Teacher report (TRS)	56.81	10.20
<i>Inhibitory Control (ms)</i>		
Stop-signal delay (SSD)	267.69	62.03
<i>Working Memory (stimuli correct/trial)</i>		
PH	3.21	0.73
VS	2.57	0.84
<i>Academic Achievement (standard score)</i>		
KTEA-2/3 Academic Skills Battery	106.94	15.74
<i>Academic Functioning (T-score)</i>		
APRS Total	46.58	8.43

Discussion

EF Measures

- Non-significant relations between EF Ratings and EF Performance

Academic Measures

- Strong association between Academic Ratings and Academic Performance

EF Measures & Academic Measures

- EF Performance strongly correlated with both Academic Performance and Academic Ratings
- Non-significant relation between EF Ratings and Academic Ratings
- Non-significant relation between EF Ratings and Academic Performance

Conclusion

Implications

- Findings contradict claims that EF rating scales reflect ecologically valid assessments of “real world” functioning
- Suggests limited ability of EF rating scales to predict EF abilities or academic outcomes in children with ADHD and related difficulties

Limitations & Future Directions

- Cross-sectional study
 - Need longitudinal studies
- No between-group comparison
 - Scales may predict differently for different groups

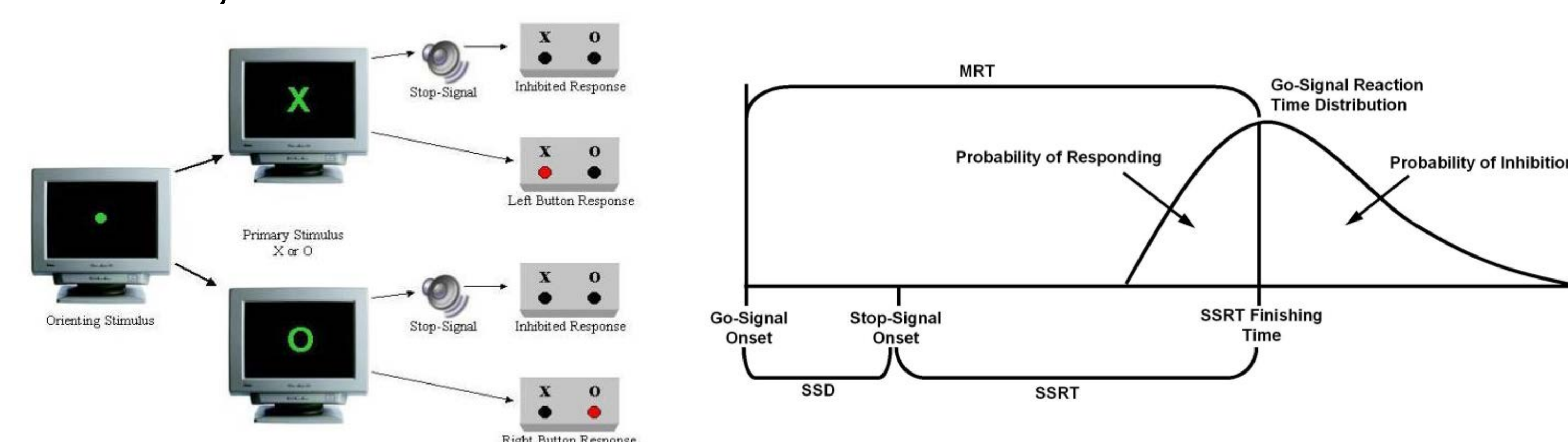
EF Measures

EF Rating Scales

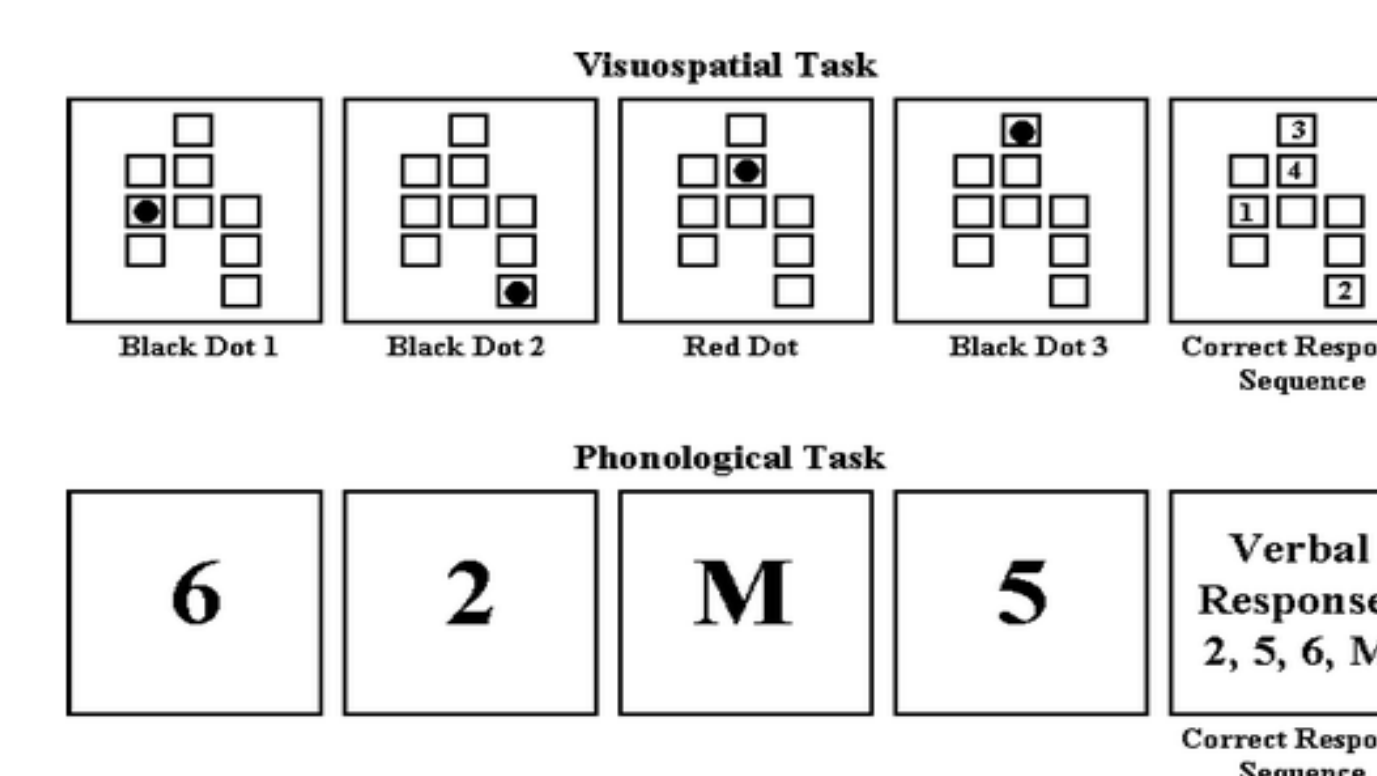
- Behavior Assessment System for Children-2 (BASC-2) (Reynolds & Kamphaus, 2004)
 - Executive Function Subscale
 - Parent (PRS) and Teacher (TRS)
 - Z-scores computed by averaging measurement of EF rating scales

EF Performance Tests

- Stop-Signal (Schachar et al., 2000; Alderson et al., 2007)
 - Child inhibitory control



- Rapport phonological and visuospatial working memory tests (Rapport et al., 2008)
 - Child working memory - Visuospatial (VS) & Phonological (PH)



- EF composite score computed by averaging z-scores across EF performance tests (4 WM, 4 IC)