



The Interplay Between Positive and Negative Parenting and Children's Negative Affect on Callous-Unemotional Traits

Monika Dargis¹ · James J. Li^{1,2}

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Abstract

Callous-unemotional (CU) traits, which include the lack of guilt, lack of empathy, unemotionality, are widely considered a developmental precursor to psychopathic traits and criminal behavior in adulthood. Although parenting-based interventions have been indicated for children with high CU traits, studies on the relationship between parenting and CU traits have produced mixed findings. We hypothesized that children's temperament, particularly their negative affect, may modulate the association between negative (e.g., harsh discipline) and positive (e.g., positive reinforcement) parenting behavior and CU traits in children. This study examined the interactions between child negative affect and positive and negative dimensions of parenting behavior as they pertained to children's CU traits (i.e., total scores, callousness, uncaring, and unemotionality), measured via Inventory of Callous-Unemotional Traits (ICU). Using a cross-sectional sample of $N = 201$ 5–6 year-old children, we found that positive parenting was negatively associated with total CU scores, whereas negative parenting was positively associated. Furthermore, negative parenting behavior was associated with higher levels of children's CU (specifically, on the uncaring dimension of the ICU), but only among children with high negative affect. Results provide preliminary evidence that high children's negative affect may increase their sensitivity to negative parenting behaviors as it pertains to CU, and the uncaring dimension specifically. Clinical and treatment implications are discussed.

Keywords Callous-unemotional traits · Parenting · Temperament · Negative affect

Highlights

- The link between parenting behavior and children's CU traits is still unclear.
- Negative parenting was associated with children's uncaring CU traits.
- This association was only detected among children with high negative affect.
- Development of children's CU jointly depends on parenting and their temperament.

Callous-unemotional (CU) traits (e.g., lack of guilt, lack of empathy, unemotionality) are believed to be a developmental precursor to psychopathic traits and criminal behavior in

adulthood (Fink et al. 2012; Frick and White 2008). CU traits are also relatively stable throughout development (Fanti et al. 2017; Frick et al. 2005; Goulter et al. 2017). Moreover, children with CU traits display deficits in affective processing that resemble the callous affective profile seen in adult psychopathic offenders (Muñoz 2009; Woodworth and Waschbusch 2008). Accordingly, there has been a growing interest in identifying effective targets for early interventions among the large subset of children who present with elevated CU traits.

CU traits are distinguishable by three (typically correlated) dimensions, including callousness, unemotionality, and uncaring (Frick 2004). The callousness dimension refers to a lack of empathy for others or remorse for wrongdoings (e.g., “the feelings of others are unimportant

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✉ James J. Li
james.li@wisc.edu

¹ Department of Psychology, University of Wisconsin-Madison, Madison, WI, USA

² Waisman Center, University of Wisconsin-Madison, Madison, WI, USA

to me”), the unemotionality dimension reflects deficits in affective experience and/or expression (e.g., “I hide my feelings from others”), and the uncaring dimension reflects a lack of caring about others and own performance on tasks (e.g., “I try not to hurt others’ feelings” [reverse scored]). Certain dimensions, such as uncaring, have been shown to be more predictive of later psychopathic traits in adolescents and adults than other dimensions (Feilhauer et al. 2012; Fink et al. 2012). Furthermore, the uncaring dimension has been found to be specifically associated with deficits in attending to fearful facial expressions, which is believed to be an endophenotype of adult psychopathy (White and Delk 2017). These studies suggest that the uncaring CU dimension may be a possible pathway of risk for later psychopathic traits in adults, although the callous and unemotional dimensions have also been linked to long-term negative adolescent and adult outcomes such as aggression and antisocial behaviors (Ansel et al. 2015). It is worth noting that there are relatively few studies of CU traits in young children (Houghton et al. 2013) such that additional studies of the long-term consequences of early childhood CU are still needed.

Parenting-based interventions have been consistently employed for children with high CU traits and associated externalizing problems, in part because negative parenting behaviors (e.g., lack of maternal responsiveness, inconsistent discipline, harshness) are associated with higher levels of CU traits (Fanti and Munoz Centifanti 2014; Hawes et al. 2011; Pardini et al. 2007; Pasalich et al. 2012, 2014; Vitacco et al. 2003; Yeh et al. 2011). However, whether negative parenting (or lack of positive parenting) is a correlate or causal risk for CU development in children is unclear. For instance, Fanti and Munoz Centifanti (2014) found that children high on CU traits were more likely to have parents who were less involved and had higher levels of distress compared to children with low and moderate CU traits. Yet, other studies have shown no association between parenting behavior and childhood CU traits. For instance, ineffective parenting (e.g., lack of supervision, harsh discipline) was associated with greater offspring conduct problems, but only among children without CU traits (Wootton et al. 1997). Children with CU traits displayed behavioral problems regardless of parental behavior (see also Hawes and Dadds 2005; Hipwell et al. 2007). The mixed evidence in support of an association between parenting behavior and CU traits in children is concerning given that parenting-based modifications are the most widely-used intervention for children with CU traits and associated externalizing problems.

One major limitation of prior research on parenting behaviors and CU traits in children is that few studies had accounted for the effects of both negative and positive parenting behaviors as they pertain to child behavior in the same model. For instance, a parent who scores high on a

negative parenting dimension (e.g., use of harsh discipline on their child) does not preclude them from also scoring high on a positive parenting dimension as well (e.g., their frequency of positive reinforcement or praise on their child). Empirically, there are several lines of evidence showing that these dimensions independently associate with child outcomes in different ways (Chronis et al. 2007; Ellis and Nigg 2009; Li and Lee 2012). Research has also shown that negative and positive dimensions of parenting behavior measured from the Alabama Parenting Questionnaire are factor analytically independent (Pettit et al. 1997). As high levels of negative parenting and a lack of positive parenting (in the absence of overt negative parenting) have independently been linked to CU traits, consideration of both constructs in the same models may be important. For instance, it remains unclear whether negative parenting behavior associates with individual differences in children’s CU traits after adjusting for concurrent positive parenting behaviors (Waller et al. 2013).

Another plausible reason for the mixed findings in the parenting and CU literature might be because few studies have accounted for individual differences in the child’s temperament as well. Child negative affect (i.e., “difficult temperaments”) may potentially moderate the association of parenting and CU across development, given its association with both CU (in children) and psychopathic traits (in adults) (Dargis and Koenigs 2018; Gill and Stickle 2016; Hicks et al. 2004). Broadly, children with high levels of negative affect may be especially sensitive to negative parenting behaviors such that they exhibit worse behavioral outcomes relative to children with low levels of negative affect (Clark et al. 2000; Kim et al. 2001; Lengua et al. 2000). Thus, one possibility is that the combined effects of high negative affect in children and their exposure to high levels of negative parenting may lead to greater expression of CU traits relative to children with low negative affect. Evidence in support of this hypothesis may indicate differential efficacy in parenting-based interventions for children with high CU.

The current study employed a cross-sectional sample of 5–6 year-old children to examine the associations between parenting behaviors, including both positive and negative dimensions, and child negative affect in relation to children’s CU traits. Given the prior evidence suggesting that children with high negative affect may be more sensitive to negative parental behaviors (Clark et al. 2000; Kim et al. 2001; Lengua et al. 2000), we predicted that the association between negative parenting behaviors and individual differences in CU traits would be moderated by child negative affect, such that at high levels of child negative affect, negative parenting would be associated with higher CU traits relative to children with lower levels of negative affect.

Method

Participants

The current study used baseline assessment data (collected between 2016 and 2018) from a longitudinal study on biological and environmental antecedents of trajectories of externalizing psychopathology in 5–6 year-old children from a mid-sized midwestern city in the United States. The sample consists of 201 children and their families who were recruited through research registries, social media (i.e., Facebook posts, parenting blogs), elementary schools, clinics, community centers, and doctors' offices. Participants were ineligible to participate if they were previously diagnosed with an intellectual disability or Autism Spectrum Disorder, did not live with a biological parent at least half of the time, or were not fluent in English. None of the children in the sample were reported to be on stimulant medications at the time of baseline assessment. All study protocols were approved by the university's institutional review board.

Procedures

Eligible families were mailed study questionnaires to complete and then invited to the laboratory to complete a comprehensive cognitive and behavioral battery consisting of interviews and laboratory-based tasks (i.e., parent-child observations, neuropsychological tests, behavioral paradigms). All parent and child assessments were conducted by doctoral students in school or clinical psychology along with trained undergraduate research assistants with previous experience working with children

and families. All research assistants were directly supervised by a licensed clinical psychologist and attended weekly supervision meetings with the clinical psychologist to ensure that the administration and interviews were valid and reliable. Families were also provided a written summary of the results based on the data obtained from the clinical interview, child psychological assessment, and other cognitive and behavioral questionnaires. All reports were reviewed and signed by the licensed clinical psychologist.

Measures

Inventory of callous-unemotional traits

The ICU is a 24-item parent-reported instrument used to assess callous and unemotional behaviors in their children (ICU; Frick 2004; Kimonis et al. 2016). Items are rated on a 0 (“not at all true”) to 3 (“definitely true”) scale. The ICU has three subscales based on previous factor analytic studies of children: the callousness dimension (e.g., “I do not care who I hurt to get what I want”; $\alpha = 0.63$), unemotional dimension (e.g., “I express my feelings openly”, reverse scored; $\alpha = 0.64$), and uncaring dimension (e.g., “I always do my best”, reverse scored; $\alpha = 0.80$) (Essau et al. 2006; Ezpeleta et al. 2017). However, these dimensions also strongly correlate with one another (see Table 1) and load strongly onto just a single dimension within an exploratory factor analysis in this sample (i.e., the first factor accounted for 21.6% of the variance in the ICU items, whereas the second factor accounted for only 9.5%). A composite score (reflecting the ICU total score) and scores for each dimension were used in the current analysis.

Table 1 Correlations and descriptive information

Variable	1	2	3	4	5	6	7	8	9	10	11
1. Child age		0.08	0.07	0.01	0.03	0.05	−0.03	−0.02	0.03	0.03	−0.11
2. Child sex (male)			−0.01	0.12	0.06	0.12	0.11	0.04	−0.08	−0.04	0.02
3. Parental education				−0.008	−0.03	−0.07	0.04	−0.09	−0.06	0.04	0.03
4. ICU total score					0.76**	0.57**	0.89**	0.20**	−0.27**	0.30**	0.20**
5. ICU callous						0.18**	0.53**	0.26**	−0.18*	0.35**	0.18*
6. ICU unemotional							0.35**	−0.05	−0.19**	−0.01	0.11
7. ICU uncaring								0.19**	−0.24**	0.28**	0.17*
8. CBQ negative affect									−0.12	0.27**	0.14*
9. APQ positive parenting										−0.18*	−0.09
10. APQ negative parenting											0.36**
11. NEO neuroticism											
Means	6.04	−	6.69	16.98	3.66	2.95	10.40	49.88	67.05	28.96	20.01
S.D.	0.40	−	1.67	6.96	2.78	2.09	4.06	7.65	5.39	4.43	7.54

Parental education coded on a Likert scale, where “6” = highest level of education is a bachelor's degree or above

* $p < 0.05$; ** $p < 0.01$

Children’s behavior questionnaire

The CBQ is a 36-item parent-reported questionnaire used to assess different dimensions of their child’s temperament, including negative affect (e.g., “has temper tantrums when s (he) doesn’t get what s(he) wants”; $\alpha = 0.77$), extraversion (e.g., “often prefers to watch rather than join other children playing” [reverse]; $\alpha = 0.76$), and effortful control (e.g., “can lower his/her voice when asked to do so”; $\alpha = 0.73$). Parents were asked to rate their child on a 7-point scale ranging from 1 (extremely untrue of your child) to 7 (extremely true of your child) (CBQ; Rothbart et al. 2001). The current study focused on only the negative affect dimension of the CBQ, of which a composite score was used in the analysis.

Alabama parenting questionnaire

For the APQ, parents self-reported on the frequency, where 1 = never and 5 = always, on 42 items related to their own parenting practices and behaviors (APQ; Frick 1991). Global positive and negative dimensions of parenting behaviors have been delineated based on previous factor analytic studies (Feilhauer et al. 2012; Frick et al. 2005; Kaiser et al. 2010; Li and Lee 2012; Shelton et al. 1996). The global positive dimension includes parents’ level of involvement (e.g., “you help your child with his/her homework”; 10 items) and frequency of using positive reinforcement strategies (e.g., “you praise your child if he/she behaves well”; 6 items) with their child, $\alpha = 0.79$. The global negative dimension includes the parents’ self-reported frequency of using corporal punishment (e.g., “you spank your child with your hand when he/she has done something wrong”; 10 items), having poor monitoring (e.g., “your child is at home without adult supervision”; 10 items) and being inconsistent in their discipline (e.g., “the punishment you give your child depends on your mood”; 6 items) with their child, $\alpha = 0.69$. A higher score on the global negative parenting dimension relates to more negative parenting behaviors, whereas a higher score on the global positive dimension relates to more positive parenting behaviors.

NEO five-factor inventory-3

The NEO-FFI-3 was used to assess parental neuroticism, which was included as a covariate in each of the analytic models (NEO-FFI-3; McCrae and Costa 2010). The NEO-FFI-3 is a 60-item self-report questionnaire that measures five domains of personality (neuroticism, extraversion, openness, agreeableness and conscientiousness). All items were self-rated on a 5-point Likert-scale (1 = strongly disagree and 5 = strongly agree). The neuroticism scale includes twelve items ($\alpha = 0.85$). We specifically included parental

neuroticism (e.g., “At times I have felt bitter and resentful”) given its association with not only offspring negative affect but also parental behavior as well (Coplan et al. 2009).

Statistical Analyses

Multiple linear regressions were modeled to examine the association between parental behaviors (i.e., negative and positive parenting from the APQ), child negative affect from the CBQ, and their respective interactions on the total ICU score (i.e., composite of uncaring, callousness, and unemotional dimensions) as well as on individual ICU dimensions (i.e., unemotionality, callousness, uncaring). All variables were mean-centered. Interaction terms for positive and negative parenting behavior with negative affect were included in the same models. Given that child negative affect is associated with parental neuroticism (Kim et al. 2001) and their gender (Else-Quest et al. 2006), we covaried both of these effects in all models. Furthermore, negative and positive parenting dimensions are not mutually exclusive, as a parent could display high levels of both positive and negative parenting behaviors simultaneously (Li 2018). Thus, both positive and negative parenting variables were included in the same regression models, including interaction terms¹. Thus, all models included the following mean-centered variables: parent neuroticism, child gender, CBQ negative affect, APQ positive parenting, APQ negative parenting, the interaction between CBQ negative affect and APQ negative parenting, and the interaction between CBQ negative affect and APQ positive parenting. We included the partial η^2 for each model (i.e., the ratio of variance accounted for by the independent variables in the model, plus their associated error variances). Values of 0.01, 0.06, and 0.14 reflect small, medium, and large effect sizes, respectively (Cohen 1988).

Results

Correlations, Means and Standard Deviations

Bivariate correlations and descriptive information for all study variables are included in Table 1.

ICU Total Scores

All models for the ICU dimensions, including the total score and subscales, are presented in Table 2. Child negative affect was not associated to total ICU, $b = 0.08$, 95% CI = -0.04 , 0.21, partial $\eta^2 = 0.01$. Positive parenting was negatively

¹ As requested by a reviewer, we provided results in the supplemental materials (i.e., Supplemental Tables 1 and 2) that modeled these associations without covarying for the “off” parenting variables.

Table 2 Multiple regression models of negative and positive parenting and child negative affect on CU dimensions

	Variables	<i>b</i>	<i>t</i>	s.e.	<i>p</i>	95% CI
ICU total	Parent neuroticism	0.08	1.27	0.06	0.20	−0.04, 0.21
	Child sex	1.95	2.13	0.92	0.03	0.14, 3.75
	CBQ negative affect	0.08	1.22	0.06	0.22	−0.05, 0.20
	APQ positive parenting	−0.25	−3.02	0.09	<0.01	−0.42, −0.08
	APQ negative parenting	0.27	2.36	0.11	0.02	0.04, 0.49
	Positive parenting × negative affect	−0.02	−1.99	0.01	0.04	−0.04, 0.00
	Negative parenting × negative affect	0.04	2.63	0.01	<0.01	0.01, 0.06
Callousness	Parent neuroticism	0.08	0.47	0.02	0.64	−0.04, 0.06
	Child sex	0.02	0.13	0.02	0.89	−0.66, 0.75
	CBQ negative affect	0.49	2.54	0.03	0.01	0.01, 0.11
	APQ positive parenting	−0.10	−0.57	0.03	0.57	−0.08, 0.04
	APQ negative parenting	0.43	2.15	0.04	0.03	0.01, 0.18
	Positive parenting × negative affect	−0.38	−2.07	0.00	0.04	−0.01, 0.00
	Negative parenting × negative affect	0.31	1.76	0.00	0.07	−0.00, 0.02
Unemotional	Parent neuroticism	0.29	1.75	0.02	0.08	−0.00, 0.08
	Child sex	0.26	1.64	0.32	0.10	−0.11, 1.14
	CBQ negative affect	−0.26	−1.55	0.02	0.12	−0.07, 0.01
	APQ positive parenting	−0.43	−2.70	0.03	<0.01	−0.14, −0.02
	APQ negative parenting	−0.17	−0.98	0.04	0.33	−0.11, 0.04
	Positive parenting × negative affect	−0.07	−0.43	0.00	0.66	−0.01, 0.00
	Negative parenting × negative affect	0.24	1.58	0.00	0.11	−0.00, 0.02
Uncaring	Parent neuroticism	0.15	0.52	0.04	0.60	−0.05, 0.09
	Child sex	0.26	0.96	0.54	0.33	−0.54, 1.58
	CBQ negative affect	0.55	1.91	0.04	0.05	−0.00, 0.14
	APQ positive parenting	−0.57	−2.15	0.05	0.03	−0.20, −0.01
	APQ negative parenting	0.50	1.67	0.08	0.09	−0.02, 0.24
	Positive parenting × negative affect	−0.45	−1.63	0.01	0.10	−0.02, 0.00
	Negative parenting × negative affect	0.52	2.00	0.01	0.04	0.01, 0.03

associated with total ICU, $b = -0.25$, 95% CI = $-0.42, -0.08$, partial $\eta^2 = 0.05$, whereas negative parenting was positively associated, $b = 0.27$, 95% CI = $0.04, 0.49$, partial $\eta^2 = 0.03$. No interaction was observed between positive parenting and child negative affect, $b = -0.02$, 95% CI = $-0.04, 0.00$, partial $\eta^2 = 0.02$. However, there was an interaction between negative parenting and child negative affect, $b = 0.04$, 95% CI = $0.01, 0.06$, partial $\eta^2 = 0.04$. A post hoc test of the interaction between negative affect and negative parenting revealed that negative parenting was only associated with higher total CU among children with high levels of negative affect (i.e., above the median), $b = -0.18$, 95% CI = $0.27, 0.95$, partial $\eta^2 = 0.12$, but not among children with low (i.e., below the median) negative affect, $b = 0.05$, 95% CI = $-0.28, 0.28$, partial $\eta^2 = 0.00$.

ICU Callousness

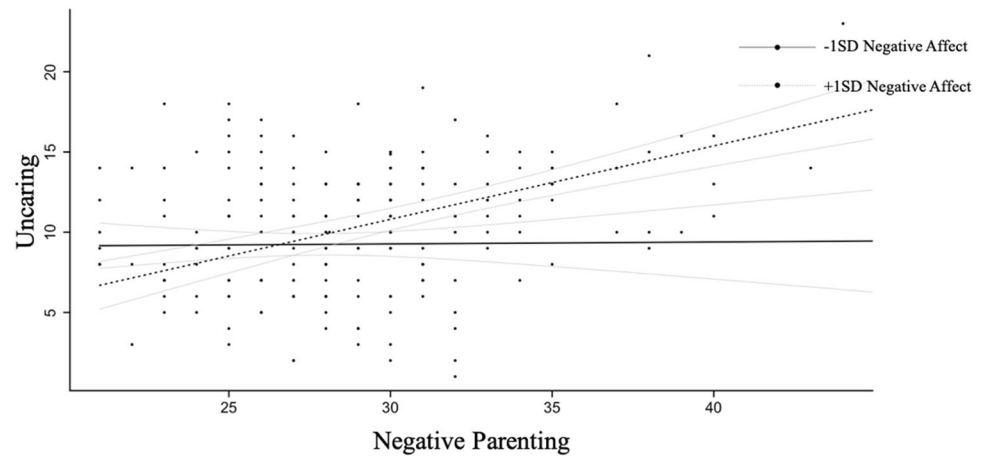
Child negative affect was positively associated ICU callousness, $b = 0.49$, 95% CI = $0.01, 0.11$, partial $\eta^2 = 0.03$.

While there was no association between positive parenting and ICU callousness, $b = -0.10$, 95% CI = $-0.08, 0.04$, partial $\eta^2 = 0.001$, negative parenting was positively associated with ICU callousness, $b = 0.43$, 95% CI = $0.01, 0.18$, partial $\eta^2 = 0.03$. No interactions emerged between negative affect and positive parenting, $b = -0.38$, 95% CI = $-0.01, 0.00$, partial $\eta^2 = 0.02$ or between negative affect and negative parenting, $b = 0.31$, 95% CI = $0.00, 0.02$, partial $\eta^2 = 0.02$ as they pertained to ICU callousness.

ICU Unemotionality

There was no association between child negative affect and ICU unemotionality, $b = -0.26$, 95% CI = $-0.07, 0.01$, partial $\eta^2 = 0.01$. There was, however, an inverse association between positive parenting and ICU unemotionality, $b = -0.43$, 95% CI = $-0.14, -0.02$, partial $\eta^2 = 0.04$, but no association between negative parenting and ICU unemotionality, $b = -0.17$, 95% CI = $-0.11, 0.04$, partial $\eta^2 = 0.005$. Finally, no interactions emerged between

Fig. 1 Interaction between negative parenting behaviors and child negative affect on ICU uncaring



positive, $b = -0.07$, 95% CI = $-0.01, 0.00$, partial $\eta^2 = 0.001$, or negative parenting, $b = 0.24$, 95% CI = $0.00, 0.02$, partial $\eta^2 = 0.01$ with negative affect as they pertained to ICU unemotionality.

ICU Uncaring

Negative affect was not associated with ICU uncaring, $b = 0.15$, 95% CI = $0.00, 0.14$, partial $\eta^2 = 0.01$. Positive parenting was negatively associated with ICU uncaring, $b = -0.57$, 95% CI = $-0.20, -0.01$, partial $\eta^2 = 0.03$, although negative parenting was not associated with ICU uncaring, $b = 0.50$, 95% CI = $-0.20, 0.24$, partial $\eta^2 = 0.01$. No interaction was detected between negative affect and positive parenting, $b = -0.45$, 95% CI = $-0.02, 0.00$, partial $\eta^2 = 0.01$. However, an interaction was detected between negative affect and negative parenting, $b = 0.52$, 95% CI = $0.01, 0.03$, partial $\eta^2 = 0.02$ (see Fig. 1). A post hoc test of this interaction revealed that negative parenting was only associated with higher levels of ICU uncaring among children with high levels of negative affect (i.e., above the median), $b = 0.26$, 95% CI = $0.20, 0.61$, partial $\eta^2 = 0.07$, but not among children with low negative affect, $b = 0.06$, 95% CI = $-0.14, 0.19$, partial $\eta^2 = 0.00$.

Discussion

The current study examined the associations between child negative affect, parenting behaviors and children's CU traits in a cross-sectional sample of 5–6-year-old children. After controlling for concurrent types parenting behaviors (i.e., both negative and positive parenting), positive parenting was negatively associated with total ICU scores, whereas negative parenting was positively associated. Furthermore, negative parenting behavior was specifically associated with higher levels of children's total ICU scores, but only among children with high negative affect. This interactive effect

was specific to the uncaring dimension of the ICU. These results are preliminary (given the cross-sectional design and fairly limited size) and require replication, but they suggest that the effects of parenting behavior on CU traits in children may be modulated by individual differences in children's temperament (Li 2018).

First, negative affect was not consistently associated with CU traits as expected. We found that higher child negative affect was only associated with ICU callousness, but not the other dimensions of CU. Unfortunately, given the cross-sectional nature of the current study the direction of this association could not be disentangled at this time. However, previous studies that have shown that children's negative affect is prospectively associated with adult psychopathic traits (Hale et al. 2004; Hicks et al. 2004; Sellbom 2015), suggesting that negative affect may be associated with later psychopathy via early childhood callousness. The current findings provide compelling grounds to test the hypothesis that children's temperament, and negative affect in particular, may be a plausible early risk factor in etiological models underlying CU in children and later psychopathy in adults.

Second, we found that children with high negative affect were more sensitive to negative parenting behaviors (as opposed to positive parenting behaviors) in terms of showing greater uncaring traits than those with low negative affect. The specificity of the effects of negative affect and negative parenting on uncaring in children coincide with prior research showing that the uncaring dimension of CU may be a robust predictor of adult psychopathy and other negative outcomes in later life (Feilhauer et al. 2012; Fink et al. 2012). Additionally, our results provide preliminary support for the notion that individual differences in children's temperament may influence how they respond to parenting, specifically (Kiel and Buss 2011; Li and Lee 2012; Sanson and Prior 1999). For instance, a recent study showed that children exhibiting greater reward responsivity were more behaviorally sensitive (in terms of their ADHD

symptomatology) to the effects of negative parental behavior (but also positive parenting) than those with lower reward responsivity (Li 2018). It is possible that children's negative affect may also increase their sensitivity to negative or harsh environments (with respect to negative parenting and its relationship to children's uncaring), although it should be noted that others have shown that negative affect might also *increase* sensitivity to environmental enrichment as well (i.e., differential susceptibility theory) (Belsky et al. 2007; Pluess et al. 2018; van Zeijl et al. 2007). Although our study did not find evidence in support of differential susceptibility with respect to children's negative affect, one possibility in explaining our findings is that the rewarding aspects of positive parental behavior (e.g., frequency of praise or other forms of positive reinforcement) may have been out-weighed by the harmful aspects of negative parental behaviors (e.g., harsh discipline, inconsistent discipline, neglect or lack of supervision) as assessed by the APQ. For instance, parents who provide praise to their children in sincere and specific ways have a greater positive impact on their children's behavior than when they simply provide them with praise frequently (Henderlong and Lepper 2002; Li 2018). Future work can address some of the limitations of relying on self-report for parenting behavior by employing multiple measures of parenting behavior (e.g., observations, ecological momentary assessments) across a variety of contexts (e.g., at home and in the laboratory setting) (Li and Lansford 2018).

The current study has some limitations worth noting. First, we utilized cross-sectional data, thus limiting our ability to make strong inferences regarding the directionality of the effects reported herein. Furthermore, the variables measured in this investigation relied on parent-reports, which could introduce reporter bias or shared method variance. For instance, parents may have been motivated to self-report their parenting behaviors in a socially desirable way and under report on their negative parenting. This concern was somewhat mitigated by controlling for parental neuroticism, which is known to be associated with self-reporting characteristics. However, we could not account for all possible factors that may have led to such biases. Our future work will employ multiple methods (e.g., observations and self-reports of parenting behavior) and query from multiple informants (i.e., parent and teacher measures of CU traits and temperament) to address this limitation. Second, despite employing a well-characterized dataset of 5–6 year-old children, the results stemming from our findings will need to be replicated in larger samples in order to make firm conclusions about the nature of the relationships between parenting, negative affect, and the dimensions of CU. Third, we only focused on unidirectional relationships with parenting, even though parent-child dynamics are transactional (Theule et al. 2010) such that children with high CU traits

may potentially elicit more negative (and less positive) parenting as well. Longitudinal data are currently being collected to disentangle child effects from parent effects. Finally, the sample was only representative of the surrounding community (i.e., a mid-sized city in the midwestern part of the United States) but unrepresentative of the general population. Thus, the current results may lack generalizability and will need to be replicated in more diverse populations.

We conclude by noting a few clinical implications from the current study. Children with “difficult temperaments” may be especially sensitive to parenting and family-based interventions. Interventions for this subgroup of children could include focusing on teaching emotion regulation strategies to improve their ability to positively interact with their environment, such as in the context of poor parenting. Future intervention studies may wish to differentiate children with high and low levels of negative affect to determine if parenting interventions may have differential effects on child behavior. Similarly, future studies can examine how specific types of parental intervention differentially influence children's CU traits and how they pertain to future outcomes, such as psychopathy.

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Compliance with Ethical Standards

Conflict of Interest The authors declare that they have no conflict of interest.

Ethical Approval This research was approved by the University of Wisconsin-Madison's Education and Social/Behavioral Science Institutional Review Board (IRB #2015-1177). The study was performed in accordance with the ethical standards as laid down in the 1964 Declaration of Helsinki and its later amendments or comparable ethical standards.

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