Childhood Physical Abuse and Sociopathy: Is This Link Magnified among Firstborn Children?

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LONG-TERM EFFECTS FOR SURVIVORS OF CHILDHOOD MALTREATMENT

Childhood Physical Abuse and Sociopathy: Is This Link Magnified among Firstborn Children?

ALAN R. KING
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The Psychopathic Deviate scale of the Minnesota Multiphasic Personality Inventory–2 (MMPI–2) provides a valid psychometric index of sociopathic tendencies in both clinical and nonclinical samples. Childhood physical abuse has provided a robust predictor of sociopathic penchants. The link between childhood physical abuse and MMPI–2 Psychopathic Deviate scores was examined (N = 322) as a function of birth order. A significant childhood physical abuse by birth order interaction was found (p < .0001, η² = .62) with a 6-fold increase in relative risk of a Psychopathic Deviate elevation (T > 70) found for firstborn participants. Childhood physical abuse predicted Psychopathic Deviate scores for firstborn (r = .50, p < .0001, d = 1.15) and middle-born (r = .24, p = .006, d = .49) offspring. Harris–Lingoes subscale scores suggested firstborns felt selectively alienated from self and others in response to childhood physical abuse experiences.

KEYWORDS aggression, emotional abuse, exposure to violence, family, maltreatment, physical abuse, school violence, trauma, victim

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It has been decades since Marston (1928) cautioned that perceived powerlessness in antagonistic parent–child relationships often engendered predictable, even normative, compensatory victim efforts to dominate, rather than comply with, others. Childhood maltreatment today remains a prime suspect in the coarsening of attitudes and behavior that underlies the clinical symptom cluster known as sociopathy. Social learning theory has emphasized the role of modeling in the acquisition of sociopathic inclinations (Maxfield & Widom, 1996). Mediational models (White & Widom, 2003) have drawn attention to secondary problems associated with childhood maltreatment (e.g., self-esteem issues, hostility, maladaptive coping behavior, hyperactivity, substance abuse, etc.) that might also contribute to the steepening of sociopathy developmental trajectories. Descriptions of cultural mechanisms of transmission are also available (deMause, 2010), with exaggerated paternal projections of masculinity implicated as a driving force.

THE CONSTRUCT OF “SOCIOPATHY”

The operational definition of antisocial personality disorder (APD) provided in the Diagnostic and Statistical Manual of Mental Disorders (5th ed. [DSM–5]; American Psychiatric Association, 2013) emphasizes the behavioral manifestations of the syndrome (e.g., nonconformity, deceitfulness, impulsivity, aggressiveness, reckless disregard, personal irresponsibility, absence of warm emotions including remorse). The term psychopath has been increasingly reserved over the years for that most severe, often violent, subset (roughly 25%–33%) of antisocial personalities that breach the high diagnostic threshold set by the Psychopathy Check List (PCL–R; Hare, 1980,1991). Sociopathy remains an older term that has been used as a general reference to the full dimensional range of collective attributes described by psychopathy researchers.

The Psychopathic Deviate (Pd) scale of the Minnesota Multiphasic Personality Inventory–2 (MMPI–2; McKinley & Hathaway, 1944) has provided the most widely researched self-report measure of the trait cluster described as psychopathy initially by Cleckley (1941) in his pioneering work. Structured interview data provided by the PCL–R have provided the best source of concurrent validation for the Pd scale. Graham (2000) summarized available empirical data regarding the validity of the Pd scale. Higher Pd scores have been associated with independent evidence of lying cheating, stealing, sexual acting out, stormy family relationships, rebelliousness, egocentricity, impulsivity, impatience, and many other sociopathic clinical attributes (pp. 71–72). Pd elevations pose a major source of clinical and prognostic concern.

Karpman (1941) proposed Cleckley’s (1941) concept of psychopathy should be distinguished from a “secondary” variant that occurred in
response to environmental stressors. One common assumption has been that Cleckley’s “primary” psychopathy is largely inherited and intractable, whereas “secondary” sociopaths are instead often conflicted, anxious, sometimes empathic, and potentially amendable to intervention efforts. Subsequent researchers have reinforced Karpman’s caution that sociopathy can often be conceptualized as survival strategies secondary to chaotic and highly stressful environmental challenges that demand resourceful coping responses such as allegiance to culturally alienated groups, values, and standards. In this regard, the Harris–Lingoes subscales of the MMPI–2 Pd dimension have proved helpful in distinguishing the two variants of psychopathy. Lilienfeld (1999) provided evidence that individuals with Pd elevations derived largely from the Harris–Lingoes Pd₄ (Social Alienation) and Pd₅ (Social Alienation) subscales reflected secondary as opposed to primary psychopathic attributes. Graham (2000) described social alienation (Pd₄) as feelings of isolation, loneliness, estrangement, unhappiness, remorse, guilt, self-consciousness, and externalized blame for personal shortcomings. He linked self-alienation (Pd₅) to concentration problems, difficulty settling down, viewing life as uninteresting and unrewarding, excessive drinking, excessive drinking, and regrets for unclearly specified past misdeeds. Juvenile delinquency and other primary psychopathy attributes identified by Cleckley are more closely aligned with Authority Problems (Pd₂); and to a lesser extent, Familial Discord (Pd₁) and Social Imperturbability (Pd₃). In fact, Meloy and Gacono (1995) found PCL–R scores in their sample correlated significantly with only the Pd₂ subscale.

CHILDHOOD MALTREATMENT AS A SOCIOPATHY ETIOLOGIC SOURCE

Evidence of the elevated risk of sociopathic pendants among maltreated children and adolescents has been compelling (Fagan, 2005; Ireland, Smith, & Thornberry, 2002; Smith, Ireland, & Thornberry, 2005; Thornberry, Ireland, & Smith, 2001; Widom, 1989; Widom & Maxfield, 2001). Smith et al. (2005) observed the trajectories for criminality, violence, and substance abuse among urban youth followed from adolescence to early adulthood. Adolescent maltreatment (physical, sexual, or emotional abuse or neglect) was predictive of later criminal arrest, violent offending, and drug use.

Childhood physical abuse (CPA) has been associated with reactive (Ford, Fraleigh, & Conner, 2010) and relational (Cullerton-Sen et al., 2008) aggression. Moe, King, and Bailly (2004) found higher rates ($d = 2.5$) of lab-provoked retaliatory aggression among college men who reported a history of CPA. CPA has been linked to a range of additional secondary negative outcomes as well (Miller-Perrin, Perrin, & Kocur, 2009; Scarpa, Haden, & Abercromby, 2010; Sunday et al., 2011). Briere and Elliott (2003) found
higher levels of anxious arousal, depression, anger and irritability, intrusive thoughts, dissociation, and impaired self-reference among physical abuse victims.

The role of childhood abuse and neglect in the genesis of adult intimate partner violence (IPV) has also been well established (Capaldi & Clark, 1998; Dutton & Hart, 1992). Boys exposed to domestic violence appear up to 10 times more likely to engage in IPV than counterparts without this developmental adversity (Straus, Gelles, & Steinmetz, 1980). More recent analyses have examined mediational factors that might magnify or mitigate this risk. One structural model accounted for significant IPV variance through anxious and avoidant attachment styles arising from experiences of childhood violence (Godbout, Dutton, Lussier, & Sabourin, 2009). White and Widom (2003) interviewed close to 1,200 adults (age 29) who were identified through court records to be child maltreatment victims or counterpart controls. Their interviews included lifetime symptom counts of APD (DSM–III–R) criteria. APD in this sample was strongly linked to child maltreatment histories. APD, but not early life (< age 15) aggression itself, was predictive of adult IPV.

CHILD MALTREATMENT COOCCURRENCE

Children and adolescents are often exposed, simultaneously or sequentially, to multiple forms of maltreatment. For example, CPA and domestic violence appear to cooccur at least 50% of the time (Carlson, 1991; McCloskey, Figueredo, & Koss, 1995; O'Keefe, 1995). These potential research confounds limit the extent to which negative outcomes can be attributed to any specific form of childhood maltreatment. Although strong predictors of maladjustment have been found, cause and effect links to specific forms of maltreatment remain elusive.

FIRSTBORN ADVANTAGES AND VULNERABILITIES?

The majority of birth order research has emphasized the relative benefits accrued by firstborn and only children in the achievement realm. Firstborns, as a group, have shown significant advantages over their younger siblings in reading level (Iacovou, 2008), intelligence (Bjerkedal, Kristensen, Skjeret, & Brevik, 2007), years of education (Black, Devereux, & Salvanes, 2005), and career attainment. Over 50% of U.S. presidents and Supreme Court justices, and all of the initial 16 “right stuff” astronauts, were firstborn (Eckstein et al., 2010). Occupational prestige and birth order have even been found to correlate ($p = .76$) at a high level (Eckstein & Kaufman, 2012). Such benefits have been attributed to confluence (i.e., enhanced intellectual environment and opportunities in smaller families) and resource dilution (i.e.,
finite parental time, energy, and monetary resources to distribute) theoretical models. Price (2008) interestingly calculated the average firstborn child receives 20 to 25 more minutes in quality daily parental contact (3,000 hr from age 4–13) than the average secondborn sibling at the same age.

However, Adler (1935) warned firstborn benefits might often be balanced by neuroticism secondary to excessive feelings of responsibility and negative emotional reactions in response to the indignity of being “dethroned.” Kim (2013) recently concluded through a qualitative analysis that the firstborn “privileges” of Korean Americans were indeed tempered by the pressure of high expectations. A recent review of 200 birth order studies found evidence of firstborn traits such as dependence on the approval of others, vulnerability to stress, fearfulness in new situations, egocentricism, and disturbing dream content that might suggest higher relative difficulties in adapting to less-than-optimal developmental challenges (Eckstein et al., 2010).

Birth order effects should be expected to vary substantially based on the predictor and outcome variables under consideration. For example, higher rates of self-injurious (among males) and suicidal (among females) behavior were found to be highest among middle-born children in one large (N = 2,553) psychiatric sample (Kirkcaldy, Richardson-Vejlgaard, & Siefen, 2009). In this study, sibship size was also significantly (p < .0001) correlated to suicidal behavior.

Parental youth and inexperience might elevate the life stress faced by firstborn or only children. Data generated in the Fragile Families and Child Wellbeing study (N = 1,597) indicated younger mothers often relied on harsher (e.g., psychological aggression, physical aggression, spanking, etc.) forms of parenting (Lee, 2009; Lee & Guterman, 2010). In a related study, more conflicted parent–adolescent relationships were found at the same age for firstborn as opposed to second-born siblings (Whiteman, McHale, & Crouter, 2003). Late adolescent fathers also have been found to be at increased risk of depression symptoms (Lee, Fagan, & Chen, 2012). In fact, a recent detailed analysis concluded age 30 was optimal for childbirth in terms of offspring academic performance (Bonesrønning & Massih, 2011). This team found maternal education also favorably impacted this optimal childbearing window.

GENDER CONSIDERATIONS

Although gender differences are common in the raw score distributions for the various MMPI–2 scale dimensions, score interpretations are based on T scores derived from separate gender-based normative data. T scores are not designed to vary by gender, and subsequently, interpretive guidelines do not typically make gender differentiations. However, gender has
been found to interact with other variables in affecting symptoms measured via the MMPI–2, and the possibility that developmental influences such as CPA or birth order might have differential impacts on outcome measurements for men and women warrants consideration. In this study, attention was drawn to potential gender differences in the link between childhood maltreatment and sociopathy. This association appears to be strong for both males and females with gender interactions typically not found (Briere & Elliott, 2003; Farrington, 2003; Krischer & Sevecke, 2008; Weiler & Widom, 1996; Weizmann-Henelius et al., 2010). At least one available study, however, has shown a gender by birth order interaction (described previously) on self-injurious behavior (Kirkcaldy et al., 2009).

OBJECTIVES AND HYPOTHESES OF THIS STUDY

The effects of CPA on sociopathy as a function of birth order represents a potentially important interaction that has been largely unexplored. The CPA–Pd association in this sample is expected to be strong and to vary as a function of birth order. Specifically, firstborn and only children are hypothesized to show relatively higher vulnerability to the effects of CPA on sociopathy development. Firstborn and only children appear more likely to experience harsher parent–child interactions given younger and less experienced parents. Relatively higher levels of egocentricity exhibited by older children might complicate adjustment to the affront of perceived criticism, rejection, threat, or abuse. Abused firstborn and only children, particularly in the earliest stages, would not be able to derive benefit from sibling support, role modeling, or depersonalization of shared and unsettling abuse experiences.

METHOD

Procedure

Students enrolled in most undergraduate courses at this state university were eligible to participate in a research participant pool managed by the Psychology Department. Prospective participants for this study were invited to complete a series of surveys and psychological tests (including the MMPI–2, Violent Experiences Questionnaire [VEQ], Developmental History Questionnaire [DHQ], & Children of Alcoholics Screening Test [CAST]) at his or her discretion. Testing for this study required about 90 min and was completed in privacy usually during the first month of enrollment. All testing protocols were coded with a six-digit self-generated number that assured anonymity but eventual matching of their results in the final database. Participants were not given test feedback, and study objectives were described in general terms.
Participants

College students enrolled in selected undergraduate abnormal, personality, introductory, and clinical psychology courses completed this study for extra credit in their respective class. Participation required completion of the MMPI–2, VEQ, DHQ, and CAST. About half of the enrolled students were estimated to complete the required testing.

Graham (2000) discussed the complexities of evaluating the interpretability of MMPI–2 profiles. Special caution is warranted in assuming conscious deception (“fake bad”) among more educated respondents who might instead be showing evidence of adjustment in their reserved self-disclosure tendencies. Perhaps a more pressing issue in college populations involves random responding, which can be reliably detected through F scale elevations that often exceed 100 (Wetter, Baer, Berry, Smith, & Larsen, 1992). In this study, a decision was made to set the validity thresholds at T scores of 80, 90, or 80 on the L, F, or K scale, respectively. These more liberal validity scale cutoffs have been supported for use in college samples (Butcher, Graham, & Ben-Porath, 1995). These exclusion thresholds led to the omission of 15 participants in this study.

Participants are classified as oldest (firstborn), middle, youngest, or only children. A total of 148 potential participants were excluded because they had fewer than two siblings. This exclusion criterion could not, of course, be applied to participants classified as only children.

Materials

Violent Experiences Questionnaire

The original (King, Tuhy, & Harris, 1989) and revised (King, 2012) VEQ provide retrospective, face-valid estimates of the frequency with which respondents were “pushed, shoved, struck, punched, or threatened with physical violence” during upbringing by “either parent.” The frequency of these aggressive acts was quantified for four different recording periods spanning the ages of 5 to 19. A total CPA score is generated by respondents and interpreted as the number of days per year (maximum set at 104) an index act of parental physical abuse occurred during the 15-year respective recording time period. The VEQ CPA scale has been found to be internally consistent ($\alpha = .91$) with elevations linked to rates of laboratory-provoked aggression that far exceeded ($d = 2.5$) that observed for control participants (Moe et al., 2004).

Minnesota Multiphasic Personality Inventory–2

The validity, clinical, and Harris–Lingoes subscales of the MMPI–2 were described previously. All of these scales have been found to possess sound
psychometric properties. The scoring and interpretation manual (Butcher, Dahlstrom, Graham, Tellegen, & Kaemmer, 1989) established internal consistency coefficients for these clinical and validity scales of about .65 in the normative sample with 1-week test–retest reliabilities ranging from .77 to .81. Although all of the scales have garnered concurrent validity support from thousands of studies over the years, this analysis is designed to provide unique data regarding the association of CPA and clinical Scale 4 (Pd) of the MMPI–2.

DEVELOPMENTAL HISTORY QUESTIONNAIRE

The DHQ is a customized self-report questionnaire that assesses family structure and many different formative events experienced during the course of upbringing (King, Bailly, & Moe, 2004). Five DHQ items were used in these analyses (gender, age, birth order, sibship size, parental divorce, and maternal and paternal relationship closeness). Birth order was assessed through four questions (i.e., lifetime older and younger biological brothers and sisters). Sibship size was derived from summation.

The occurrence and age of parental divorce pertained to biological parents. Maternal and paternal closeness was quantified as follows: “How would you generally describe your relationship with your biological mother/father during upbringing? 4) strongly favorable; 3) usually favorable; 2) lots of ups and downs; 1) usually unfavorable; 0) strongly unfavorable.”

CHILDREN OF ALCOHOLICS SCREENING TEST

The CAST (Jones, 1982) is a popular dimensional self-report measure that identifies indicators of maternal and paternal problem drinking during upbringing. Scores range from 0 to 30 with those exceeding 5 (25% of normative sample) established as a valid indicator of parental alcoholism (Charland & Cote, 1998; Jones, 1983; Lease & Yanico, 1995). CAST internal consistency has been established as high as .98 (Jones, 1982; Yeatman, Bogart, Geer, & Sirridge, 1994) with 8-week test–retest reliability at .88 (Clair & Genest, 1992).

Analytic Strategy

This study relies on a three-factor (Gender × Birth Order × CPA) between-group research design to assess the predictive value of these variables on the Pd scores generated by the 319 college participants in this sample. The Birth Order × CPA interaction will represent a focal interest tested through both bivariate correlation analysis and inferential (analysis of variance [ANOVA]) statistics. The Fisher z-transformation procedure (Fisher, 1915) provides a popular statistical method of testing whether or not two correlation coefficients, even if derived from samples of unequal size, are equal
in strength (Bond & Richardson, 2004; Cox, 2008; Ferguson, 1981). Fisher 
$z$-transformation tests will be used to evaluate the significance of CPA–Pd 
correlation strength differences found between the birth order cells. A multi-
variate analysis of variance (MANOVA) will be used to assess birth order cell 
equivalences for a number of important variables under examination (gen-
der, age, CPA, Pd, history of parental divorce, parental problem drinking, and 
parental closeness during upbringing). Collateral bivariate correlation analyses 
will be conducted to determine if significant CPA–Pd associations extend 
similarly to the five Harris–Lingoes Pd subscale dimensions.

RESULTS

The final sample ($N = 319$), after MMPI–2 validity and birth order exclusions, 
was comprised of largely White (93.4%) women (74%). Partial representa-
tion was provided by American Indian (3.3%), Hispanic (0.4%), Asian 
(0.4%), and biracial or other (2.5%) students. American Indian students con-
tributing to this university participant pool have been identified previously 
as largely Ojibwa or Chippewa in their tribal affiliations. Gender was dis-
btributed similarly across the four birth order groups, $\chi^2(3, N = 319) = 3.37,$ 
$p = .34.$

The Pd and CPA score distributions approximated those found in other 
samples. Pd scores were standardized (T scores) and distributed normally. 
Extreme Pd score elevations ($T > 65$) occurred for 12.5% of the sample. The 
CPA distribution was positively skewed, with 35.4% of the sample 
reporting some history of being pushed, shoved, punched, struck, or threat-
ened with violence between the ages of 5 and 19. CPA was reported by 
12.2% as occurring at least once a year over a 15-year recording period 
($> 15$ total incidents). Table 1 presents descriptive statistics for the sample 
sorted by birth order. CAST scores varied ($M = 5.13, SD = 8.97$), but most 
(58.4%) participants generated scores of 0 for both parents. Close to 27% 
of this sample did indicate maternal (9.4%) or paternal (22.9%) alcoholism 
(CAST $> 5$).

**TABLE 1** Descriptive Statistics for Predictor, Outcome, and Covariate Variables by Birth Order

<table>
<thead>
<tr>
<th>Birth order</th>
<th>$n$</th>
<th>Age $M$</th>
<th>Age $SD$</th>
<th>Sibship size $M$</th>
<th>Sibship size $SD$</th>
<th>Pd (Scale 4) $M$</th>
<th>Pd (Scale 4) $SD$</th>
<th>CPA $M$</th>
<th>CPA $SD$</th>
</tr>
</thead>
<tbody>
<tr>
<td>Only</td>
<td>24</td>
<td>22.79</td>
<td>5.66</td>
<td>0</td>
<td>0</td>
<td>54.54</td>
<td>7.54</td>
<td>0.61</td>
<td>2.75</td>
</tr>
<tr>
<td>Oldest</td>
<td>78</td>
<td>24.40</td>
<td>7.25</td>
<td>2.68</td>
<td>1.04</td>
<td>53.42</td>
<td>11.39</td>
<td>3.32</td>
<td>14.26</td>
</tr>
<tr>
<td>Middle</td>
<td>135</td>
<td>25.07</td>
<td>7.69</td>
<td>3.83</td>
<td>2.20</td>
<td>52.93</td>
<td>9.03</td>
<td>3.54</td>
<td>14.75</td>
</tr>
<tr>
<td>Youngest</td>
<td>82</td>
<td>22.80</td>
<td>4.45</td>
<td>3.24</td>
<td>1.84</td>
<td>52.40</td>
<td>10.67</td>
<td>1.99</td>
<td>9.78</td>
</tr>
<tr>
<td>Total</td>
<td>319</td>
<td>24.15</td>
<td>6.78</td>
<td>3.11</td>
<td>2.04</td>
<td>53.04</td>
<td>9.96</td>
<td>2.87</td>
<td>12.91</td>
</tr>
</tbody>
</table>

*Note.* CPA = childhood physical abuse. Middle > oldest/youngest > only for sibship size.
Birth Order and CPA as Predictors of Pd

An ANOVA (general linear model) was used to test the effects of CPA, birth order, gender, and their interactions on the MMPI–2 Pd scores (see Table 2). The overall model was significant \( (p = .0003, \eta^2 = .12) \). A main effect was found for CPA \( (p = .046, \eta^2 = .18) \) and the CPA × Birth Order interaction \( (p = .004, \eta^2 = .62) \). Main effects were not found for birth order, gender, or any of the remaining interactions. The results of Table 2 remained the same when standardized CPA scores were substituted in the analysis.

Pd–CPA Pearson Correlation Analyses

Table 3 shows differences in the strength of the bivariate correlations between CPA and Pd as a function of birth order. Significant bivariate CPA–Pd correlations were found for only the oldest and, to a lesser extent, the middle cohorts. Significant CPA–Pd bivariate correlations were found for oldest \( (r = .50, p < .0001, d = 1.15) \) and middle \( (r = .50, p < .0001, d = .49) \) children. Fisher z transformation comparisons found the overall CPA–Pd association for the oldest group was significantly stronger than that found for the middle \( (p < .05) \) and youngest \( (p < .01) \) cohorts. The middle group was stronger \( (p < .05) \) than the youngest participants (oldest > middle > youngest). Only children were not distinguished statistically from the other three cohorts.

Firstborn participants showed a statistically stronger correlation \( (p < .05) \) with both the Pd4 (Social Alienation) and Pd5 (Self Alienation) scales than the other four cohorts. Firstborn correlations between their CPA and Pd4 \( (r = .48, p < .0001, d = 1.09) \) and Pd5 \( (r = .44, p < .0001, d = .98) \) scores were substantial. Significant correlation strength differences were otherwise not found for any of the remaining Harris–Lingoes subscales. The overall

<p>| TABLE 2 | Analysis of Variance Results for Childhood Physical Abuse (CPA), Birth Order, and Gender and the Interaction Factors as Predictors of MMPI–2 Pd Scores |</p>
<table>
<thead>
<tr>
<th>Source</th>
<th>df</th>
<th>Sum of squares</th>
<th>MS</th>
<th>F</th>
<th>p</th>
</tr>
</thead>
<tbody>
<tr>
<td>Model</td>
<td>14</td>
<td>3760.28</td>
<td>268.59</td>
<td>2.94</td>
<td>.0003</td>
</tr>
<tr>
<td>Error</td>
<td>304</td>
<td>27803.27</td>
<td>91.458</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Corrected total</td>
<td>318</td>
<td>31563.55</td>
<td></td>
<td></td>
<td></td>
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</table>

<table>
<thead>
<tr>
<th>Source</th>
<th>df</th>
<th>Type III SS</th>
<th>MS</th>
<th>F</th>
<th>p</th>
</tr>
</thead>
<tbody>
<tr>
<td>CPA</td>
<td>1</td>
<td>366.08</td>
<td>366.08</td>
<td>4.00</td>
<td>.046</td>
</tr>
<tr>
<td>Gender</td>
<td>1</td>
<td>0.0009</td>
<td>0.0009</td>
<td>0.00</td>
<td>.99</td>
</tr>
<tr>
<td>Birth order</td>
<td>3</td>
<td>75.50</td>
<td>25.17</td>
<td>0.28</td>
<td>.84</td>
</tr>
<tr>
<td>CPA × Gender</td>
<td>1</td>
<td>28.69</td>
<td>28.69</td>
<td>0.31</td>
<td>.58</td>
</tr>
<tr>
<td>CPA × Birth Order</td>
<td>3</td>
<td>1247.60</td>
<td>416.87</td>
<td>4.55</td>
<td>.004</td>
</tr>
<tr>
<td>Birth Order × Gender</td>
<td>3</td>
<td>282.34</td>
<td>94.11</td>
<td>1.03</td>
<td>.38</td>
</tr>
<tr>
<td>CPA × Birth Order × Gender</td>
<td>2</td>
<td>4.84</td>
<td>2.42</td>
<td>0.03</td>
<td>.97</td>
</tr>
</tbody>
</table>

Note. CPA analyzed as an unstandardized continuous variable. \( R^2 = .12 \).
TABLE 3 Childhood Physical Abuse Bivariate Correlations with Full and Harris–Lingoes Pd Scores as a Function of Birth Order

<table>
<thead>
<tr>
<th>Birth order</th>
<th>N</th>
<th>r</th>
<th>p</th>
<th>( \text{Pd} )</th>
<th>( \text{Pd}_1 )</th>
<th>( \text{Pd}_2 )</th>
<th>( \text{Pd}_3 )</th>
<th>( \text{Pd}_4 )</th>
<th>( \text{Pd}_5 )</th>
</tr>
</thead>
<tbody>
<tr>
<td>Only</td>
<td>24</td>
<td>.34</td>
<td>.11</td>
<td>.06</td>
<td>.22</td>
<td>.18</td>
<td>.02</td>
<td>.06</td>
<td></td>
</tr>
<tr>
<td>Oldest</td>
<td>78</td>
<td>.50</td>
<td>&lt;.0001</td>
<td>.23*</td>
<td>.38**</td>
<td>.09</td>
<td>.48****</td>
<td>.44****</td>
<td></td>
</tr>
<tr>
<td>Middle</td>
<td>135</td>
<td>.24</td>
<td>.006</td>
<td>.17*</td>
<td>.17*</td>
<td>.05</td>
<td>.12</td>
<td>.10</td>
<td></td>
</tr>
<tr>
<td>Youngest</td>
<td>82</td>
<td>-.04</td>
<td>.73</td>
<td>.20</td>
<td>.19</td>
<td>.09</td>
<td>-.05</td>
<td>-.03</td>
<td></td>
</tr>
<tr>
<td>Total</td>
<td>319</td>
<td>.24</td>
<td>.0001</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

* \( p < .05 \), ** \( p < .01 \), *** \( p < .001 \), **** \( p < .0001 \).

CPA–Pd correlation did not differ significantly between the men, \( r(81) = .34 \), \( p < .002 \), and women, \( r(234) = .19 \), \( p = .003 \).

Additional Pd Predictors

Pd scores were higher among older participants, \( r(314) = .24 \), \( p < .0001 \), \( d = .49 \), and those reporting histories of CPA, \( r(319) = .24 \), \( p < .0001 \), \( d = .49 \). Pd scores were higher among participants describing concerns about maternal drinking, \( r(317) = .18 \), \( p = .001 \), \( d = .37 \), or a less favorable parental relationship, \( r(311) = -.31 \), \( p < .0001 \), \( d = .65 \). Similarly, Pd scores were found to be relatively higher among participants describing concerns about paternal drinking, \( r(317) = .27 \), \( p < .0001 \), \( d = .56 \), or a less favorable paternal relationship, \( r(301) = -.16 \), \( p = .006 \), \( d = .32 \). Pd scores were relatively higher among participants whose parents divorced (prior to age 20) rather than those raised in intact families (\( M_{\text{intact}} = 52.44 \), \( SD_{\text{intact}} = 10.18 \) vs. \( M_{\text{div}} = 55.93 \), \( SD_{\text{div}} = 8.56 \)), \( F(1, 314) = 5.70 \), \( p = .02 \), \( d = .35 \). Pd scores did not vary significantly as a function of sibship size, \( r(314) = .04 \), \( p = .50 \).

Birth Order Cell Equivalences

Sibship size differed predictably as a function of birth order, \( F(3, 311) = 24.29 \), \( p < .0001 \), \( \eta^2 = .24 \), but not gender, \( F(1, 311) = .08 \), \( p = .78 \), or the Birth Order \( \times \) Gender interaction, \( F(3, 311) = .47 \), \( p = .70 \). A post-hoc Student–Newman–Keuls test indicated sibship size for only children was significantly smaller than that found for the three remaining cells. Middle children had significantly more siblings than oldest and youngest.

A MANOVA was used otherwise to establish that none of the collective or individual remaining variables from this study (CPA, age, parental divorce, maternal problem drinking, paternal problem drinking, maternal closeness, or paternal closeness) differed as a function of birth order, gender, or the Gender \( \times \) Birth Order interaction, \( \lambda(27, 804) = 1.15 \), \( p = .28 \).
Birth order regression slopes

Figure 1 illustrates CPA–Pd simple regression slope differences as a function of birth order. Birth order slopes generated from four independent simple linear regression analyses that relied on standardized CPA scores derived from Table 1 cell means and standard deviations. The relative strength of the CPA–Pd association for firstborn participants is shown in the top red line. CPA provided a statistically significant predictor of Pd for the oldest and middle cohorts.

CPA as a Categorical Predictor Variable

CPA can be analyzed as a categorical variable using operational cutoffs for either frequency or severity of abuse. For example, over 12% of this sample reported more than 15 index incidents as defined by the VEQ. Prevalence rates for this level of CPA were 4.2%, 12.8%, 7.3%, and 10.4% for the only, oldest, middle, and youngest birth order cohorts, respectively, \( \chi^2(1, N = 319) = 2.3, p = .51 \). Although meaningful birth order analyses

<table>
<thead>
<tr>
<th>Birth Order</th>
<th>( \beta )</th>
<th>SE</th>
<th>df</th>
<th>MS</th>
<th>F</th>
<th>P</th>
</tr>
</thead>
<tbody>
<tr>
<td>Oldest</td>
<td>5.74</td>
<td>1.13</td>
<td>1.76</td>
<td>2535.62</td>
<td>25.84</td>
<td>&lt;.0001</td>
</tr>
<tr>
<td>Only</td>
<td>2.53</td>
<td>1.51</td>
<td>1.22</td>
<td>148.05</td>
<td>2.80</td>
<td>.11</td>
</tr>
<tr>
<td>Middle</td>
<td>2.13</td>
<td>0.76</td>
<td>1.133</td>
<td>7.88</td>
<td>610.87</td>
<td>.006</td>
</tr>
<tr>
<td>Youngest</td>
<td>-0.42</td>
<td>1.19</td>
<td>1.80</td>
<td>14.29</td>
<td>0.12</td>
<td>.73</td>
</tr>
</tbody>
</table>

**FIGURE 1** Childhood physical abuse–Pd relationship slope birth order contrasts.
were precluded by these low and uneven cell counts, a more narrow focus on the oldest cohort proved informative. Pd scores varied substantially between oldest participants with CPA scores of 0 (n = 42), between 0 and 1 (n = 22), and > 1 (n = 14), F(2, 75) = 6.33, p = .003. A post-hoc analysis (Student–Newman–Keuls) found the participants reporting CPA > 1 (> 15 total incidents) scored significantly higher (p < .05) than those in the remaining two cells. The Pd difference between the high (M = 62.5, SD = 14.34) and zero (M = 50.88, SD = 9.75) cells translated into a sixfold increase in the relative risk of a Pd score in excess of 70 (RR = 6.0, CI [1.23, 29.30], p = .027, d = 1.02).

DISCUSSION

The relationship between sociopathy and childhood maltreatment remains one of keen interest and urgent importance in the behavioral science literature. Empirical data establishing this linkage can be found in clinical samples where prevalence rates for oppositional defiant disorder, conduct disorder, APD, and frank criminality and psychopathy appear to surge among childhood maltreatment victims. Connections between sociopathy and CPA have been investigated less frequently within general and college samples. The significant CPA–Pd association (r = .24, p < .0001) found in the present college sample further illustrates the robustness of this connection. Indeed, this strength of association might be minimized in college samples that are characteristically distinguished by relatively restricted predictor (CPA) and criterion (Pd) variable distributions. The CPA × Birth Order interaction found in this study was also substantial. The CPA–Pd relationship was statistically strongest among firstborn participants, followed by middle and then last-born children (the cell size for only children was perhaps too small for meaningful comparisons). Firstborn participants who experienced modest levels of CPA (i.e., > 15 total lifetime incidents) were six times more likely to generate Pd scores in excess of T = 70 (d = 1.02).

Birth Order Effect Sources?

Confluence and dilution birth order theories have historically attributed the higher average academic and career success of firstborn and only children to their disproportionate access to family financial and emotional resources (Price, 2008). “Special” status might, however, bring unique pressures and self-esteem needs as cautioned by Adler (1935) and others (Eckstein et al., 2010; Kim, 2013). Adjustment difficulties in response to perceived criticism, rejection, threat, or abuse might be magnified among firstborn or only children. Further, the relative youth and inexperience of first-time parents could heighten sources of conflict and ego deflation (Lee, 2009; Lee, et al., 2012;
Lee & Guterman, 2010). Victims of frank CPA might not benefit fully from the support, role modeling, and processing of unsettling experiences that older siblings might provide.

Data were available in this study to ascertain whether or not birth order differences in personality traits, resource allocations, stress levels, parenting qualities, or sibling support were evident. However, neither CPA nor Pd levels were found to vary naturally as a function of birth order alone. Firstborns in this sample did not recall higher levels of CPA than their counterparts classified in other birth order positions. Similarly, Pd score distributions did not differ significantly across the birth orders. Thus, the stronger association found between CPA and Pd scores among firstborns in this sample did not appear to be attributable to naturally occurring differences in abuse experiences or sociopathic tendencies. Reasons for the selective elevation of sociopathic attributes among physically abused firstborn offspring seem elusive.

Potential Birth Order Confounds

A series of collateral analyses were useful in discounting the impact of a number of potential confounding factors in this research design. Age and gender were distributed similarly across the birth order cohorts, and none of the nine gender interactions examined in this study approached statistical significance. Birth order differences were not observed in parental problem drinking or maternal or paternal relationship quality. Although sibship size varied significantly across birth orders, Pd scores across this sample were unrelated to family size (r = .04). Parental divorce rates did vary significantly between the only, oldest, middle, and youngest offspring (32%, 23%, 16%, and 11%, respectively), and Pd scores were found to be lower (d = .35) among participants from intact families. The only group was the most impacted, however, and it was not clearly differentiated from the remaining birth orders in any other meaningful way.

Primary Versus Secondary Sociopathy Effects

The strength of the relationship between CPA and overall Pd scores varied by birth order (oldest > middle > youngest). The Harris–Lingoes subscales were helpful in establishing that most of the Pd variance accounted for by CPA among firstborns was attributable to secondary, rather than primary, sociopathy symptoms. CPA in this sample was strongly correlated with both the Pd4 (Social Alienation) and Pd5 (Self Alienation) subscales for only the firstborn participants. These relationships with the secondary sociopathy alienation symptoms were not found for any other group. Significant birth order differences in CPA–Pd correlation strength were not
found for the remaining Harris–Lingoes subscales thought to reflect primary symptoms of sociopathy (Family Discord, Authority Problems, and Social Imperturbability). Thus, CPA predicted relatively higher levels of social and self-estrangement for the oldest offspring in this sample with elevated family discord and authority problems observed to varying degrees across birth order cohorts.

Limitations and Further Studies

Like most college samples, the external validity of these results might be limited in predictable ways (e.g., ethnic homogeneity, restricted variable distributions, educational attainment, participant adjustment levels and adaptability, etc.). These findings might not prove replicable in broader college, clinical, or general samples. Although efforts were made to monitor a number of potential birth order confounds, many other remained unidentified (e.g., cooccurring forms of childhood maltreatment). Future researchers will hopefully extend these birth order analyses to additional developmental factors that could prove to be even more meaningful. For example, although not statistically significant, the trend toward lower and less variable CPA levels within the only cohort was interesting. The parental divorce rate in that group was also curiously higher. Larger samples could permit the systematic examination of higher order interactions involving family structure, developmental history, resiliency factors, and environmental stressors, including cooccurring forms of childhood maltreatment.

REFERENCES


