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## Does Anxiety Moderate the Relationship Between ADHD Inattention Symptoms and Cognitive Flow States?

A. Shea Hall

Georgia Southern University, [anna.shea.hall@gmail.com](mailto:anna.shea.hall@gmail.com)

Dorothe Cross

Georgia Southern University, [dcrossmokdad@georgiasouthern.edu](mailto:dcrossmokdad@georgiasouthern.edu)

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# Does Anxiety Moderate the Relationship between ADHD Inattention Symptoms and Cognitive Flow States?

A. Shea Hall & Dorthie Cross, PhD

## BACKGROUND

- Although some studies have found a positive correlation between ADHD symptoms and self-reported cognitive flow states, other studies do not find such a relationship.<sup>1, 2</sup>
- ADHD is commonly comorbid with anxiety, which has been found to be negatively correlated with flow states.<sup>3, 4</sup>
- It is possible that some of the inconsistencies across studies might be explained by level of anxiety.

### Purpose

The purpose of the current study is to explore the relationships between self-reported Attention-Deficit/Hyperactivity Disorder (ADHD) symptoms and cognitive flow states and whether anxiety moderates that relationship.

### Hypotheses

- Self-reported inattention symptoms will negatively correlate with self-reported flow states.
- Self-reported anxiety symptoms will moderate that relationship, specifically in that the negative correlation between inattention and flow will be most pronounced at high levels of anxiety and less pronounced or absent at low levels of anxiety.

## RESULTS

- Hypothesis 1:** To test our first hypothesis that inattention symptoms would negatively correlate with self-reported flow states, we conducted Pearson correlations. **We found that BAARS-IV inattention and CPAC flow were negatively correlated, supporting our hypothesis (see Table 1).**

**Table 1. Pearson Correlations Among Flow, Inattention, and Anxiety Scores**

	1	2
1. Flow	-	
2. Inattention	-.14*	-
3. Anxiety	.10	.40**

NOTE: \* $p < .05$ , \*\* $p < .01$

- Hypothesis 2:** To test our second hypothesis that anxiety symptoms would moderate the relationship between inattention and flow, we conducted a multiple regression to predict CPAC flow and included three predictors: (1) BAARS-IV inattention, (2) GAD-Q anxiety, and (3) inattention  $\times$  anxiety interaction term.

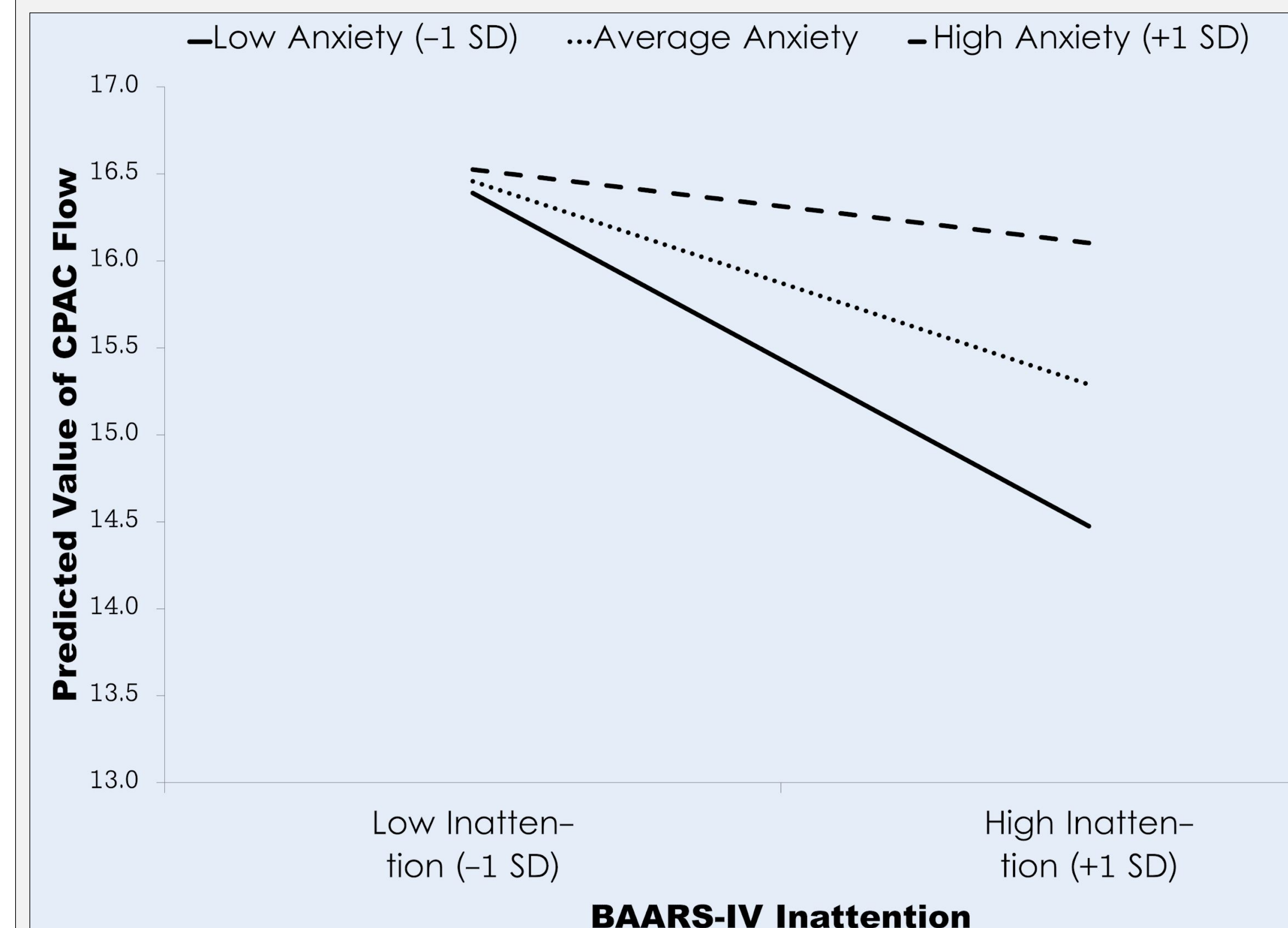
**Table 2. Multiple Regression Predicting Flow Scores Based on Inattention and Anxiety**

	b (95% CI)	$\beta$
Inattention	-.23 (-.34, -.11)	-.48***
Anxiety	-.20 (-.44, .04)	-.35
Inattention $\times$ Anxiety	.02 (.004, .03)	.79**

NOTE: b = unstandardized coefficient, CI = confidence interval,  $\beta$  = standardized coefficient; \*\* $p < .01$ , \*\*\* $p < .001$

- Although both inattention and the inattention-anxiety interaction were significantly related to flow (see Table 2), the interaction was in the opposite direction as hypothesized (see Figure 1).
- At low levels of inattention, participants reported equivalent levels of flow, regardless of anxiety level. At high levels of inattention, however, flow depended on anxiety level. As anxiety increased, flow increased such that at high levels of anxiety, high inattention participants looked similar to low inattention participants.

**Figure 1. A visualization of the relationship between inattention and cognitive flow and moderation of that relationship by anxiety**



## METHOD

### Participants & Procedure

- The sample consisted of 292 college students recruited through the department's Sona Systems site to complete a Qualtrics survey in exchange for course credit.
- Analyses were based on data from 243 participants who passed all data quality checks.

Self-reported Participant Demographics				Race/ethnicity	N
Age	Gender	N		Asian American/Pacific Islander	6
M 20.56	Men 63		Black/African American	59	
SD 4.45	Non-binary 2		Hispanic/Latinx/Latin Origin	6	
Range 18-49	Women 177		Middle Eastern/North African	2	
			Multi-racial/ethnic	21	
			White	148	
			Did not respond	1	

### Materials

- Barkley Adult ADHD Rating Scale (BAARS-IV<sup>5</sup>):** Inattention subscale, 9 items, rated 1 (*never or rarely*) to 4 (*very often*)
- Generalized Anxiety Disorder Questionnaire (GAD-Q<sup>6</sup>):** Total score, 17 items, rated 0 (*not present*) or 1 (*present*)
- Cognitive Processes Associated with Creativity Scale (CPAC<sup>7</sup>):** Flow subscale, 4 items, rated 1 (*never*) to 5 (*always*)
- Demographics Form**

## DISCUSSION

- We found evidence supporting our hypothesis that inattention symptoms negatively correlate with self-reported flow states, but we did not find evidence that supported our hypothesis that anxiety symptoms would moderate that relationship in the way we expected.
- It is possible that people with high levels of both ADHD and anxiety symptoms may be more likely than those with high ADHD symptoms alone to experience flow states, possibly making them appear comparable to neurotypical-presenting persons in high-pressure situations. Anxiety could be a kind of buffer or adaptive compensation for symptoms of inattention.

### Limitations & Future Directions

- These findings are correlational, and further research must be conducted to establish the direction of the relationship.
- These findings are based on self-report, so we cannot know from these data the degree to which inattention and anxiety are associated with actual flow states.
- The interpretation that these findings could suggest an advantage of anxiety for people with high ADHD symptoms in high-pressure situations needs to be tested empirically, perhaps by varying task difficulty or stress induction.

## CONTACT INFORMATION

**A Shea Hall**, Georgia Southern University, can be reached at [ah14635@georgiasouthern.edu](mailto:ah14635@georgiasouthern.edu)

**Dorthie Cross, PhD**, Georgia Southern University, can be reached at [dcrossmokdad@georgiasouthern.edu](mailto:dcrossmokdad@georgiasouthern.edu)

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