

# Childhood Corporal Punishment in Bahamian College Students: Association with Executive Functions, Mood, Sensitivity to Reward and Punishment, Openness to Experience, and Creativity

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## Abstract

Corporal punishment (CP) of children remains a common means of punishment in Caribbean families despite increasing evidence of long-term negative repercussions. We evaluated whether college students with and without a history of childhood CP differed with respect to self-rated executive functions (EF), mood, sensitivity to reward/punishment, openness to experiences, and creativity. Participants were 454 students at University of The Bahamas. They completed an anonymous online survey that included the Discipline Questionnaire, Behavior Rating Inventory of Executive Function – Adult, Depression Anxiety Stress Scale-21, Sensitivity to Reward and Sensitivity to Punishment Questionnaire, NEO-FFI-3 Openness scale, and Runco Ideational Behavior Scale - Short Form. A total of 84.8% received CP, more commonly in childhood (80.6%) than adolescence (53.1%). Overall, those who received CP endorsed worse EF and more emotional distress. CP during childhood (ages 5-12) was related to worse depression and aspects of EF. CP during adolescence was associated with more anxiety, depression, and stress, greater difficulty with all aspects of EFs, as well as lower sensitivity to reward or punishment. More severe CP was related to greater self-rated creativity and openness. CP during childhood, and especially adolescence, is associated with adverse effects in college students including their emotional and executive functioning, as well as responsiveness to motivational stimuli. Greater creativity and openness may reflect a means to cope with a history of CP. These findings, coupled with other research, indicate that the current tolerance of CP in The Bahamas is unfounded and policies should be changed accordingly.

## Introduction

The use of corporal punishment (CP) remains prevalent in many regions of the world, including Caribbean nations such as The Bahamas and Jamaica (Dede Yildirim & Roopnarine, 2019; Fielding & Ballance, 2020; Samms-Vaughan et al., 2024). In The Bahamas, use of CP is associated with its history of slavery and the influence of supernatural belief (Fielding & Ballance, 2022), and is permitted within the home and schools, being only restricted in use on those under age six years (Fielding & Ballance, 2020). Historically, CP in Bahamian schools was considered an important means to impose discipline in the classroom and even instill fear (Fielding & Ballance, 2020). It continues to be common within schools in The Bahamas and internationally, despite CP in schools being restricted in numerous countries worldwide (Fielding et al., 2016; Gershoff, 2017; Heekes et al., 2022).

Use of CP in homes is not restricted to any socioeconomic group, and what is considered as abuse arising from CP might be considered as grievous bodily harm outside of The Bahamas (Brennen et al., 2010). The knowledge and practices of parents likely reflect negative parenting practices and limited knowledge of the long-term detrimental outcomes associated with CP (Fielding & Ballance, 2021). Such attitudes and negative outcomes are not confined to The Bahamas. For example, in Jamaica, negative parenting practices, including CP, have been linked to violence (Smith & Mosby, 2003).

### *Outcomes of Childhood Corporal Punishment in Children and Adolescents*

Parental CP has been shown to be associated with a variety of negative outcomes in

children (Gershoff et al., 2018). Children who experience parental CP are more likely to have externalising behaviours such as aggression and conduct problems (Norman et al., 2012; Wiggers & Paas, 2022), as well as substance use (Norman et al., 2012). They are at higher risk for internalising problems such as anxiety and depression (Liu et al., 2022; Norman et al., 2012), and suicide attempts (Norman et al., 2012). CP in adolescence itself has been associated in later life with depressive symptoms, suicidal ideation, alcohol abuse, as well as physical aggression towards their own children and spouse (Straus & Donnelly, 1993; Straus & Kantor, 1994; Straus & Stewart, 1999). Functioning at school is affected, such as poorer grades, peer isolation, and behavioural problems (Amato & Fowler, 2002; Wiggers & Paas, 2022). CP in schools per se has negative repercussions, with a recent meta-analysis finding increased externalising and internalising behaviours, as well as worse school performance (Visser et al., 2022). Importantly, a recent systematic review and meta-analysis demonstrated that such adverse effects of CP are present not only in studies conducted within high-income countries, where the majority of such research has historically been carried out, but also generalised to low- and middle-income countries (Cuartas et al., 2025).

More recently, adverse effects of CP on children's cognitive functioning have been observed. Several studies in China have linked parental CP to poorer executive functions (EF), such as cognitive flexibility and inhibitory control, in children (Kang & Rodriguez, 2023; Li et al., 2023; Liu et al., 2022). Furthermore, the integrity of EF was found to mediate the relationship between parental CP and externalising behaviours in Chinese preschool children (Xing et al.,

2018). In a school setting, a study in West Africa found worse EF in grade 1 children who attended a punitive rather than non-punitive school (Victoria Talwar et al., 2011).

Furthermore, adolescents with a history of CP were found to show enhanced neural response to errors and decreased response to monetary rewards during performance of a cognitive task (Burani et al., 2023). Interestingly, enhanced brain response to errors was also seen in children when they made mistakes in the presence of a controlling parent, suggesting increased risk for anxiety (Meyer et al., 2019). Other work has observed that negative parenting practices (including CP) are associated with lower sensitivity to reward in children, as measured using the Sensitivity to Punishment/Reward Responsivity Questionnaire for Children (Li, 2018). Such findings suggest that CP in children may result in changes in the brain's responsiveness to rewards and errors, as well as the potential consequences of errors. Such abnormalities have previously been associated with heightened risk for depression (Eshel & Roiser, 2010).

### *Outcomes of Childhood Corporal Punishment in The Bahamas*

Research on the consequences of CP in Bahamian children is sparse. Childhood CP has been related to more frequent anger outbursts in Bahamian than American children (Fielding et al., 2015). Among adults in The Bahamas, parent-administered CP during childhood is associated with increased self-reported aggression (Moxey-Adderley & Fielding, 2024), and those with higher aggression are more likely to inflict CP on their own children than those with lower aggression. Despite such findings, support for the use of CP on children, and

opposition to making it illegal, remains high among Bahamian parents (Fielding & Ballance, 2021).

### *Outcomes of Childhood Corporal Punishment in College Students*

Despite a wealth of research on the impact of CP on children and adolescents, there is a dearth of empirical work on the long-term effects of childhood CP on college students. In college students, CP in childhood has been associated with later cyberbullying (Sun et al., 2023) and aggression (Bryan & Freed, 1982; King et al., 2018). It has also been related to poorer grades, antisocial traits, delinquency, anxiety, depression, and worse overall psychological adjustment (Bryan & Freed, 1982; Chong & Yeo, 2018; Gámez-Guadix et al., 2010; Turner & Muller, 2004). These findings raise significant concern with respect to the potential long-term harmful effects of CP in college students as well as emerging adults (i.e. individuals aged between 18 and 25 years) more generally.

### *Theoretical Models for Negative Outcomes of Childhood Corporal Punishment*

Several theoretical models have been proposed to account for the negative effects of CP on children and adolescents, such as social learning, social-information processing, and attachment theories. Based on such theories, CP may provide a model for the child on how they should react to other's behaviours and problem solve, creates an expectation or normalisation of physically aggressive behaviour, and produces fear that in turn contributes to the development of an insecure attachment between the child and parent (Cuartas, 2023; Gershoff, 2010). Over time, this may result in socio-emotional problems, reflected in

externalising and internalising behaviours such as depression, anxiety, and antisocial behaviours (Cuartas, 2023; Gershoff, 2002). From a neurobiological perspective, alterations in dopaminergic systems (Sheu et al., 2010) and prefrontal cortex (Tomoda et al., 2009) in those exposed to childhood CP may result in abnormal sensitivity to cues signalling potential reward or punishment, which has in turn been associated with emotional and behavioural problems (e.g., (Cardoso Melo et al., 2022; Katz et al., 2020). Similarly, inadequate development of self-regulatory abilities, as manifested by difficulties with executive functioning, could be a consequence of the abnormal development of such prefrontal-subcortical brain systems due to exposure to CP.

One or more of such mechanisms may continue to play a role in propagating the adverse effects of CP into emerging adulthood, especially given the importance of this developmental period for the establishment of self-identity, exploration of possible directions for one's life (e.g., belief systems, interpersonal relationships, career paths), as well as mental health and brain development (Arnett, 2000; Sowell et al., 1999). Indeed, given that CP is associated with worse developmental outcomes in early childhood, childhood, as well as adolescence, it would be reasonable to expect negative outcomes of CP to extend into emerging adulthood.

### *The Present Study*

The present study investigated, in Bahamian college students, the effects of parental CP in childhood on self-rated executive functioning, mood, as well as sensitivity to reward and punishment. In addition, we explored whether CP has an adverse effect on creativity and the personality trait of openness to experiences, given some prior

research indicating that CP hinders student creativity (Naz et al., 2011), and child maltreatment (though not specific to CP) is associated with lower openness to experiences (Hengartner et al., 2015; Rogosch & Cicchetti, 2004). We predicted that college students exposed to childhood CP would endorse greater current difficulty with executive functioning, poorer mood, decreased sensitivity to reward but heightened sensitivity to punishment, as well as reduced creativity and openness. In addition, as there is a wealth of evidence indicating that adolescence is a unique developmental period (Jaworska & MacQueen, 2015), including for vital abilities such as EFs (Tervo-Clemmens et al., 2023), we explored whether CP in childhood versus adolescence had differential effects on study outcome measures.

## **Methods**

### *Participants*

Participants were 526 students recruited at University of The Bahamas between March and April 2018. This was from a student population of about 4,500 students. Inclusion criteria was being 18 years of age or older and a current student at the university. Recruitment was conducted through the cooperation of instructors who allowed students to complete the hour-long survey during class time. The study was approved by the IRBs of Dartmouth-Hitchcock and University of The Bahamas.

### *Procedures*

Participants completed an anonymous online survey via the REDCap electronic data capture tools hosted at Dartmouth College. REDCap (Research Electronic Data Capture) is a secure, web-based software

platform designed to support data capture for research studies (Harris et al., 2009). Students could, however, provide their name and email address to enter a lottery in which six prizes of 50 Bahamian dollars were drawn. Names and email addresses were shunted to a separate database via REDCap to maintain anonymity of responses to the survey.

### *Measures:*

**Participant Characteristics:** A brief questionnaire asked about age, gender, history of mental health conditions, and current medications.

**Corporal Punishment:** The Discipline Questionnaire (DQ) is a 22-item self-report measure that asks about personal childhood experience of CP and evaluation of past punishment (Graziano & Namaste, 1990) (Graziano et al., 1992). Items were recoded such that higher scores reflect more frequent or severe punishment, or more negative evaluation of punishment. The DQ yields two summary scales: Physical Punishment (PP) Scale, reflecting frequency and severity of past CP; and Evaluation of Physical Punishment (EPP) Scale, reflecting attitudes towards the CP received (e.g., how justified, how much resentment felt). Retrospective ratings of the severity and frequency of CP were provided for ages 5 to 17 years, as well as separately for ages 5 to 12 years and 13 to 17 years of age. The measure also included questions pertaining to the perpetrator of corporal punishment, including their behaviour during punishment, as well as the typical kinds of punishment employed.

**Mood:** The Depression Anxiety Stress Scale (DASS-21) is a 21-item self-report questionnaire assessing distress as reflected by depression, anxiety, and stress. (Antony et al., 1998). Items are rated on a 4-point

scale ranging from 0 (*Did not apply to me at all*) to 3 (*Applied to me very much, or most of the time*). The total DASS-21 score ranges from 0 to 63, with higher scores reflecting greater distress. Internal consistency (Cronbach's alpha) of the DASS-21 in our sample of Bahamian college students was good to excellent overall (.928) as well as the Depression (.881), Anxiety (.804), and Stress (.831) scales.

**Sensitivity to Reward and Punishment:** The Sensitivity to Punishment and Sensitivity to Reward Questionnaire (SPSRQ) is a 48-item scale, using a yes/no format, assessing a person's typical response to cues or situations that may be considered rewarding (e.g., money, social praise, preference for more immediate rewards) or punishing (e.g., avoiding embarrassment, worry about something one said or did, fear of novelty) (Torrubia et al., 2001). Higher scores reflect greater sensitivity. In our sample, internal consistency (Cronbach's alpha) of the SPSRQ Punishment (.847) and Reward (.770) scales was good and acceptable, respectively.

**Executive Functions:** Executive functions are a set of interrelated control processes involved in the initiation, execution, monitoring, and inhibition of cognition, behaviour, and emotion (Stuss & Alexander, 2000). The Behavior Rating Inventory of Executive Function-Adult version (BRIEF-A) is a 75-item questionnaire designed to assess subjective executive functions as manifested in everyday life over the past month. (Roth et al., 2005). Items are rated on a 3-point scale (*Never, Sometimes, Often*), with higher score reflecting worse executive functioning. Mean scores were examined for the nine clinical scales, two index scores (Behavior Regulation Index [BRI] and Metacognition Index [MI]), and the overall General Executive Composite

(GEC). In our Bahamian college student sample, internal consistency (Cronbach's alpha) of the BRIEF-A was excellent for the GEC (.954), BRI (.910), and MI (.934). Individual scales had acceptable to good reliability: Inhibit (.709), Shift (.717), Emotional Control (.884), Self Monitor (.726), Initiate (.741), Working Memory (.782), Plan/Organize (.816), and Organizational of Materials (.813), with Task Monitor having the lowest (.634).

**Creativity:** Runco Ideational Behavior Scale: Short Form (RIBS-S) (Runco et al., 2001; Runco et al., 2014): This 19-item measure was designed to assess the frequency with which a person generates creative or novel ideas such as during writing or accomplishing tasks. Items are rated on a 5-point Likert scale ranging from 1 (*Never*) to 5 (*Just about every day, and sometimes more than once each day*). Higher scores reflect greater creativity. Internal consistency (Cronbach's alpha) of the RIBS-S in our sample was good (.817).

**Openness:** Openness to experience is a personality trait reflecting an individual's seeking or receptiveness to new experiences (e.g., emotions, ideas, actions) and engagement in creative and intellectual activities (McCrae & Sutin, 2009). NEO Five-Factor Inventory-3 (NEO-FFI-3) Openness Scale assesses the extent to which a person considers themselves open to new experiences (McCrae & Costa Jr., 2007). Internal consistency (Cronbach's alpha) of this scale in our sample was low (.488).

## Analyses

Descriptive statistics are provided for characteristics of CP, as assessed using the DQ, in the overall sample. Students who reported having never received CP (N-CP) were compared to those who reported

receiving any CP (A-CP). We examined the effects of CP that occurred from 5 to 17 years of age, as well as separately during childhood (ages 5 to 12) and adolescence (ages 13 to 17). ANOVA was employed to compare groups (N-CP vs. A-CP) on the DASS-21, SPSRQ, Openness scale, and RIBS-S. MANOVA was conducted to compare groups on the BRIEF-A indexes and scales.

Significance was considered at  $p < .05$ . The effect size partial eta-squared ( $\eta_p^2$ ) was also reported, with  $\eta_p^2 = 0.01$ ,  $\eta_p^2 = 0.06$ , and  $\eta_p^2 = 0.14$  indicating small, medium, and large effects, respectively. It should be noted that, as not all of 454 students with useable DQ data completed all dependent measures, samples sizes for various analyses differed to some extent. All analyses were conducted using IBM SPSS Statistics 24.

## Results

### *Participant Characteristics*

Of the 526 students who began the online survey, 72 (13.69%) were excluded because they did not complete all or part of the DQ, leaving 454 for analyses. One participant did not provide their age and one was missing a response for the extent to which objects were used in punishment, for which the respective sample means were imputed. Table 1 presents participant characteristics. The sample had a mean age of 21.5 years, the majority being in their 20s, and were mostly women. Mean current annual family income was in the B\$10,001-20,000 range, well below the 25th percentile within The Bahamas. During childhood, the majority (53.1%) lived with their parents, with most others living with at least one parent (33.9%). Few reported having ever been formally diagnosed with a mental health condition.

**Table 1**  
*Participant Characteristics (N = 454)*

	Mean	SD	Range
Age, years	21.53	4.13	18-53
	%		
Gender, % women	78.9		
Family annual income, BSD:			
\$0-10,000	18.7		
\$10,001 – 20,000	14.1		
\$20,001 – 40,000	20.9		
\$40,001 – 60,000	12.6		
\$60,001 – 80,000	4.2		
\$80,001 +	3.3		
Don't know	26.2		
Lived with during childhood:			
Parents	53.1		
Mother only	33.0		
Father only	0.9		
Mother and stepfather	5.7		
Father and stepmother	0.4		
Other relative	5.1		
Other	1.8		
Mental Health Condition:			
Any	6.6		
Depression	2.4		
Anxiety	2.2		
ADHD	0.4		
PTSD	0.2		
ASD	0.2		
Others	2.2		

Note: BSD = Bahamian Dollar; ADHD = Attention Deficit Hyperactivity Disorder; ASD = Autism Spectrum Disorder; PTSD = Post-Traumatic Stress Disorder.

### *Characteristics of Corporal Punishment in Childhood*

Table 2 presents data pertaining to student's experience of CP received in childhood. Overall, 84.8% reported having received any CP, with the rate being higher in childhood (80.6%) than in adolescence (53.1%). The severity of CP varied widely, but tended to be mild in adolescence. The majority

received CP from their mother (79.7%) or father (41.9%). The most common forms of CP were spanking (81.9%), whipping (52.4%), pinching (49.1%), and slapping (42.5%). The students rated the perpetrator of CP, during the punishment, as being moderately angry, and to lesser extent hateful or out of control.

**Table 2**  
*Characteristics of Corporal Punishment Received in Childhood (N = 454)*

	N	%
Frequency of Corporal Punishment:		
Overall (age 5-17):		
Never	35	7.7
A few times a year	188	41.4
A few times a month	123	27.1
A few times a week	68	15.0
Daily	6	1.3
Don't know	34	7.5
Age 5-12:		
Never	40	8.8
A few times a year	179	39.4
A few times a month	119	26.2
A few times a week	62	13.7
Daily	6	1.3
Don't know	48	10.6
Age 13-17:		
Never	184	40.5
A few times a year	162	35.7
A few times a month	62	13.7
A few times a week	12	2.6
Daily	5	1.1
Don't know	29	6.4
Severity of Corporal Punishment:		
Age 5-12:		
Never physically punished	41	9.0
Mild pain	111	24.4
Moderate pain	89	19.6
Considerable pain	106	23.3
Welts and bruises	99	21.8
More severe than welts and bruises	8	1.8
Age 13-17		
Never physically punished	183	40.3
Mild pain	94	20.7
Moderate pain	65	14.3
Considerable pain	42	9.3
Welts and bruises	61	13.4
More severe than welts and bruises	9	2.0
Perpetrator (age 5-17):		
Mother	362	79.7
Father	190	41.9
Grandparent	108	23.8
Adult sibling	39	8.6
Stepfather	10	2.2
Stepmother	7	1.5
Other (e.g., aunt)	51	11.2

Type of Corporal Punishment (age 5-17):		
Spanking	372	81.9
Whipping	238	52.4
Pinching	223	49.1
Slapping	193	42.5
Punching	65	14.3
Hair/ear pulling	53	11.7
Shaking	48	10.6
Arm twisting	38	8.4
Kicking	25	5.5
Other	21	4.6
Usual State of Perpetrator:		
	Mean	SD
Angry	3.37	1.51
Hateful	2.87	1.36
Out of control	2.29	1.50
Past Punishment Scale:		
	20.80	8.20

Note: Usual state of perpetrator scores range from 0 to 5 (higher being more negative) and Past Punishment Scale scores range from 0 to 45 (higher score reflecting greater severity).

**Attitude towards Corporal Punishment**

Table 3 presents data pertaining to students' attitudes towards CP they received in childhood. Overall, they viewed the CP as effective on behaviour and in teaching, and

deserved about half the time. They also believed they were punished about the right amount. They also generally rated it as being somewhat justified, though with some subsequent resentment.

**Table 3**

*Attitudes towards Corporal Punishment Received in Childhood (N = 454)*

	Mean	SD
How justified	2.28	1.30
Effective on behaviour	2.24	1.30
Effective in teaching	2.42	1.33
Resentment	3.28	1.56
Deserving	3.09	1.09
How much received	3.11	0.95
Evaluation of Past Punishment Scale:	24.95	8.09

Note: Higher scores reflect a more negative attitude towards punishment. Item level scores range from 1 to 5, while Evaluation of Past Punishment Scale scores range from 0 to 45.

**CP and Family Income**

A subset of 335 students reported current family income. No significant correlation was seen between income and any CP variable (severity, frequency, evaluation). Similarly, no differences were seen when comparing students from families with *Low Income* (N = 149; \$0 - \$20,000) or *Higher Income* (N = 186; > \$20,000). ANOVA was

conducted to assess for an interaction between the person who administered CP the most during childhood and income (low vs higher). As the majority of those who reported on who punished them indicated either their mother (n = 128) or father (n = 46), only those reporting one of their parents as the primary punisher was included in the analyses. Results revealed no significant interaction between income (low vs higher)

and primary punisher (mother or father) on any CP variable.

**CP Across the Age Range**

Table 4 presents descriptive statistics for the DASS-21, SPSRQ, BRIEF-A, RIBS-S, and NEO-FFI-3 Openness scale across the entire sample. For all measures and scales there were a wide range of scores. Overall,

students endorsed slightly more stress than anxiety or depression, as well as somewhat greater sensitivity to reward than punishment. Self-rated executive functioning was relatively comparable across BRIEF-A scales (mean scores ranging from 1.68 to 1.83), though with greatest challenges endorsed for Emotional Control, Initiate, and Task Monitor scales

**Table 4**  
*Mood, Sensitivity to Reward and Punishment, Subjective Executive Function, Creativity, and Openness to Experience in the Overall Sample*

	Mean	SD	Range
DASS-21 (N = 379):			
Anxiety	12.80	9.47	0 - 42
Depression	12.24	10.16	0 - 42
Stress	15.07	9.59	0 - 42
SPSRQ (N = 362):			
Sensitivity to Punishment	10.17	5.44	0 - 23
Sensitivity to Reward	14.02	4.33	0 - 24
BRIEF-A (N = 402 - 407):			
Inhibit	1.71	0.37	1 - 3
Shift	1.78	0.40	1 - 3
Emotional Control	1.83	0.47	1 - 3
Self Monitor	1.68	0.39	1 - 3
Initiate	1.81	0.38	1 - 3
Working Memory	1.78	0.40	1 - 3
Plan/Organize	1.70	0.38	1 - 3
Task Monitor	1.82	0.33	1 - 3
Organization of Materials	1.67	0.42	1 - 3
Behavior Regulation Index	1.76	0.34	1.03 - 3
Metacognition Index	1.75	0.33	1.05 - 2.98
Global Executive Composite	1.75	0.31	1.04 - 2.99
RIBS-S (N = 393):			
Total	41.23	12.47	10 - 76
NEO-FFI-3 (N = 371):			
Openness	26.39	5.03	0 - 48

*Note:* BRIEF-A = Behavior Rating Inventory of Executive Function-Adult (mean raw score; higher score is worse); DASS = Depression, Anxiety, and Stress Scale; NEO-FFI-3 = NEO Five Factor Inventory - 3 (Openness subscale); SPSRQ = Sensitivity to Punishment and Sensitivity to Reward Questionnaire; RIBS-S = Runco Ideational Behavior Scale - Short Form.

Table 5 presents results comparing those who did and did not experience CP between ages 5 and 17. Students who received CP were more depressed and anxious, but not more stressed. There was an overall effect of Group on BRIEF-A indexes [*Wilks' Lambda*

= 7.72 (2,370),  $p = .001$ ,  $\eta_p^2 = .040$ ]. Subsequent ANOVAs indicated that those who received CP endorsed having worse EF as reflected by the GEC and MI, but not BRI. Similarly, the groups differed overall on the nine BRIEF-A scales [*Wilks' Lambda*

= 3.32 (9,363),  $p = .001$ ,  $\eta_p^2 = .076$ ], with subsequent analyses indicating worse functioning with CP for inhibit, initiate, plan/organise, task monitor, and

organisation of materials. The groups did not differ with respect to sensitivity to reward or punishment, creativity, or openness to experience.

**Table 5**

*Outcome measures in those Never Punished versus Punishment of any Frequency across the age range (age 5-17 years).*

	Never Punished		Any Punishment		F	p.	$\eta_p^2$
	Mean	SD	Mean	SD			
DASS: (27 v. 327)							
Stress	13.48	11.13	15.32	9.36	.95	.330	.003
Anxiety	8.30	6.76	13.35	9.61	7.15	.008**	.020
Depression	7.78	9.50	12.78	10.05	6.22	.013*	.017
SPSRQ: (27 v. 312)							
Sensitivity to Punishment	11.81	4.80	10.04	5.44	2.71	.101	.008
Sensitivity to Reward	15.52	2.79	13.92	4.42	3.40	.066	.010
BRIEF-A: (29 v. 344)							
Inhibit	1.52	.38	1.72	.36	8.30	.004**	.022
Shift	1.66	.44	1.79	.38	3.26	.072	.009
Emotional Control	1.80	.49	1.84	.47	0.19	.665	.001
Self Monitor	1.62	.46	1.68	.38	0.57	.452	.002
Initiate	1.56	.40	1.83	.37	13.44	<.001**	.037
Working Memory	1.67	.45	1.79	.38	2.46	.118	.007
Plan/Organize	1.49	.41	1.72	.37	9.60	.002**	.025
Task Monitor	1.62	.42	1.84	.31	12.54	<.001**	.033
Organization of Materials	1.38	.40	1.70	.41	16.01	<.001**	.042
Behavior Regulation Index	1.66	.38	1.77	.32	2.72	.100	.007
Metacognition Index	1.54	.37	1.77	.31	14.16	<.001**	.037
Global Executive Composite	1.59	.36	1.77	.29	9.64	.002**	.025
RIBS-S: (28 v. 337)							
Total	38.93	8.59	41.58	12.73	1.17	.280	.003
NEO-FFI-3: (27 v. 319)							
Openness	25.26	6.39	26.58	4.96	1.68	.195	.005

Note: Sample sizes for each measure are presented in parentheses (Never v. Any) for those who were Never Punished vs received Any Punishment. BRIEF-A = Behavior Rating Inventory of Executive Function-Adult (mean raw score; higher score is worse); DASS = Depression, Anxiety, and Stress Scale; NEO-FFI-3 = NEO Five Factor Inventory – 3 (Openness subscale); SPSRQ = Sensitivity to Punishment and Sensitivity to Reward Questionnaire; RIBS-S = Runco Ideational Behavior Scale – Short Form. \* $p < .05$ , \*\* $p < .01$ .

### *CP in Childhood (5-12 Years of Age)*

Table 6 presents results comparing those who did and did not receive CP between the ages of 5 and 12. There was no overall effect of Group on BRIEF-A when considering CP restricted to childhood [*Wilks' Lambda* = 2.63 (2,359),  $p = .073$ ,  $\eta_p^2 = .014$ ]. Experiencing CP in this age range was

unrelated to the GEC or BRI, but those who received CP were higher on the MI. Similarly, the MANOVA on the nine scales was not significant [*Wilks' Lambda* = 1.28 (9,352),  $p = .248$ ,  $\eta_p^2 = .032$ ]. Examination of individual scales revealed only one significant group difference, indicating that those who received CP had worse organisation of materials. Those who

received CP in childhood also rated themselves as more depressed, but also more open to experiences. No differences were

seen for stress, anxiety, sensitivity to reward and punishment, or creativity.

**Table 6**

*Outcome measures in those Never Punished versus Punishment of any Frequency during Childhood (5-12 years of age).*

	Never Punished		Any Punishment		F	p.	$\eta_p^2$
	Mean	SD	Mean	SD			
DASS: (34 v. 308)							
Stress	14.24	10.95	15.50	9.58	0.51	.476	.001
Anxiety	10.76	8.99	13.26	9.59	2.01	.148	.006
Depression	9.06	9.63	12.71	10.25	3.92	.049*	.011
SPSRQ: (33 v 294)							
Sensitivity to Punishment	11.21	5.11	10.16	5.55	1.08	.300	.003
Sensitivity to Reward	14.97	3.90	13.95	4.39	1.68	.196	.005
BRIEF-A: (36 v 326)							
Inhibit	1.63	.42	1.72	.36	2.46	.118	.007
Shift	1.72	.49	1.79	.38	0.89	.345	.002
Emotional Control	1.83	.53	1.84	.47	0.02	.881	.000
Self Monitor	1.63	.40	1.68	.38	0.75	.388	.002
Initiate	1.71	.46	1.83	.37	3.21	.074	.009
Working Memory	1.73	.43	1.79	.39	0.53	.466	.001
Plan/Organize	1.59	.40	1.72	.38	3.59	.059	.010
Task Monitor	1.73	.44	1.84	.32	3.58	.059	.010
Organization of Materials	1.48	.44	1.70	.42	8.35	.004**	.023
Behavior Regulation Index	1.71	.41	1.77	.34	0.90	.343	.002
Metacognition Index	1.64	.37	1.77	.32	4.75	.030*	.013
Global Executive Composite	1.67	.36	1.77	.30	3.23	.074	.009
RIBS-S: (35 v 319)							
Total	38.29	10.53	41.56	12.55	2.21	.138	.006
NEO-FFI-3: (34 v 301)							
Openness	24.71	6.07	26.62	4.91	4.43	.036*	.013

Note: Sample sizes for each measure are presented in parentheses (Never v. Any) for those who were Never Punished vs received Any Punishment. BRIEF-A = Behavior Rating Inventory of Executive Function-Adult (mean raw score; higher score is worse); DASS = Depression, Anxiety, and Stress Scale; NEO-FFI-3 = NEO Five Factor Inventory – 3 (Openness subscale); SPSRQ = Sensitivity to Punishment and Sensitivity to Reward Questionnaire; RIBS-S = Runco Ideational Behavior Scale – Short Form. \* $p < .05$ , \*\* $p < .01$

### *CP in Adolescence (13-17 Years of Age)*

Table 7 presents results comparing those who did and did not experience CP during adolescence. Those who received CP in adolescence were more stressed, anxious, and depressed. They also endorsed lower sensitivity to both reward and punishment. There was an overall effect of Group on BRIEF-A indexes [*Wilks' Lambda* = 15.08 (2,376),  $p = <.001$ ,  $\eta_p^2 = .074$ ]. Subsequent

ANOVAs indicated that those who received CP endorsed worse EF as reflected by the GEC, MI, and BRI. Similarly, the groups differed overall on the nine BRIEF-A scales [*Wilks' Lambda* = 3.82 (9,369),  $p = <.001$ ,  $\eta_p^2 = .085$ ], with subsequent analyses indicating worse functioning with CP across all nine scales. Those who received CP viewed themselves as more creative, but not more open to experience.

**Table 7**

*Outcome measures in those Never Punished versus Punishment of any Frequency during Adolescence (13-17 years of age)*

	Never Punished		Any Punishment		F	p.	$\eta_p^2$
	Mean	SD	Mean	SD			
DASS: (156 v 203)							
Stress	13.11	9.33	16.59	9.58	11.92	.001**	.032
Anxiety	9.99	8.16	15.16	9.85	28.17	<.001**	.073
Depression	10.06	9.23	13.91	10.56	13.04	<.001**	.035
SPSRQ: (148 v 195)							
Sensitivity to Punishment	11.08	5.14	9.68	5.65	5.41	.021*	.016
Sensitivity to Reward	14.63	3.81	13.68	4.65	4.11	.043*	.012
BRIEF-A: (164 v 215)							
Inhibit	1.60	.34	1.78	.37	22.71	<.001**	.057
Shift	1.69	.38	1.83	.39	14.54	<.001**	.037
Emotional Control	1.71	.48	1.92	.45	19.55	<.001**	.049
Self Monitor	1.57	.37	1.75	.38	20.79	<.001**	.052
Initiate	1.73	.37	1.86	.38	10.43	.001**	.027
Working Memory	1.72	.39	1.82	.40	6.71	.010*	.017
Plan/Organize	1.62	.37	1.75	.38	11.60	.001**	.030
Task Monitor	1.76	.33	1.86	.32	7.76	.006**	.020
Organization of Materials	1.58	.40	1.72	.43	11.57	.001**	.030
Behavior Regulation Index	1.65	.31	1.83	.33	30.23	<.001**	.074
Metacognition Index	1.67	.32	1.80	.33	13.53	<.001**	.035
Global Executive Composite	1.66	.28	1.81	.31	23.81	<.001**	.059
RIBS-S: (162 v 211)							
Total	39.14	11.30	42.82	13.15	8.01	.005**	.021
NEO-FFI-3: (153 v 198)							
Openness	25.97	5.12	26.70	5.01	1.80	.181	.005

Note: Sample sizes for each measure are presented in parentheses (Never v. Any) for those who were Never Punished vs received Any Punishment. BRIEF-A = Behavior Rating Inventory of Executive Function-Adult (mean raw score; higher score is worse); DASS = Depression, Anxiety, and Stress Scale; NEO-FFI-3 = NEO Five Factor Inventory – 3 (Openness subscale); SPSRQ = Sensitivity to Punishment and Sensitivity to Reward Questionnaire; RIBS-S = Runco Ideational Behavior Scale – Short Form. \* $p < .05$ , \*\* $p < .01$

### **Correlations Between CP and Outcome Measures**

Table 8 presents nonparametric correlations between CP (5-17 years of age) and outcome measures, separately for the PP and EPP scales. Greater PP was associated with higher stress, anxiety, and depression, as well as worse subjective EF across BRIEF-A indexes and scales. Furthermore, greater PP was related to lower sensitivity to punishment and reward, though also with

greater creativity and openness. A more negative evaluation of CP, as reflected by the EPP scale, was also associated with higher stress, anxiety, and depression, as well as lower sensitivity to punishment and greater openness. In addition, more negative EPP was related to worse EF across BRIEF-A indexes and the shift, emotional control, initiate, working memory, and organization of materials scales.

**Table 8**

*Correlations between Past Punishment (PP) Scale and Evaluation of Past Punishment (EPP) Scale with outcome measures in the overall sample (Spearman's rho)*

	N		PP		EPP
DASS-21:					
Stress	379	.217	<.001**	.163	.001**
Anxiety	379	.309	<.001**	.236	<.001**
Depression	379	.278	<.001**	.234	<.001**
SPSRQ:					
Punishment	362	-.207	<.001**	-.163	.002**
Reward	362	-.144	.006**	-.101	.054
BRIEF-A:					
Inhibit	406	.234	<.001**	.101	.042
Shift	407	.171	.001**	.171	.001**
Emotional Control	407	.170	.001**	.116	.020*
Self Monitor	405	.116	.02*	.067	.177
Initiate	407	.197	<.001**	.134	.007**
Working Memory	407	.170	.001**	.113	.022*
Planning/Organization	405	.148	.003**	.069	.163
Task Monitor	407	.147	.003**	.061	.219
Org. Materials	407	.204	<.001**	.131	.008**
Behavior Regulation Index	404	.208	<.001**	.127	.011*
Metacognition Index	405	.20	<.001**	.119	.016*
Global Executive Composite	402	.219	<.001**	.133	.007**
RIBS-S:					
Total	394	.121	.016*	.084	.095
NEO-FFI-3:					
Openness	371	.175	.001**	.122	.018*

Note: BRIEF-A = Behavior Rating Inventory of Executive Function-Adult (mean raw score; higher score is worse); DASS-21 = Depression, Anxiety, and Stress Scale; NEO-FFI-3 = NEO Five Factor Inventory – 3 (Openness subscale); RIBS-S = Runco Ideational Behavior Scale – Short Form; SPSRQ = Sensitivity to Punishment and Sensitivity to Reward Questionnaire.

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

## Discussion

The corporal punishment (CP) of children remains common in many regions of the world, including Caribbean nations. Our sample of Bahamian college students reported that CP was common in their childhood (only 8.8% had never experienced CP) and to a lesser extent in adolescence (40.5% never experienced CP). This most often involved spanking, whipping, pinching, or slapping. This is consistent with the high rates in prior studies involving the retrospective report of CP in childhood by

college students in North America (Ateah & Parkin, 2002; Bower-Russa et al., 2001; Graziano & Namaste, 1990; Love. et al., 2025; Owen, 2004; Policastro et al., 2024).

### *Emotional Distress*

College students who received CP endorsed experiencing more anxiety and especially depression than those who did not receive such punishment. These findings are in line with a large body of research showing that CP in childhood is associated with internalising, though also externalising,

behaviours (Gershoff et al., 2018; Visser et al., 2022; Wiggers & Paas, 2022). Notably, emotional distress was somewhat greater in those who received CP in adolescence, along with their reporting more severe non-specific negative arousal (e.g., difficulty relaxing, easily upset, irritable). That CP in adolescence increases the risk for depression in adults, even when controlling for several potential confounding variables, has been previously reported (Straus & Kantor, 1994).

### *Sensitivity to Punishment and Reward*

Sensitivity to reward and punishment plays an important role in the assessment of risks, decision-making ability, and adaptation to change. We found that college students subjected to CP in adolescence reported lower sensitivity to both punishment and reward. A prior study of adolescents with a history of CP showed blunted neural response to reward, but larger response after making errors, during cognitive task performance, interpreted as suggesting possible increased risk for depression and anxiety (Burani et al., 2023). Similarly, negative parenting practices (including CP) have been related to lower self-rated sensitivity to reward in children (Li, 2018). There is a strong link between reduced sensitivity to reward and risk for depression, while heightened (rather than lower) sensitivity to punishment is associated with both depression and anxiety (Katz et al., 2020). It is possible that reduced sensitivity to both reward and punishment in our students who experienced CP reflects a more general blunting of responsiveness to motivationally salient stimuli.

### *Executive Functions*

Our findings revealed poorer self-rated EFs in college students who experienced CP, including worse inhibition, self-initiation, planning and organisation, and monitoring

their performance on tasks for accuracy, as well as maintaining a less organised environment (e.g., work or living-space). Notably, CP received in adolescence as compared to childhood was associated with more diffuse and robust adverse effects on self-rated EF (effect sizes being generally larger, albeit in the small to moderate range). This may be due to late childhood and early- to mid-adolescence being a period of rapid development of EFs (Tervo-Clemmens et al., 2023).

Together, these findings are consistent with prior observations that CP and other negative parenting practices are associated with poorer executive functioning in children (Hughes & Devine, 2019; Kang & Rodriguez, 2023; Li et al., 2023; Liu et al., 2022). This may be due to such practices interfering with the quality of the parent-child relationship and development of secure attachment to parents (Gershoff, 2010), which in turn could lead to children having reduced cognitive resources to explore their environment and therefore less opportunities to practice their executive skills (Lam et al., 2018).

### *Creativity and Openness to Experience*

Comparison of those with and without a history of CP showed small differences in self-rated creativity or openness in our sample. Correlational analysis, however, revealed that greater overall past punishment was associated with higher levels of creativity and openness. This contrasts with reports that CP hinders student creativity (Naz et al., 2011) and child maltreatment (not specific to CP) is related to less openness (Hengartner et al., 2015; Rogosch & Cicchetti, 2004), though research on these relationships is sparse. Our findings could be interpreted to suggest that the more severe the childhood CP, the more college

students view themselves as being creative and open. However, as noted by Forgeard (2024), while it is common for adults to perceive a link between a personal history of adverse events and creativity, longitudinal studies have not supported that conjecture. Rather, creativity and openness in adulthood may serve as a way to help cope with the negative effects of childhood CP.

### *Dose-Response Effect*

The DQ Physical Punishment (PP) Scale is a summary score reflecting overall frequency and severity of CP across childhood and adolescence. Overall, in our sample, the higher the PP score, the greater the difficulty students reported with their EFs (across all BRIEF-A scales), the more severe their emotional distress and stress, and the lower their sensitivity to punishment and reward. A similar pattern was seen for the evaluation of past punishment, whereby the more a student viewed their CP as negative, the more challenges they endorsed with their current functioning. While correlational, these findings are consistent with a recent review indicating a dose-response relationship between CP and increases in negative child outcomes over time, suggesting a causal relationship (Heilmann et al., 2021).

### *Study Limitations*

Our findings should be interpreted within the context of study limitations. First, the sample consisted only of Bahamian college students, who represented a limited subset of the student population at the time, and the majority were female. Thus, results will require replication in a larger and more diverse sample. Furthermore, student report of CP in childhood and adolescence was retrospective, which has inherent limitations. Adults' retrospective report of adverse

childhood experiences (including abuse) has at best modest associations with those experiences assessed prospectively (Reuben et al., 2016). Therefore, further longitudinal research examining the effects of CP on the development of EF, internalising and externalising behaviours, as well as other salient outcomes, will be essential.

We had limited information pertaining to the sociodemographic characteristics of the study participants and their caregivers. As previously observed, the complexity of possible mediating factors between CP and outcomes indicates that further research is needed (Shaw, 2013; Wiggers & Paas, 2022), particularly within lower- and middle-income countries (Cuartas et al., 2022). For example, in The Bahamas, children from families with lower incomes are more likely to have received CP than children in higher income homes (Fielding et al., 2016). While we did not find association between family income and CP, our results may not apply evenly across all socioeconomic groups. A further caveat is that we assessed EF using a self-rated scale, and performance-based tests of EF were not administered. Nonetheless, there is an abundance of evidence showing associations between self-rated EF in adults and a wide variety of salient outcome variables in healthy and clinical samples (Isquith et al., 2014).

### *Study Implications*

Our findings, together with other research, have revealed a variety of negative outcomes in college students subject to CP in childhood, including effects on cognition, mood, and behaviour. Furthermore, CP (at home or within schools) is associated with worse academic outcomes (e.g., poorer grades) in children and adolescents (Gershoff et al., 2019; Heekes et al., 2022;

Visser et al., 2022), as well as college students (Bryan & Freed, 1982). Together, these findings strongly support the need to promote and disseminate evidence-based parenting (Garces-Davila et al., 2024; Wang & Zhang, 2024) and school/teacher (Baumgarten et al., 2023) interventions to reduce and ultimately prevent the use of childhood CP. Such interventions, including efforts to help parents and teachers learn more effective strategies for correcting children, that are non-physical or otherwise punishment-based, could improve short- and long-term developmental outcomes (Sege & Siegel, 2018). It should be noted, however, that recent research in Granada on an intervention to help caregivers develop skills in non-violent child discipline, observed amelioration in neurodevelopmental outcomes, but no significant shift in parental use of CP or attitudes towards CP (Landon et al., 2023). Thus, further research, within the Caribbean cultural context, into approaches that may be more effective for changing attitudes towards CP, and thereby reduce its use, is needed.

In common with other countries in the Caribbean region, the CP of children is not outlawed in The Bahamas (Fielding & Ballance, 2020). The 2023 report of The Bahamas on human rights to the United Nations (United Nations, 2023) and media reports indicate that policymakers do not presently intend to change the laws regarding CP (Rolle, 2023). Given the limited knowledge that parents have about unintended consequences of corporal punishment (Fielding & Ballance, 2021), demonstrating negative outcomes of its use, such as in the present study, may encourage the government and general public of The Bahamas to question the acceptance of physical punishment in raising children. This, coupled with greater dissemination of evidence demonstrating positive outcomes

(e.g., reduced aggression, greater well-being, and lower suicide rates in adolescents) in countries that banned CP (Cramm et al., 2023; Elgar et al., 2018), could also help serve to increase Bahamian policy makers' openness to banning CP.

## **Conclusion**

Our findings are consistent with prior research showing that childhood CP is associated with emotional distress. We also found that college students subjected to childhood CP experience poorer executive functioning in their everyday lives and report less responsiveness to reward and punishment. This raises significant concerns with respect to the emotional and cognitive well-being of such students, as such challenges can have a considerable impact on academic, occupational, and interpersonal functioning. Furthermore, since the early 2000s, it has been reported that the Bahamian workforce lacks "soft skills" and that education levels are an impediment to employers seeking staff (World Bank, 2011). Given the exposure of most people in the country to CP, these concerns are consistent with the global picture that countries in which CP is legal have lower levels of innovation than those where it is illegal (Fielding & Ballance, 2020). Thus, concerted efforts to educate parents, teachers, and legislators about the long-term adverse effects of CP, as well as helping students who have experienced CP to reduce distress and enhance their EFs, will be essential.

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