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REVIEW ARTICLE

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Puzzle Pieces of Survival: Correlating Executive Function and Resilience in Students with High Adverse Childhood Experiences

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ABSTRACT

Adverse childhood experiences (ACEs) are associated with long-term cognitive and psychological outcomes that influence academic functioning. Executive function—comprising working memory, inhibitory control, and cognitive flexibility—has been identified as a key mechanism linking early adversity to adaptive outcomes. Resilience, meanwhile, represents the capacity to adapt positively despite adversity. This study examined the relationship between executive function and resilience among students with high ACE exposure using a correlational design. Results indicate a significant positive association between executive functioning and resilience, suggesting that cognitive regulation may support adaptive coping among individuals exposed to early adversity. Findings contribute to trauma-informed educational research and highlight the value of strengthening executive skills to support resilience.

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KEYWORDS

Adverse Childhood Experiences, Executive Functioning, Resilience, Cognitive Development, Trauma, Higher Education.

Introduction

Adverse childhood experiences (ACEs) include abuse, neglect, and household dysfunction occurring during childhood [1]. Research consistently shows that ACE exposure predicts psychological, cognitive, and educational difficulties [2]. Neurodevelopmental studies indicate that adversity can disrupt prefrontal cortex development, affecting executive functioning [3]. Understanding the cognitive mechanisms that support adaptation among students exposed to adversity remains critical for higher education research.

Literature Review

Executive function refers to higher-order cognitive processes that support goal-directed behavior [4]. Strong executive skills help individuals regulate emotions, attention, and behavior in challenging contexts [5].

Resilience is defined as adaptive functioning despite adversity [6]. Studies suggest executive function contributes to resilience by enabling problem solving and emotional regulation [7].

Research in developmental and educational psychology increasingly suggests that resilience among individuals exposed to adversity is influenced by complex interactions between cognitive, emotional, and environmental factors. Executive functioning, in particular, has been identified as a key regulatory system that supports adaptive coping, decision-making, and stress management in challenging contexts. Studies have shown that early life stress can alter neurocognitive processes associated with attention, working memory, and behavioral regulation, which may subsequently affect adjustment and well-being in academic settings [8].

At the same time, resilience research emphasizes that adaptive outcomes are shaped not only by individual cognitive capacities but also by protective systems such as supportive relationships, school environments, and psychological resources [9]. Recent empirical work also indicates that executive functioning may interact with emotional regulation processes to influence how young adults respond to adversity and academic stressors [10]. Furthermore, emerging trauma and resilience frameworks highlight the importance of examining how cognitive control processes contribute to positive adaptation following childhood adversity [11]. In higher education contexts, resilience has been linked to improved academic persistence and psychological adjustment among students who have experienced early life stress, suggesting that cognitive and psychosocial mechanisms jointly shape outcomes [12].

Method

A quantitative correlational design will be used to evaluate the association between perseverative errors (WCST) and resilience (BRS) among college students identified as having high ACE exposure.

Participants

A sample of 155 college students will be screened using the Adverse Childhood Experiences Questionnaire. Forty (n = 40) students met the pre-specified high-ACE cutoff and comprised the analytic sample. Sampling was purposive: only students scoring in the high ACE range were invited to the full cognitive and resilience assessment.

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Research Instruments

- **Adverse Childhood Experiences Questionnaire (screening):** Standard 10-item ACE measure used to identify high-ACE participants.
- **Wisconsin Card Sorting Test (WCST):** Standard administration; due to data availability, only the perseverative errors index was recorded and used as the study's EF measure. Perseverative errors reflect failure to shift set after the sorting rule changes and are interpreted as an index of cognitive inflexibility [2].
- **Brief Resilience Scale (BRS):** A 6-item self-report instrument measuring capacity to recover from stress; higher scores indicate greater resilience [4].

Procedure

The study will be conducted in four major phases: screening, recruitment, testing, and data management.

Screening Phase

The Adverse Childhood Experiences (ACE) Questionnaire will be administered to 155 college students enrolled in the City College of San Jose del Monte. Screening will be 26 conducted in a controlled classroom setting, the students will be informed that participation is voluntary. The ACE scores will be tallied to determine which students met the high-ACE cutoff.

Recruitment of Participants

Students who will qualify as high-ACE (n = 40) will be privately contacted and invited to participate in the full assessment. Each student will receive a brief explanation of the study's aims, the tests to be administered, and the estimated time required. Only those who will provide the written informed consent will proceed to testing.

Testing Session

Testing will be conducted in a quiet room to ensure standardization. Participants who will complete the Wisconsin Card Sorting Test (WCST) will be followed by the Brief Resilience Scale (BRS). Standard instructions for each test will be used, consistent with the administration guidelines. Only the WCST perseverative errors index will be recorded and will be used for analysis.

Data Management

All responses will be encoded in a limited-access digital file. After data encoding, the dataset will be prepared for statistical analysis.

Data analysis

The collected data will be analyzed using SPSS software. Descriptive statistics, including mean, standard deviation, and range, will be computed to summarize participants' ACE scores, executive function, perseverative errors, and resilience scores. Data will first be examined for normality using the Shapiro-Wilk test. For normally distributed data, Pearson's correlation coefficient will be used to examine the relationship between executive function and resilience, while for non-normal data, Spearman's rho will be applied. The significance level will be set at $\alpha = 0.05$.

Ethical Considerations

The study adheres to the ethical standards set by the American Psychological Association (APA, 7th edition) and the guidelines of the CEU Graduate School Ethics Committee. The following principles will be strictly observed:

Informed Consent

Participants will be fully informed about the study's purpose, procedures, potential risks, and their right to withdraw at any time without penalty. Only students who will voluntarily sign the consent form will be included in the dataset.

Confidentiality and Anonymity

To protect privacy, no personal identifiers (names, contact details, or sensitive personal information) will be linked to the test results. All data will be coded. Electronic files are accessible only to the researchers.

Reporting of results will have aggregated data to prevent identification of individual participants.

Sensitive Content and Psychological Risk

Because the ACE Questionnaire involves sensitive childhood experiences, participants will be reminded that they can skip any item that caused discomfort. A licensed guidance counselor is available on standby during the screening phase. Students who will exhibit visible emotional distress will be provided with immediate support and offered referral to the school's counseling office.

Voluntary Participation and Right to Withdraw

At any point during screening or testing, participants can withdraw without explanation and without losing any academic standing or benefits. No incentives are provided to avoid coercion.

Data Integrity and Responsible Use

Data will be used solely for academic research. The researchers commit not to disclose individual results to faculty, administrators, or peers. All materials will be retained securely for a limited period and then permanently deleted following institutional research guidelines.

Non-Maleficence and Beneficence

Utmost care will be taken into consideration to ensure that participation will not harm students.

The study is designed to contribute positively by identifying factors affecting resilience in high ACE students, which may inform trauma-informed interventions. Participants may contact the registered psychologists and psychometricians conducting the study if there are emergencies or unforeseen event that needs attention.

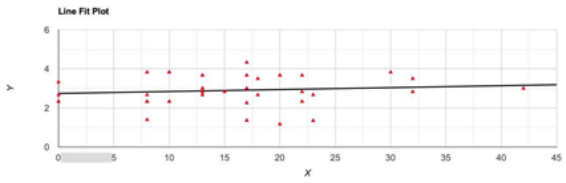
Ethics Approval

The research proposal was reviewed and approved by the CEU Graduate School Research Ethics Committee prior to data collection.

Results

Parameter	Value
Pearson correlation coefficient (r)	0.1168
r^2	0.01365
P-value	0.4787
Covariance	0.8227
Sample size (n)	39
Statistic	0.7156

Results of the Pearson correlation indicated that there is a non significant small positive relationship between X and Y, (r(37) = .117, p = .479). r = 0.1168.



Calculation

$$\bar{x} = \frac{17+8+\dots+8+17}{39} = 15.5128$$

$$\bar{y} = \frac{2.26+1.4+\dots+3.83+4.33}{39} = 2.8979$$

$$\Sigma(x_i - \bar{x})^2 = (17-15.51)^2+(8-15.51)^2+\dots+(8-15.51)^2+(17-15.51)^2 = 3157.7436$$

$$\Sigma(y_i - \bar{y})^2 = (2.26-2.9)^2+(1.4-2.9)^2+\dots+(3.83-2.9)^2+(4.33-2.9)^2 = 22.6716$$

$$\Sigma(x_i - \bar{x})(y_i - \bar{y}) = (17-15.51)*(2.26-2.9)+(8-15.51)*(1.4-2.9)+\dots+(8-15.51)*(3.83-2.9)+(17-15.51)*(4.33-2.9) = 31.261$$

$$S_{XY} = \frac{\Sigma(x_i - \bar{x})(y_i - \bar{y})}{n - 1}$$

$$S_{XY} = \frac{31.261}{39 - 1} = 0.8227$$

$$r = \frac{\Sigma(x_i - \bar{x})(y_i - \bar{y})}{\sqrt{(\Sigma(x_i - \bar{x})^2 \Sigma(y_i - \bar{y})^2)}}$$

$$r = \frac{31.261}{\sqrt{(3157.7436*22.6716)}} = \mathbf{0.1168}$$

Alternativly

$$r = \frac{S_{XY}}{S_X S_Y}$$

$$r = \frac{0.8227}{9.1158*0.7724} = \mathbf{0.1168}$$

x - x̄	y - ȳ	(x - x̄)²	(y - ȳ)²	(x - x̄)(y - ȳ)
1.4872	-0.6379	2.2117	2.2117	-0.9487
-7.5128	-1.4979	56.4425	56.4425	11.2538
7.4872	-1.5479	56.0579	56.0579	-11.5898
1.4872	-1.5379	2.2117	2.2117	-2.2872
1.4872	0.7721	2.2117	2.2117	1.1482
-15.5128	0.4321	240.6476	240.6476	-6.7023
-2.5128	0.7721	6.3143	6.3143	-1.94
26.4872	0.1021	701.5707	701.5707	2.7031
-15.5128	-0.2279	240.6476	240.6476	3.5361
-15.5128	-0.5679	240.6476	240.6476	8.8105
6.4872	-0.5679	42.0835	42.0835	-3.6844
2.4872	0.6021	6.1861	6.1861	1.4974
6.4872	-0.06795	42.0835	42.0835	-0.4408
-5.5128	0.9321	30.3912	30.3912	-5.1382
2.4872	-0.2279	6.1861	6.1861	-0.5669
6.4872	0.7721	42.0835	42.0835	5.0084
-7.5128	-0.5679	56.4425	56.4425	4.2669
-15.5128	-0.5679	240.6476	240.6476	8.8105
7.4872	-0.2279	56.0579	56.0579	-1.7067
16.4872	-0.06795	271.8271	271.8271	-1.1203
4.4872	0.7721	20.1348	20.1348	3.4643
-0.5128	-0.06795	0.263	0.263	0.03485
-2.5128	0.1021	6.3143	6.3143	-0.2564
14.4872	0.9321	209.8784	209.8784	13.5028
-2.5128	-0.06795	6.3143	6.3143	0.1707
16.4872	0.6021	271.8271	271.8271	9.9261
-5.5128	0.9321	30.3912	30.3912	-5.1382
-7.5128	-0.5679	56.4425	56.4425	4.2669
-2.5128	0.1021	6.3143	6.3143	-0.2564
4.4872	0.7721	20.1348	20.1348	3.4643
-7.5128	-0.2279	56.4425	56.4425	1.7125
-2.5128	-0.06795	6.3143	6.3143	0.1707
1.4872	0.1021	2.2117	2.2117	0.1518
-5.5128	-0.5679	30.3912	30.3912	3.131
-2.5128	-0.2279	6.3143	6.3143	0.5728
4.4872	-1.7279	20.1348	20.1348	-7.7536
-2.5128	0.7721	6.3143	6.3143	-1.94
-7.5128	0.9321	56.4425	56.4425	-7.0023
1.4872	1.4321	2.2117	2.2117	2.1297
0	0	**3157.7436** (SS_x)	**22.6716** (SS_y)	**31.261** (SP_{xy})

Test calculation

$$S = \sqrt{\left(\frac{1 - r^2}{n - 2}\right)}$$

$$S = \sqrt{\left(\frac{1 - 0.1168^2}{39 - 2}\right)} = 0.1633$$

$$stat = \frac{r - 0}{S}$$

$$stat = \frac{0.1168 - 0}{0.1633} = 0.7156$$

$$p = p(x \le 0.7156) = 0.7606$$

$$p\text{-value} = 2 * Min(p, 1 - p) = 2 * Min(0.7606, 0.2394) = 0.4787$$

Correlation-test, using T(df:37) distribution (two-tailed)
Since the null correlation is zero, we use the t-distribution to test the correlation.

The correlation's distribution is not symmetrical when r ≠ 0, hence we use the Z distribution over Fisher transformation to create the confidence interval.

H_0 hypothesis
Since the p-value > α, H 0 can not be rejected.

The population's correlation is considered to be equal to the expected correlation (0). In other words, the difference between the sample correlation and the expected correlation is not big enough to be statistically significant.

A non-significance result can not prove that H 0 is correct, only that the null assumption can not be rejected.

P-value

The p-value equals 0.4787, (P(x≤0.7156) = 0.7606). It means that the chance of type I error, rejecting a correct H0 , is too high: 0.4787 (47.87%).

p = .4787, which exceeded the .05 threshold.

Test statistic

The test statistic T equals 0.7156, which is in the 95% region of acceptance: [-2.0262, 2.0262].

The correlation (0.1168), is in the 95% region of acceptance: [-0.316, 0.316]. The 95% confidence interval of correlation is: [-0.2063, 0.417].

A Pearson correlation analysis was conducted to examine the relationship between executive function and resilience among students with high adverse childhood experiences (ACEs). The results indicated a weak positive correlation between executive function and resilience (r = 0.1168). However, this relationship was not statistically significant, t(37) = 0.7156, p = .4787.

The 95% confidence interval for the correlation ranged from −0.2063 to 0.417, indicating that the true population correlation may include zero. Because the p-value exceeded the conventional significance level of α = .05, the null hypothesis was not rejected. These findings suggest that executive function was not significantly associated with resilience in the present sample.

Discussion

The present study examined the relationship between executive function and resilience among students with high levels of adverse childhood experiences (ACEs). Contrary to expectations based on existing literature, the results indicated that executive function was not significantly associated with resilience within the sample.

Although a positive correlation was observed, the relationship was weak and statistically non-significant.

Previous research has suggested that executive functioning plays an important role in adaptive coping and emotional regulation, both of which are key components of resilience [4,5]. Individuals with stronger executive control are typically better able to manage stress, regulate behavior, and engage in goal-directed problem solving. In the context of childhood adversity, executive function has been proposed as a protective cognitive mechanism that may support positive adaptation [3,7]. However, the present findings do not provide empirical support for a direct relationship between these constructs among the participants in this study.

Several factors may explain the absence of a statistically significant relationship. First, resilience is a multidimensional construct influenced by a wide range of factors beyond cognitive functioning, including social support, environmental stability, and psychological resources [6]. It is possible that these variables played a more prominent role in shaping resilience outcomes among the students in this sample.

Second, the relatively small sample size may have limited the statistical power of the analysis, reducing the ability to detect a meaningful association. Small samples can increase the likelihood of Type II errors, particularly when the true relationship between variables is modest in magnitude.

Third, the heterogeneity of adverse childhood experiences among participants may have influenced the findings. Not all ACEs have the same psychological impact, and individuals may differ in how they process and adapt to adversity. Some students may have developed resilience through protective factors unrelated to executive functioning, such as supportive relationships or positive school environments.

Another possible explanation is that the relationship between executive function and resilience may be indirect rather than linear. Executive functioning may influence resilience through mediating variables such as emotional regulation, coping strategies, or academic self-efficacy. Future research should explore these potential pathways using more complex analytic models.

Despite the non-significant findings, this study contributes to the growing body of research examining cognitive and psychological adaptation among students with adverse childhood experiences. The results highlight the importance of considering resilience as a multifaceted construct and suggest that executive function alone may not fully explain adaptive outcomes among individuals exposed to early adversity.

Conclusion

This study investigated the relationship between executive function and resilience among students with high adverse childhood experiences. The findings revealed a weak but nonsignificant association between the two variables, suggesting that executive functioning may not independently predict resilience within this population. These results underscore the complexity of resilience and indicate that multiple cognitive, psychological, and environmental factors likely contribute to adaptive outcomes among individuals with ACEs. Future research should examine broader models of resilience that incorporate mediating and moderating variables, as well as larger and more diverse samples.

References

1. Felitti VJ, Anda RF, Nordenberg D, Williamson DF, Spitz AM, et al. Relationship of childhood abuse and household dysfunction. Am J Prev Med. 1998; 14(4): 245-258.
2. Hughes K, Bellis MA, Hardcastle KA, Sethi D, Butchart A, et al. The effect of multiple adverse childhood experiences on health. Lancet Public Health. 2017; 2(8): 356-366.
3. McLaughlin KA, Weissman D, Bitrán D. Childhood adversity and neural development. Annu Rev Dev Psychol. 2019; 1: 277-312.
4. Diamond A. Executive functions. Annual Review of Psychology. 2013; 64: 135-168.
5. Zelazo PD, Carlson SM. The neurodevelopment of executive function skills: Implications for academic achievement gaps. Child Dev Perspect. 2020.
6. Masten A. Ordinary magic: Resilience in development. 2014.
7. Narayan AJ, Doom JR, Seok D, Fox KR. Resilience after childhood adversity. Advers Resil Sci. 2021; 2: 193-204.
8. Ursache A, Blair C, Raver CC. The promotion of self-regulation as a means of enhancing school readiness and early achievement in children at risk for school failure. Child Dev Perspect. 2012; 14(1): 34-40.
9. Masten AS, Motti-Stefanidi F. Multisystem resilience for children and youth in disaster: Reflections in the context of COVID-19. Advers Resil Sci. 2020; 1(2): 95-106.
10. Kim-Spoon J, Deater-Deckard K, Holmes C, Lee J, Chiu PH. Executive function and emotional regulation in adolescence: Links to resilience and adjustment following stress exposure. Dev Psychopathol. 2021; 33(4): 1463-1475.
11. Panter-Brick C, Leckman JF. Resilience in child development—Interconnected pathways to wellbeing. Annu Rev Psychol. 2021; 72: 673-700.
12. Howard S, Fogarty GJ. The role of resilience in the academic and psychological adjustment of university students. J Am Coll Health. 2021; 69(6): 652-660.