

# ADHD Symptoms, Executive Dysfunction, & Perceived Stress

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## INTRODUCTION

- ADHD is a neurodevelopmental disorder characterized by hyperactivity, inattentiveness, & impulsiveness.
- Executive functioning is the cognitive process permitting goal-directed, future-oriented, problem-solving behavior.
  - Children with ADHD demonstrate a weakness in executive functioning (Martel et al., 2007).
- Perceived stress is the degree to which situation in one's life are appraised as stressful (Davis & Soistmann, 2022).
- ADHD consequences include poor academic performance, social impairments, & elevated rates of psychiatric comorbidities, which elevate stress (Oster et al., 2020).
- ADHD individuals experience physiological stress response differences (including higher cortisol levels), resulting in higher anticipation and active stressor stress and greater difficulty recovering from stress (Combs et al., 2015).
- Adolescents with ADHD report pervasive, constant daily stress that is disproportionate to scenario, lacking gradual development, and closely intertwined with anxiety (Oster et al., 2020).
- ADHD symptoms, especially inattention, are associated with higher scores on the Perceived Stress Scale, with individuals rating their lives as more unpredictable, uncontrollable, & overloaded (Oster et al., 2020).
- While past research in younger children suggests that girls with ADHD may experience more severe intellectual impairments than boys, other research suggests no significant sex differences (Martel et al., 2007).

## METHODS

### Participants:

- Data from the National Project on Achievement in Twins (Hart et al., 2019).
- Sample includes children ages 6 through 18 years old for child self-report data (N=1100) and a parent for parental report data (N=1133).
- Sample of children included 51.8% females and 48.2% males.

### Measures:

- ADHD Symptoms (ADHD-S):** Strengths and Weaknesses of Attention-Deficit/Hyperactivity Disorder Symptoms and Normal Behavior Scale (SWAN), which asks parents 18 questions on a 7-point Likert scale, with a higher score meaning less ADHD-S (Swanson et al., 2012).
- Executive Dysfunction (ED):** Behavior Rating Inventory of Executive Function (BRIEF) scale, which asks parents 86 questions on a 3-point Likert scale (Smith et al., 2008).
- Perceived Stress (PS):** Perceived Stress Scale, which asks child 13 self-reported questions on a 3-point Likert scale (Cohen et al., 1983).
- Sex:** twin sex.

### Procedures:

- Pearson correlations between ADHD-S, ED, and PS.
- Hierarchical multiple regression
- General Linear Model (MANOVA)

### Variable Demographics

Variable	Minimum Value	Maximum Value	Mean	Standard Deviation
Average ADHD Symptoms	1.00	7.00	4.56	1.06
Total Executive Dysfunction	0	258	132.60	37.454
Total Perceived Stress	0	32	12.06	5.403
Age	6.65	17.56	13.25	2.21

## Hypotheses

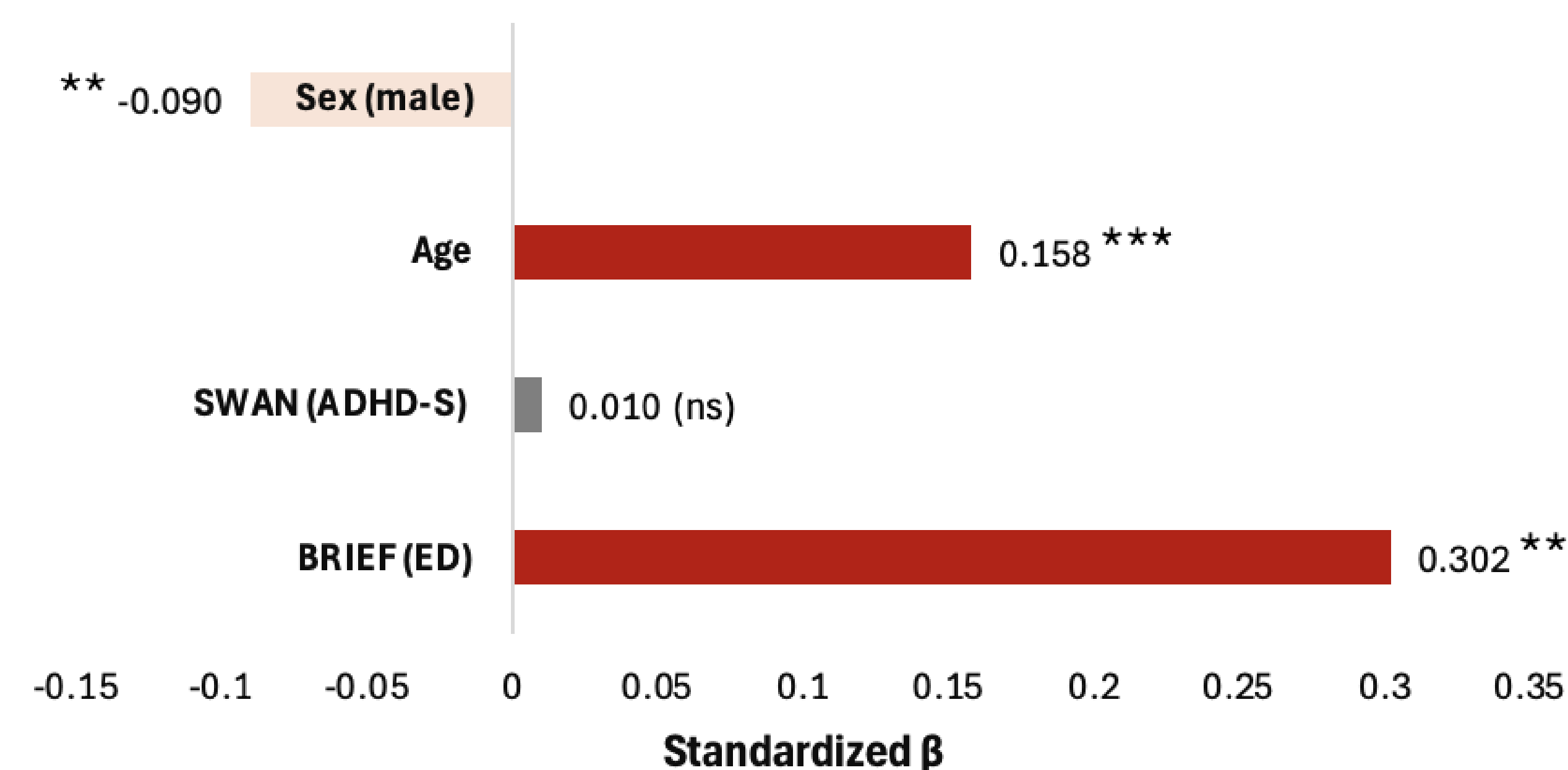
- ADHD symptoms (ADHD-S) will be positively correlated with executive dysfunction (ED).
- ADHD-S and ED will both be positively correlated with perceived stress (PS).
- ADHD-S and ED with both predict PS, both before and after controlling for sex.
- Males and females will exhibit differences in PS.

## RESULTS

### Correlation Matrix

	ADHD Symptoms	Executive Dysfunction	Perceived Stress
ADHD Symptoms			
Executive Dysfunction	-0.665*		
Perceived Stress	-0.191*	0.283*	
Age	0.119*	-0.096*	0.136*

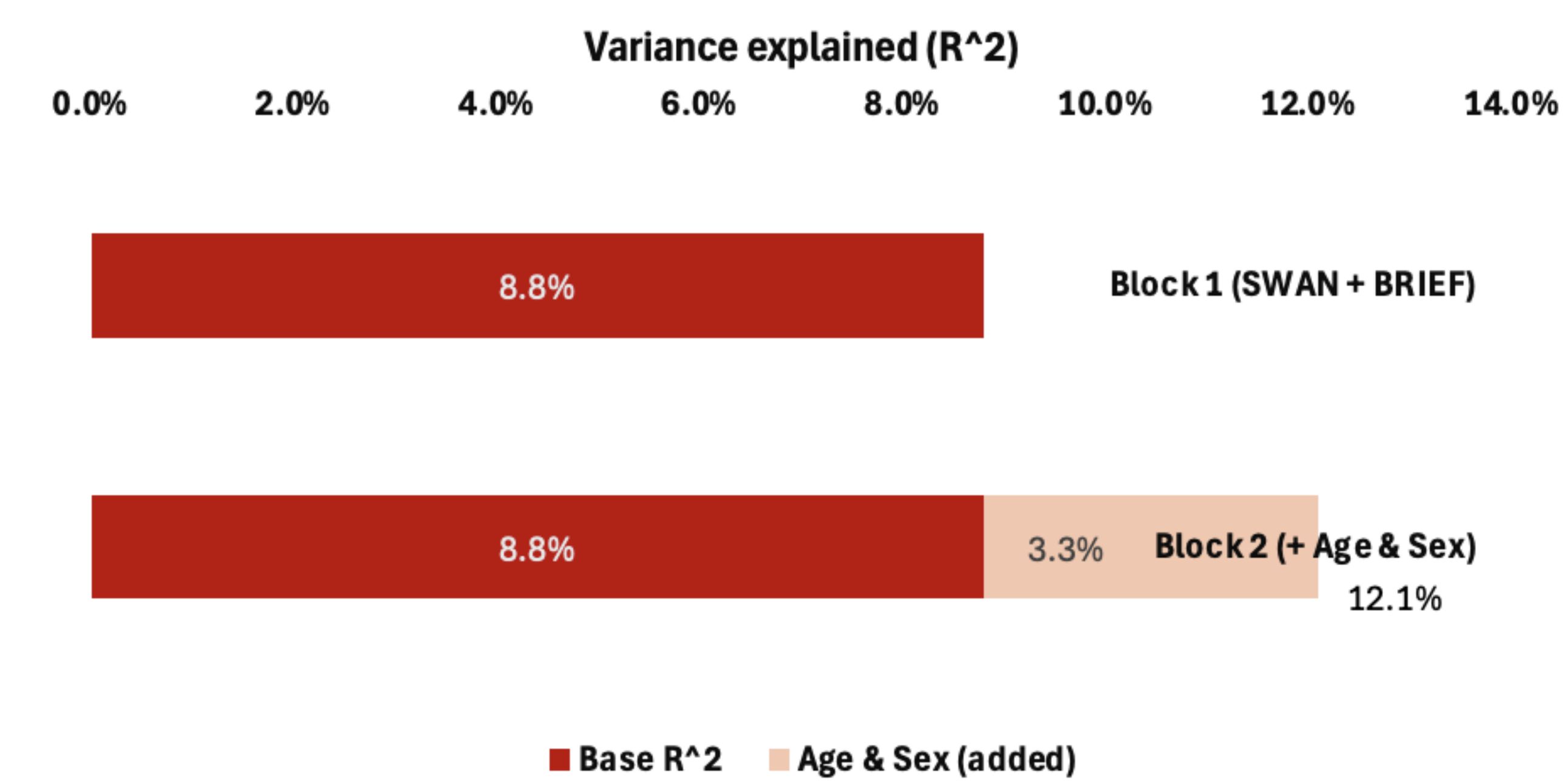
### Predictors of Perceived Stress (PS)



Standardized regression coefficients ( $\beta$ ) from Block 2 of a hierarchical regression predicting PS. ED (BRIEF) was the strongest significant predictor ( $\beta = .302, p < .001$ ). ADHD-S (SWAN) were nonsignificant ( $\beta = .010, p = .804$ ). Age ( $\beta = .158, p < .001$ ) and sex ( $\beta = -.090, p = .002$ ) each contributed independently. \*\*  $p < .01$ , \*\*\*  $p < .001$ .

- Greater ED significantly predicted higher PS, even after controlling for age and sex.
- Older children and girls both reported significantly greater PS.

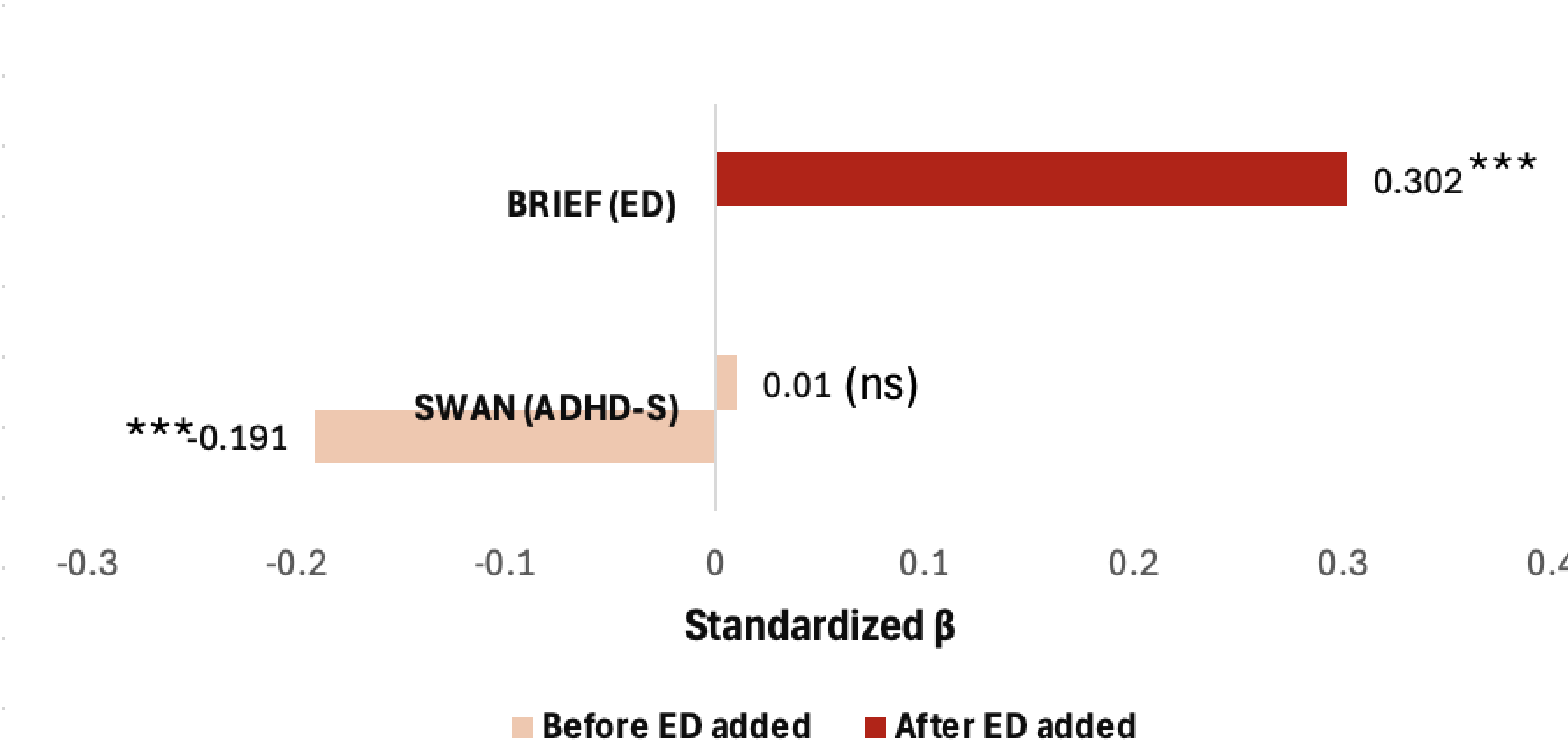
### Age & sex explain additional variance in PS



Variance in PS explained by each regression model. Block 1 (SWAN + BRIEF) for 8.8% of variance. Adding age and sex in Block 2 increased explained variance to 12.1% ( $\Delta R^2 = .033$ ). Both models significant at  $p < .001$ .

- ED and ADHD-S together explained 8.8% of the variance in PS.
- Adding age and sex improved the model to 12.1%.

### ADHD-S predict PS until ED is accounted for



ADHD-S (SWAN) significantly predicted PS when entered alone ( $\beta = -.191, p < .001$ ). This effect became nonsignificant ( $\beta = .010, p = .804$ ) once ED (BRIEF) was added.

- ADHD-S initially appeared to predict PS, but this relationship became insignificant once ED was accounted for.

## Discussion

- ED was the strongest predictor of PS in children, beyond ADHD-S severity, age, and sex.
- ADHD-S predicted PS when tested alone, but this entirely disappeared when ED was introduced.
  - Suggests that the relationship between ADHD-S and PS may operate through ED.
  - ED may be the symptom of ADHD that specifically contributes to an increased PS.
- Parent-reported ADHD-S and ED data suggests that child PS directly relates to the symptoms and behaviors observed by parents.
- Older children reported greater PS, likely reflecting the social, academic, and organizational demands that increase with age.
- Girls reported greater PS, supporting prior sex-difference literature that suggests greater anxiety and stress in females during youth (Gbessemehlan et al., 2020).
- Future research should investigate the impact of ED interventions on PS in children with ADHD-S.

## ACKNOWLEDGEMENTS

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