Adversarial Childhood Experiences, Cognitive Functioning, Depression, and Anxiety in Adulthood

Hanaan Bing-Canar[1,2], Humza Khan[1], Jane K. Stocks[1], Franchezka Lapitan-Moore[1], Matthew S. Phillips[1], Andrew Rauch[1], Max Obolsky[1], Brian M. Cerny[1], Jason R. Soble[1], Kyle J. Jennette[1], & Zachary J. Resch[1]

[1]University of Illinois at Chicago Medical Center, [2]University of Illinois at Chicago Department of Psychology

Introduction

- Early life experiences, particularly those that are negative and/or stressful in nature, have been increasingly recognized as an important factor in both mental and physical health outcomes later in life.
- Evidence suggests that adverse childhood experiences (ACEs) in particular, predict neurocognitive dysfunction, possibly through direct (e.g., brain structure/function changes) and indirect (e.g., increased psychopathology risk) pathways.
- Extant studies examining the relationship between ACEs and cognition have focused on young and older adults, with limited understanding as to how ACEs affect cognitive health in mid-adulthood.

Purpose: Compare psychiatric and cognitive differences between adults at high- and low-risk of adverse health outcomes based on the ACE classification scheme.

Participants & Methods

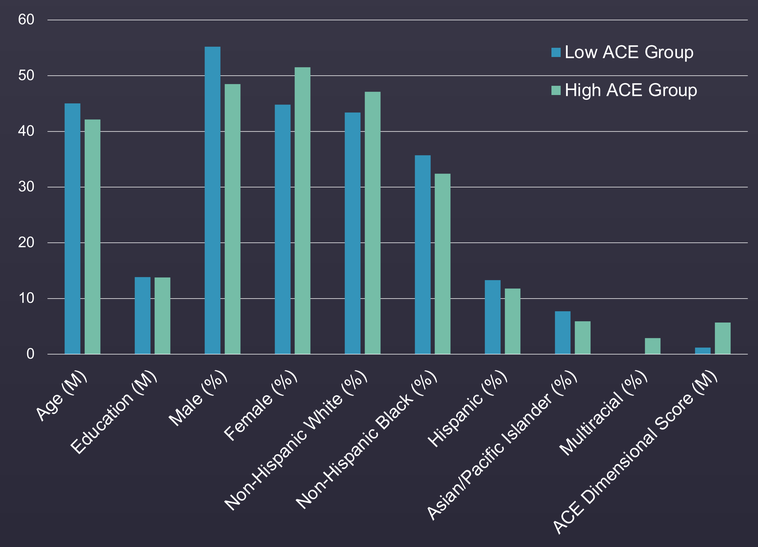
Participants

- 211 adult outpatients consecutively referred for neuropsychological evaluation to inform differential diagnosis, treatment/rehabilitation planning, or presurgical workup at a large, Midwest academic medical center. See Figure 1 for participant characteristics.
- All patients were administered the following measures, Adverse Childhood Experiences Questionnaire (ACE), Test of Premorbid Functioning (TOPF), Wechsler Adult Intelligence Scale-4th Edition Digit Span Test (WAIS-IV DS), Trail Making Test-Part A & B (TMT-A; TMT-B), Rey Auditory Verbal Learning Test (RAVLT), Beck Anxiety Inventory (BAI), and Beck Depression Inventory-2nd Edition (BDI-II) as a part of a larger, standardized neurocognitive battery.

Method

- Patients were divided into high (i.e., 4 or more ACEs) and low (i.e., 3 or fewer ACEs) ACE groups based on the number of ACEs endorsed.
- A series of one-way analysis of variances were conducted to compare high vs. low ACE groups on TOPF, WAIS-IV DS, TMT-A, TMT-B, RAVLT Learning and Recall, BAI, and BDI-II scores.

Figure 1. Participant Characteristics



Results

- High and low ACE groups did not significantly differ on relevant demographic variables, including age (t(144) = 1.19, p = .235), education (t(150) = 0.11, p = .914), sex ($\chi^2(1) = 0.83$, p=.361) or race/ethnicity ($\chi^2(5) = 4.79$, p = .442).
- Significant group differences were detected for BAI and BDI-II scores, such that the high ACE group endorsed significantly greater depression and anxiety symptoms relative to the low ACE group. See Table 1.
- High and low ACE groups did not significantly differ on TOPF, WAIS-IV DS, TMT-A, TMT-B, (or RAVLT scores, *p*'s>.05. See Table 2.

Table 1. Analysis of Variance Models Comparing High and Low ACE Groups on Psychiatric Symptom Endorsement

Measure	Low ACE Group		High ACE Group		*df*	*F*	*p*	η_p^2
	M	*SD*	*M*	*SD*				
BAI	11.07	10.29	18.37	10.53	1, 165	18.45	<.001	.102
BDI-II	15.25	12.32	24.23	12.71	1, 159	18.38	<.001	.105

Table 2. Analysis of Variance Models Comparing High and Low ACE Groups on Neuropsychological Test Performance

Measure	Low ACE Group		High ACE Group		*df*	*F*	*p*	η_p^2
	M	*SD*	*M*	*SD*				
TOPF Word Reading SS	100.28	15.67	101.21	16.56	1, 160	0.13	.724	.001
Digit Span ss	8.75	3.55	9.10	3.71	1, 169	0.36	.552	.002
TMT-A T	45.15	13.00	43.20	13.33	1, 169	0.84	.360	.005
TMT-B T	45.38	10.94	45.13	11.18	1, 143	0.02	.898	.000
RAVLT Learning T	44.65	15.54	42.84	12.64	1, 101	0.37	.546	.004
RAVLT Delay T	46.44	14.47	47.24	12.62	1, 101	0.08	.780	.001

Discussion

- Results indicated that individuals at high risk of adverse health outcomes based on the ACE classification scheme endorsed greater symptoms of depression and anxiety compared to those at low risk.
- In contrast, results did not support group differences between those at high and low risk for adverse health outcomes based on the ACE classification scheme on measures spanning cognitive domains of premorbid functioning, attention/working memory, processing speed, executive functioning, and verbal learning and memory.
- Including ACE measures in comprehensive neuropsychological evaluations will aid in case conceptualization and help clinicians create and tailor treatment recommendations.
- Results suggest that clinicians must remain mindful of early-life contextual developmental factors when assessing and diagnosing psychological dysfunction in routine practice.
- Given the lack of ACE group differences in cognition, future research may examine whether environmental, sociodemographic, and/or health-related variables not assessed in the present study serve to mediate or moderate pathways by which ACE exposure impacts cognition in middle adulthood.