

ADHD Symptoms and Academic Performance Among Adolescents: The Roles of Executive Dysfunction, Smartphone Distraction, and Academic Procrastination

Ádám. Székely¹, Andrés. Velasco^{2*}, Martín. Echeverría³

¹ Department of Clinical Psychology, Eötvös Loránd University, Budapest, Hungary

² Department of Clinical Psychology, Universidad Nacional de Colombia, Bogotá, Colombia

³ Department of Clinical Psychology, University of the Republic, Montevideo, Uruguay

* Corresponding author email address: andres.velasco@unal.edu.co

Editor

John S. Carlson
Distinguished Professor of the
Department of Educational
Psychology, Michigan State
University, East Lansing, MI,
United
carlsoj@msu.edu

Reviewers

Reviewer 1: Seyed Ali Darbani
Assistant Professor, Department of Psychology and Counseling, South Tehran
Branch, Islamic Azad University, Tehran, Iran.
Email: Ali.darbani@iau.ac.ir
Reviewer 2: Kamdin Parsakia
Department of Psychology and Counseling, KMAN Research Institute, Richmond
Hill, Ontario, Canada. Email: kamdinarsakia@kmanresce.ca

1. Round 1

1.1. Reviewer 1

Reviewer:

The inclusion criterion stating that participants “had used a smartphone for at least six months” may introduce selection bias because adolescents with no personal smartphone access or irregular access were excluded from the sampling frame. This criterion is especially important in a study examining socioeconomic variation and academic performance. Please justify why six months of smartphone use was required, indicate whether device ownership and shared-device use were distinguished, and discuss how excluding nonusers may have affected the generalizability of the findings to economically disadvantaged adolescents.

The sentence “Students were excluded when school records indicated a diagnosed intellectual disability, a severe neurological condition, an uncorrected sensory impairment, or another condition that would prevent independent completion of the measures” is too broad and potentially subjective. Please specify who reviewed the records, what diagnostic documentation was required, how “severe neurological condition” was defined, and what was included under “another condition.” The authors should also clarify whether students with learning disabilities, autism spectrum disorder, anxiety,

depression, or other common comorbidities were retained, because such conditions could influence executive functioning, procrastination, digital behavior, and academic performance.

The manuscript states that ADHD symptoms were assessed using “the School Version of the ADHD Rating Scale–5,” completed by a teacher. Please provide full psychometric and adaptation information for the Spanish-language version used in Colombia. This should include the translation source, evidence of linguistic and cultural validity, previous reliability estimates in Spanish-speaking adolescents, scoring procedures, and the rationale for using only teacher reports. Because ADHD diagnosis requires symptoms across settings, the exclusive use of teacher ratings may capture school-based manifestations but not symptoms at home or in other environments. The absence of parent and self-report ratings should be justified and acknowledged more explicitly.

The measurement results report average variance extracted values above .50 and strong composite reliability, but discriminant validity is not adequately demonstrated. The statement that “the distinction among the constructs was additionally supported by the moderate correlations” is insufficient for a latent-variable analysis. Please report a formal assessment such as the heterotrait–monotrait ratio, the Fornell–Larcker criterion, or confidence intervals around latent correlations. This issue is particularly important because ADHD symptoms, executive dysfunction, and academic procrastination are conceptually overlapping and may share item content related to task initiation, organization, attention, and completion.

The structural model includes several covariates, yet their coefficients are omitted from the Results. The note below Table 3 states that the model controlled for “age, gender, grade level, school sector, socioeconomic status, nightly sleep duration, daily smartphone-use duration, previous ADHD diagnosis, and city,” but the manuscript does not report which endogenous variables were regressed on each covariate or whether any covariate effects were significant. Please provide the full covariate specification and coefficients, at least in a supplementary table, and clarify how categorical predictors such as city, gender, school sector, and socioeconomic status were coded.

Authors uploaded the revised manuscript.

1.2. Reviewer 2

Reviewer:

The use of the BRIEF–2 Self-Report Form requires greater methodological precision. The manuscript states that “the Global Executive Composite was used as the principal indicator of executive dysfunction,” yet the structural model appears to treat executive dysfunction as a latent construct based on seven clinical-scale indicators. Please clarify whether the analysis used the observed Global Executive Composite, the seven scale scores as indicators, or item-level indicators. The manuscript should consistently distinguish between scale scoring for descriptive analyses and latent-variable specification for confirmatory factor analysis and structural modeling.

The smartphone-distraction measure is described as having been reviewed by bilingual psychologists and pilot-tested, but no formal cross-cultural adaptation procedure is reported. The sentence “The Spanish wording of the instrument was reviewed by bilingual psychologists and educational specialists familiar with Colombian Spanish” should be expanded to indicate whether forward translation, back-translation, expert-panel reconciliation, cognitive interviewing, and measurement-invariance testing were conducted. Because smartphone terminology and patterns of digital engagement may vary culturally and developmentally, a more rigorous account of adaptation is necessary.

The manuscript reports that references “primarily applicable to university students were replaced with equivalent secondary-school activities” in the academic procrastination scale. This constitutes a substantive modification of an existing instrument and may affect its content validity and factor structure. Please provide the exact nature and number of modified items, describe the expert-review process, report pilot-testing results, and explain whether the revised version should still be referred to by the original scale name. The authors should also consider including the adapted items in a supplementary appendix to permit evaluation and replication.

Academic performance was calculated from five subject grades and then standardized “within each school and grade level.” This procedure is reasonable, but the manuscript alternates between reporting the original 0-to-5 grade scale in Table 1 and

using standardized scores in the correlations and structural model. Please make this distinction clearer throughout the Methods, Results, tables, and abstract. The authors should also justify the selection of Spanish, mathematics, natural sciences, social sciences, and English, report the reliability or factor loadings of these subject grades, and explain how missing grades, repeated courses, accommodations, or differences in curricular level were handled.

The data-collection procedure states that the student assessment required “approximately 35 to 45 minutes,” but the administration conditions require further control. Please indicate whether all questionnaires were completed in one sitting, whether breaks were permitted, whether students with reading difficulties received assistance, and whether questionnaires were administered electronically or on paper. Given the study’s focus on attention and executive dysfunction, fatigue and order effects may have disproportionately influenced students with elevated ADHD symptoms. The authors should explain why the instruments were presented in a fixed sequence rather than counterbalanced.

The ethical statement is incomplete because it reports only that “approval was obtained from the institutional research ethics committee responsible for the study.” Please provide the official name of the ethics committee, the approval number, and the approval date. The manuscript should also explain the procedures for safeguarding minors’ confidentiality, storing identifiable linkage files, limiting access to academic records, and responding to participants who displayed elevated ADHD symptoms or significant functional impairment. Because the study collected teacher ratings and official grades, the data-governance procedures should be described in greater detail.

The statistical-analysis section indicates that “full-information maximum-likelihood estimation was used” when missingness was compatible with a missing-at-random assumption, but the Results do not report the extent or pattern of missing data. Please provide the percentage of missingness for each variable, the results of any statistical assessment of missingness, and the number of cases retained through full-information maximum likelihood. The authors should also state whether missingness occurred at the item, scale, teacher-rating, or academic-record level and whether sensitivity analyses using complete cases produced materially different estimates.

The manuscript reports confirmatory factor analysis results in Table 2 but provides insufficient information regarding model specification. The sentence “The hypothesized measurement model provided a good fit” should be supported by a clearer description of the number of latent factors, the indicators assigned to each factor, any correlated residuals, the estimator used for ordinal items, and the treatment of non-normality. If item-level Likert responses were modeled, robust weighted least squares may be more appropriate than robust maximum likelihood. If parcels or scale scores were used, the parceling or aggregation strategy must be explicitly justified.

Authors uploaded the revised manuscript.

2. Revised

Editor’s decision after revisions: Accepted.

Editor in Chief’s decision: Accepted.