UNIQUE AND COMBINED CONTRIBUTIONS OF CALLOUS-UNEMOTIONAL TRAITS AND PARENTAL INCARCERATION ON JUVENILE DELINQUENCY IN AN AT-RISK SAMPLE

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Research suggests that both callous-unemotional (CU) traits and history of parental incarceration are predictors of juvenile delinquency. However, their interaction in association with such behaviors has yet to be investigated. Participants were 213 adolescents (201 males, 12 females) ranging in age from 16 to 19 enrolled in a residential program. Higher levels of overall CU traits were related to juvenile delinquency, and parental incarceration was associated with higher delinquency among adolescents with relatively low levels of CU traits. Consistent with prior research, CU traits may indicate risk of engaging in juvenile delinquency, yet parental incarceration may be particularly relevant for youth low in CU traits. Implications and issues for further research are discussed.

Keywords: psychopathy, parental incarceration, delinquency, adolescent, callous-unemotional traits

Callous-unemotional (CU) traits delineate a subgroup of youth who are most likely to engage in stable, severe, and varied antisocial behavior (see Frick, Ray, Thornton, & Kahn, 2014 for a review; Muñoz, Pakalniskiene, & Frick, 2011). Although some delinquent behavior is considered normative in adolescence (Bacon, Paternoster, & Brame, 2009), CU traits help distinguish adolescents who have a particularly severe pattern of conduct problems (Lawing, Frick, & Cruise, 2010) and who continue engaging in antisocial behavior from adolescents who are more likely to cease antisocial behavior (Byrd, Loeber, & Pardini, 2012; Frick, Cornell, Barry, Bodin, & Dane, 2003).

Empirical evidence suggests a number of explanations for why CU traits are an important predictor of juvenile delinquency. Callous-unemotional traits include a lack of remorse for actions, lack of concern for others' feelings, reduced concern for punishment associated with problematic behaviors, and a lack of emotional expression (Frick, 2009; Pardini, Lochman, & Frick, 2003). Therefore, these tendencies might promote persistent engagement in behaviors that are oriented toward personal desires or rewards without concern for how the behavior impacts others or society in general. Further, an orienta-

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tion toward the rewards of antisocial behavior or a limited responsiveness to punishment cues may contribute to the connection between CU traits and youth behavioral problems (Guelker, Barry, Barry, & Malkin, 2014; Pardini et al., 2003). Still, it is important to note that despite the association between CU traits and conduct problems in youth, the presence of CU traits is not synonymous with conduct disorder (CD).

Callous-Unemotional traits can be further described in terms of three specific dimensions (i.e., uncaring, callousness, unemotionality). Uncaring is represented by a lack of motivation and effort in common tasks, and these characteristics have been associated with unique variance in adolescent delinquency (Ansel, Barry, Gillen, & Herrington, 2015). Callousness includes a lack of empathy or remorse and a disregard for others and has shown significant relations with aggression (e.g., Ansel et al., 2015; Pardini & Byrd, 2012). Unemotionality reflects a constricted range of emotion and lack of affective expression (Frick, 2009) and has not shown the same clear connections to youth antisocial behavior (e.g., Kimonis et al., 2008).

Longitudinal research found that CU traits at age seven predicted violent and criminal behavior at age 25 after controlling for childhood CD, attention deficit hyperactivity disorder (ADHD), and oppositional defiant disorder (ODD; Byrd et al., 2012). Further, CU traits predicted conduct problems and violent offending after controlling for past conduct problems and violent offending (Chauhan et al., 2014). CU traits also have shown predictive validity for violent recidivism and versatility of delinquency after controlling for age at first arrest and number of past offenses (Basque, Toupin, & Cote, 2013). However, one study found that CU traits did not predict recidivism after controlling for age at first arrest, number of prior arrests, and impulsivity (Colins, Vermeiren, De Bolle, & Broekaert, 2012), indicating some importance of developmental timing in the connection between CU traits and behavioral problems. Nevertheless, because CU traits have been associated with the early onset of antisocial behavior, (Frick et al., 2014) including age at first charge (Bauer, Whitman, & Kosson, 2011), they appear to have significant behavioral relevance prior to adulthood. Thus, existing evidence indicates that youth with CU traits may not only be more likely than youth without CU traits to engage in delinquent behaviors, but they are also more likely to repeat those behaviors, making further understanding of the development of CU traits and the contextual factors that heighten their associated behavioral risks necessary.

Because CU traits may be amenable to certain treatments in youth but harder to treat in adults (Hawes, Dadds, Frost, & Hasking, 2011), it is important to identify these features early, along with other potential influential environmental factors, to provide appropriate and timely intervention (Caldwell, Skeem, Salekin, & Van Rybroek, 2006). For example, research suggests that having a parent who is incarcerated is associated with juvenile delinquent behavior, yet this relation has not been explored in the context of youth personality factors such as CU traits that may play a role in the initiation or maintenance of delinquency (Aaron & Dallaire, 2010; Murray, Farrington, & Sekol, 2012).

In short, the purpose of this study was to examine the relation between CU traits, parental incarceration, and juvenile delinquency. Specifically, it examined both CU traits

and parental incarceration as predictors of unique variance in juvenile delinquency and whether the combination of both factors is associated with a higher level of delinquency. The present study also considered whether such a model was relevant for adolescents with an earlier versus later onset of delinquent behavior. Such investigations are important for further understanding whether known personality risk factors interact with adverse familial events to increase the likelihood of antisocial behavior prior to adulthood.

Parental Incarceration and Juvenile Delinquency

Ample research shows a connection between a history of parental incarceration and juvenile delinquency; however, the nature of this relation is complex (Turney & Wildeman, 2015). The United States has higher rates of imprisonment than any other country (Walmsley, 2013); additionally, approximately 53% of the nation's prisoners are parents of children under the age of 18, with a disproproniate number of incarcerated women being mothers (Glaze & Maruschak, 2010). Overall, approximately 2.3% of the U.S. adolescent population has a parent who is currently incarcerated (Glaze & Maruschak, 2010), and the percentage of children who have an incarcerated parent increased by 80% between 1991 and 2007. Further, it was estimated that one out of every 25 Caucasian children and one out of every four African-American children born in the year 1990 had a parent incarcerated by the age of 14 (Walmsley, 2009). It is clear, then, that parental incarceration affects a significant and growing proportion of youth at some point prior to adulthood.

There are numerous potential negative outcomes of having experienced parental incarceration, which include both externalizing and internalizing problems (see Aaron & Dallaire, 2010; Murray et al., 2012), as well as economic and residential instability (Geller, Garfinkel, Cooper, & Miney, 2009). Maladaptive behavioral outcomes include delinquency, drug use, and contact with the criminal justice system (Byrd et al., 2012; Miller & Barnes, 2015; Murray, Loeber, & Pardini, 2012), with parental incarceration predicting juvenile delinquency over and above the child's demographic characteristics and other risk factors such as poverty and substance abuse (Aaron & Dallaire, 2010). Paternal incarceration has been associated with an increased risk of sons' delinquency and arrests across White, Black, and Hispanic youth (Roettger & Swisher, 2011), and maternal incarceration has been associated with re-arrest among youth with prior offenses (Tasca, Rodriguez, & Zatz, 2011). In a meta-analysis encompassing 40 studies, parental incarceration was related to a higher risk of a child's antisocial behavior, although findings concerning some outcomes such as drug use, mental health problems, or poor educational performance for children were inconclusive (Murray et al., 2012).

Parental Incarceration and CU Traits

A more comprehensive model of risk for juvenile delinquency may help elucidate specific individual and environmental contributing factors. Specifically, by focusing on parental incarceration and CU traits separately, previous research may have missed their potential combined impact in predicting juvenile delinquency. Such a multiple risk model is important for informing the next wave of prevention and intervention efforts targeted toward those youth who, from an evidence-based standpoint, are most at-risk for delinquent activity.

There are several ways in which CU traits and parental incarceration may be related to each other, including heritable factors and criminal modeling. For example, concentration of crime within a family is common, with fewer than 10% of the families in any community accounting for more than 50% of that community's crime (Moffitt, 2005). Although it has been estimated that genetic heritability may influence 40 to 50% of population variance in antisocial behavior, it does not appear to be the only influence, as proximal environmental factors shared by family members are estimated to account for 15% to 20% of population variance in antisocial behavior (Rhee & Waldman, 2002). That is, although an individual may possess a genetic predisposition to antisocial behavior or CU traits, his or her environment is likely influential in the manifestation of those traits (Barker, Oliver, Viding, Salekin, & Maughan, 2011; Hawes et al., 2011). For instance, maternal CU traits have been associated with child CU traits; however, this relation was mediated by parenting dysfunction (i.e., overly harsh, inconsistent, and/or uninvolved parenting; Loney, Taylor, Butler, & Iacono, 2007). Therefore, in terms of the present investigation, the combination of elevated CU traits and a parent or primary caregiver who is incarcerated may be indicative of a group of adolescents at high-risk of delinquency, particularly when compared to youth with CU traits who have not experienced parental incarceration.

Age of Onset of Problem Behaviors

Age of onset of behavioral problems is another important factor for understanding the course of delinquent behavior from youth into adulthood and also may play a role in predicting risk for adolescent delinquency for youth with CU traits and those who have experienced a parental incarceration. Moffitt (1993) proposed two distinct trajectories by which antisocial or delinquent behavior may develop. Life course persistent antisocial behavior is believed to emerge early in childhood, have a neurological or genetic basis, and persist throughout adolescence and adulthood. Additionally, research suggests that both neuropsychological and environmental factors play a role in the development and maintenance of life course persistent antisocial behavior. In contrast, adolescent-limited antisocial behavior is viewed as part of a normative developmental pathway in adolescence and is particularly influenced by contextual factors, such as delinquent peer affiliations and available alternatives to crime (Moffitt, 1993). This trajectory of conduct problems tends to peak in adolescence and diminish with age. A wealth of evidence suggests that early childhood problem behavior is predictive of persistent and relatively severe adolescent and adult criminal behavior (e.g., Colins et al., 2012; Tremblay, Pihl, Vitaro, & Dobkin, 1994). CU traits appear to be more prominent in the early onset pathway (see Frick et al., 2014), again suggesting their relevance for persistent antisocial behavior in youth.

Therefore, in addition to CU traits and parental incarceration, early onset of delinquency may be an important predictor in the proposed model. As both CU traits and parental incarceration are relevant for delinquency in adolescence, individuals who have an early age of onset of delinquency, accompanied by both CU traits and a history of parental incarceration, may demonstrate the highest risk for delinquency and also may be most at-risk for future negative consequences, such as incarceration.

Hypotheses

It was hypothesized that overall levels of CU traits and the specific dimensions of callousness and uncaring would be positively associated with self-reported juvenile delinquency (Hypothesis 1). Additionally, it was hypothesized that parental and/or primary caregiver incarceration would be related to juvenile delinquency (Hypothesis 2). It was hypothesized that a history of parental and/or primary caregiver incarceration would moderate the expected association between CU traits and juvenile delinquency, such that a history of parental and/or primary caregiver incarceration would strengthen the relation (Hypothesis 3). Additionally, it was hypothesized that age of onset of delinquent behaviors would act as a further moderator in this model, such that an earlier age of onset would strengthen the connection between CU traits, parental incarceration, and delinquency (Hypothesis 4). Parental psychopathy was examined as a potential control variable for the above hypotheses.

METHOD

Participants

Participants were 213 adolescents who had completed self-report and matching parent data. Participants were recruited from a military style, residential program. Individuals attending this program do so voluntarily and have no current legal system involvement at the time of enrollment. The program serves youth who have dropped out of school for a variety of academic, behavioral, financial, or psychosocial reasons. The sample consisted primarily of male participants (201 males, 12 females), which reflects the predominantly male program enrollment, and participants ranged in age from 16 to 19 years (M = 16.92; SD = .77). The majority of participants (65.7%) were White, 27.7% were Black, and 1% were classified as being from "Other" ethnic/racial backgrounds. Twelve participants (5.6 %) did not report their ethnic/racial background.

Materials: Parental Measures

Incarceration. Parents/guardians completed a form that provided information regarding parent or primary caregiver incarceration history and type of offense related to any incarceration. Specifically, two items (i.e., "Has either parent of this child ever been incarcerated longer than overnight following an arrest?" and "Has any primary caregiver of this child ever been incarcerated longer than overnight following an arrest?") assessing the previous incidence of incarceration, dichotomized as present versus not present, were used to test Hypotheses 2, 3, and 4. The primary caregiver item inquired whether parents *or* a different primary caregiver had ever been incarcerated, whereas the parent item referred to parents only. Thus, parental incarceration was subsumed under the caregiver item, and both items were considered in the tests of our hypotheses.

Psychopathic Personality Inventory Short Form (PPI-SF; Lilienfeld & Hess, 2001) The Psychopathic Personality Inventory Short Form (PPI-SF) is a 56-item adult, self-report measure of personality traits indicative of psychopathy. It was developed as a shorter alternative to the original Psychopathic Personality Inventory (PPI; Lilienfeld & Andrews, 1996) to assess psychopathy in non-institutionalized populations. Psychopathic Personality Inventory scores have demonstrated good internal consistency, test-retest

reliability within a 30-day time frame and construct validity in undergraduate samples (Lilienfeld & Andrews, 1996). The PPI-SF is believed to accurately assess psychopathy in a community population of adults (Kastner, Sellbom, & Lilienfeld, 2012). Total score internal consistency was α = .73 in the present sample.

Materials: Adolescent Measures

Inventory of Callous-Unemotional Traits (ICU; Frick, 2004). The ICU is a 24-item, self-report measure assessing CU traits, such as lack of empathy or guilt and flat affect. It was developed from the Callous-Unemotional (CU) scale of the Antisocial Process Screening Device (APSD; Frick & Hare, 2001), an instrument widely used to study psychopathy-linked characteristics in children and adolescents. Responses range from 0 (*not at all true*) to 3 (*definitely true*). The ICU consists of three scales: Callousness (e.g., "I do not care who I hurt to get what I want"); Uncaring ("I always try my best"-reverse scored); and Unemotional (e.g., "I do not show my emotions to others"). Essau, Sasagawa, and Frick (2006) found a three-factor bifactor structure of Callousness, Uncaring, and Unemotional in a sample of 13 to 18 year-old adolescents. Overall internal consistency for scores on the ICU was α = .76 in the present sample, with coefficients of .78, .61, and .55 for the Uncaring, Callousness, and Unemotional scales, respectively.

Self-Report of Delinquency (SRD; Elliott, Huizinga & Ageton, 1985). The SRD is a self-report measure that lists 34 illegal acts, involving violent, property, drug, and status offenses. The SRD was derived from the offenses reported in the Uniform Crime Report which had a juvenile base rate greater than 1% at the time of its development. *Yes* or *no* responses indicate whether the participant has ever engaged in the specific act (e.g., "Have you ever purposely damaged or destroyed property belonging to your parents or other family members?"). The total score represents the number of different offenses reported, with a possible range of 0 to 34, and served as the measure of juvenile delinquency. Internal consistency for the total score was α = .91 for the current study. Additionally, for each *yes* response, participants were asked to indicate their age the first time that they engaged in that specific behavior, thereby providing their age of onset for delinquent behaviors. For adolescents reporting more than one offense, the youngest age of onset reported was used for analyses.

Procedure

This study was approved by the Institutional Review Board (IRB) at the first author's affiliated university. Upon their child's entrance into the residential program, all parents/guardians were invited to participate. Approximately 63.4% of parents/guardians approached (n = 279) agreed to participate. Parents provided written consent for their participation and then completed the Incarceration History and PPI-SF. Parents of adolescents under the age of 18 were provided with the option to refuse for their child to be contacted regarding the study. At that point, consenting parents were assigned a participant number and provided their son's/daughter's name who then also was assigned the same participant number. Because of program scheduling and other logistics, adolescent data collection occurred approximately six weeks later. Adolescents who agreed to participate provided informed consent if they were age 18 or above and assent if they were under age 18. Their data were matched to their parents' data via the randomly assigned participant

number. Adolescent participation or refusal in no way affected their status in the program. Adolescents completed measures (i.e., ICU and SRD) as part of a larger project in classroom settings in groups of approximately 12 to 18 participants. Of the 408 adolescents who were invited to participate, 293 (71.8%) agreed to do so, with 213 both agreeing to participate and having matching parent data, representing a 52% response rate relative to the total program enrollment. Because adolescents may have withdrawn or been removed from the residential program by the time of adolescent data collection, or because they may have declined to participate, detailed information regarding adolescents whose parents participated but who themselves did not (n = 80) is unavailable.

Analyses

Hypotheses 1 and 2 were tested using correlational analyses. Moderated multiple regression was conducted to examine the moderating effects of parental incarceration (Hypothesis 3). Specifically, PROCESS version 2.04 (Hayes, 2013) was used to test the moderating role of parental incarceration on the relation between CU traits and juvenile delinquency. The predictors for this analysis were centered to assist in the interpretation of the interaction term. The first step of the model included overall CU traits and the dichotomized history of parental incarceration (i.e., *yes* or *no*) as predictors. The second step included the two-way interaction term between history of parental incarceration and overall CU traits. The model then was repeated for each CU dimension individually. Finally, analyses were conducted to explore age of onset of delinquency as an additional factor in this model. Onset of delinquency was coded dichotomously as early (younger than age 10) or late (10 or older) based on the earliest reported age at which a participant engaged in one of the behaviors assessed by the SRD. Coding for early versus late onset of delinquency was based on the *Diagnostic and Statistical Manual of Mental Disorders* (DSM-5; American Psychiatric Association, 2013) subtypes for Conduct Disorder, which specifies either a childhood or adolescent onset. To test Hypothesis 4, age of onset was entered as an additional moderator in the regression model described above such that the second step included all two-way interactions, and the final step examined the three-way interaction between age of onset, CU traits, and parental incarceration history in predicting delinquency.

RESULTS

Descriptive statistics for all personality variables and for delinquency are shown in Table 1, with sample demographics reported in Table 2. Ninety-two (92) of 213 parent/guardian respondents (43%) reported a history of parental and/or caregiver incarceration. Eighty-six (86) respondents reported that a parent had been incarcerated, 6 reported that a caregiver had been incarcerated, and 6 reported that both a parent and a primary caregiver had been incarcerated. Forty-four (44) respondents indicated that a biological parent had been incarcerated (i.e., 8 maternal, 30 paternal, 6 both parents). As shown in Table 1, self-reported callousness was skewed positively and leptokurtic, indicating that most scores tended to cluster around the low end of the distribution, similar to findings with a similar sample of adolescents (Guelker et al., 2014). Two individuals scored > 4 *sd* above the sample mean on callousness; thus, analyses were conducted with and without these two participants (see below).

Table 1. Descriptive statistics for study variables.

Variable (possible range)	*M*	*SD*	*Minimum*	*Maximum*	*Skewness*	*Kurtosis*
Total CU traits (0-72)	27.6	8.18	9	50	.24	-.23
Callousness[a] (0-33)	8.7	4.17	0	29	1.16	2.83
Uncaring[a] (0-24)	10.23	4.58	0	24	.02	-.33
Unemotional[a] (0-15)	8.75	2.56	2	15	.42	-.01
Self-reported Delinquency[a] (0-34	12.05	7.17	0	32	.51	-.36
Parent/Caregiver Psychopathy (Total Score) (56-224)	115.66	15.61	41	155	-.69	2.92

[a]Prorated scores were used in analyses to help account for missing item responses.

Table 2. Demographic characteristics of the sample.

Demographic Variable	*N*	*Range*	*Mean*	*SD*	*Percentage*
Gender	211				
Male	199				94.3
Female	12				5.7
Age	211	16-19	17.93	.77	
Ethnicity	199				
White	138				65.4
Black	59				28.0
Other	2				1.0
Age of Onset	207				
< 10	99				47.8
> 10	108				51.2

Total Length of Parental/Caregiver Incarceration	*# of parent/caregivers*	*% of parent/caregivers of the total sample*
< 6 months	12	5.6
6 months to 1 year	3	1.4
1 – 3 years	14	6.6
3 – 5 years	4	1.9
5 – 10 years	10	4.7
> 10 years	4	1.9
Total	47	22.1

Note: Ethnicity was not reported by 12 participants. Four participants did not provide the age at which they first engaged in any reported delinquent acts. Forty-five (45) of the parent/guardian respondents who indicated a history of parental/caregiver incarceration did not provide information on the total length of incarceration.

Gender was not correlated significantly with delinquency nor with any other study variables; however, the sample was overwhelmingly male, so there was little variance in gender to detect such an effect. Adolescents' age was correlated negatively with self-reported delinquency, $r = -.16$, $p = .02$, such that an older age was associated with lower levels of self-reported delinquency. Therefore, age was controlled for during all regression analyses.[1] Age was not correlated with any other study variable. In addition, because parental psychopathy was not correlated with any variable of interest (see Table 3), it was not included as a control variable in subsequent analyses.

Table 3. Correlations among Study Variables

	1.	2.	3.	4.	5.	6.	7.	8.	9.
1. Parental/Caregiver Incarceration	-	.94***	-.07	.04	-.06	.01	.08	.13	.12
2. Parent Only Incarceration		-	-.11	.04	-.06	.09	-.02	.14*	.12
3. Parental Psychopathy			-	-.05	.01	-.03	-.11	.01	.10
4. ICU total score				-	.54***	.78***	.39***	.28***	-.17*
5. Callousness					-	.07	.24***	.25**	-.15*
6. Uncaring						-	.03	.26***	-.14*
7. Unemotional							-	-.04	-.01
8. Delinquency								-	-.11
9. Age of Onset									-

*$p < .05$; **$p < .01$; *** $p < .001$

As shown in Table 3, overall self-reported CU traits were related positively to self-reported delinquency, $r = .28$, $p < .001$. Additionally, callousness and uncaring traits specifically were associated with delinquency, $r = .25$, $p = .001$, $r = .26$, $p < .001$, respectively. Therefore, Hypothesis 1 was supported. Removing the outliers on callousness did not change this correlation. A history of parental and primary caregiver incarceration grouped together was not associated significantly with either juvenile delinquency or CU traits. However, a history of parental incarceration only (i.e., excluding history of caregiver incarceration) was associated positively with delinquency, $r = .14$, $p = .04$, but not with CU traits. Therefore, Hypothesis 2 was supported partially. Parental incarceration only was the focus of subsequent analyses.

Regression analyses were conducted to test the remaining hypotheses. The first step of the initial regression model included overall CU traits and history of parental incarceration as predictors of juvenile delinquency. Models with significant interaction effects are shown in Table 4. There were significant main effects for both overall CU traits, $b = .24$,

1 Regression analyses predicting delinquency were repeated without controlling for age. The pattern of results did not change from those reported.

se = .06, $p < .001$, and history of parental incarceration, $b = 1.9$, *se* = .96, $p = .047$, R^2 for the model = .10, $p < .001$. The second step of the model included the interaction term for history of parental incarceration by overall CU traits which was significant, $b = -.23$, *se* = .12, $p = .049$. This interaction was plotted by entering the simple slopes of parental incarceration at high and low levels of CU traits (defined as $\pm$ 1 *sd* from the *mean*). This plot indicated that adolescents with relatively low CU traits as well as no history of parental incarceration reported the lowest levels of juvenile delinquency (see Figure 1); however, delinquency was significantly higher among adolescents with low CU traits who had experienced a parental incarceration.

Table 4. Multiple Regression Models with a Significant CU x Parental Incarceration Interaction for Predicting Delinquency.

	B (se)	*R^2 for Model*
Step 1: Main Effects		.12
Self-Reported CU Traits	.24 (.06)***	
Parental Incarceration History	1.9 (.96)*	
Step 2: Interaction		.14
Self-Reported CU Traits X Incarceration History	.23 (.12)*	
Change in R^2	.02*	
	B (se)	*R^2 for Model*
Step 1: Main Effects		.10
Self-Reported Uncaring Traits	.39 (.10)***	
Parental Incarceration History	.17 (.99)	
Step 2: Interaction		.12
Self-Reported Uncaring Traits X Incarceration History	-.45 (.22)*	
Change in R^2	.02*	

Note: Unstandardized effects are reported.
N = 213 *$p < .05$, **$p < .01$, *** $p < .001$

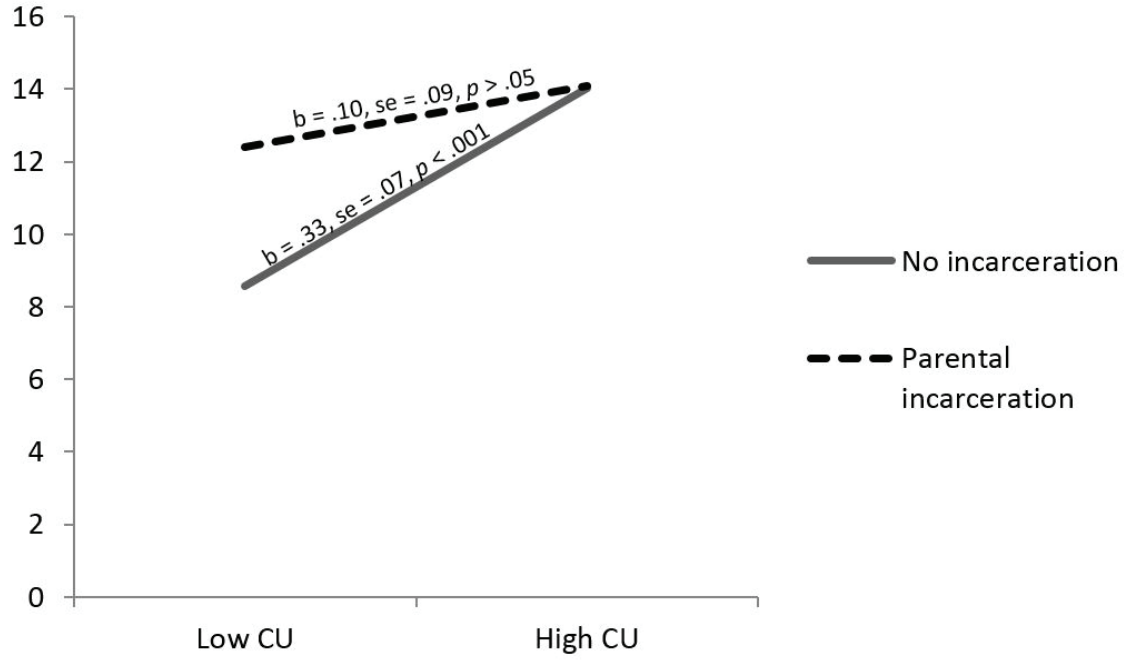

Figure 1. Interaction between Overall CU traits and Parental Incarceration as Predictors of Juvenile Delinquency

These regression models then were analyzed with the separate subscales of the ICU, beginning with the Uncaring subscale. There was a significant main effect for uncaring, $b = .39$, $se = .10$, $p < .001$, R^2 for the model = .10, $p < .001$, but not for a history of parental incarceration. The second step of the analysis included the two-way interaction term of parental incarceration history by self-reported uncaring as predictors of juvenile delinquency, with this term, $b = -.45$, $se = .22$, $p = .04$, explaining a significant increase in variance in self-reported delinquency, $\Delta R^2 = .02$, $p = .04$. As with the model for overall CU traits, this interaction was plotted and is shown in Figure 2. Again, this interaction was such that adolescents who reported relatively lower levels of uncaring as well as no history of parental incarceration tended to report the lowest levels of delinquent behavior with parental incarceration increasing the risk of delinquency among adolescents with low levels of uncaring traits.

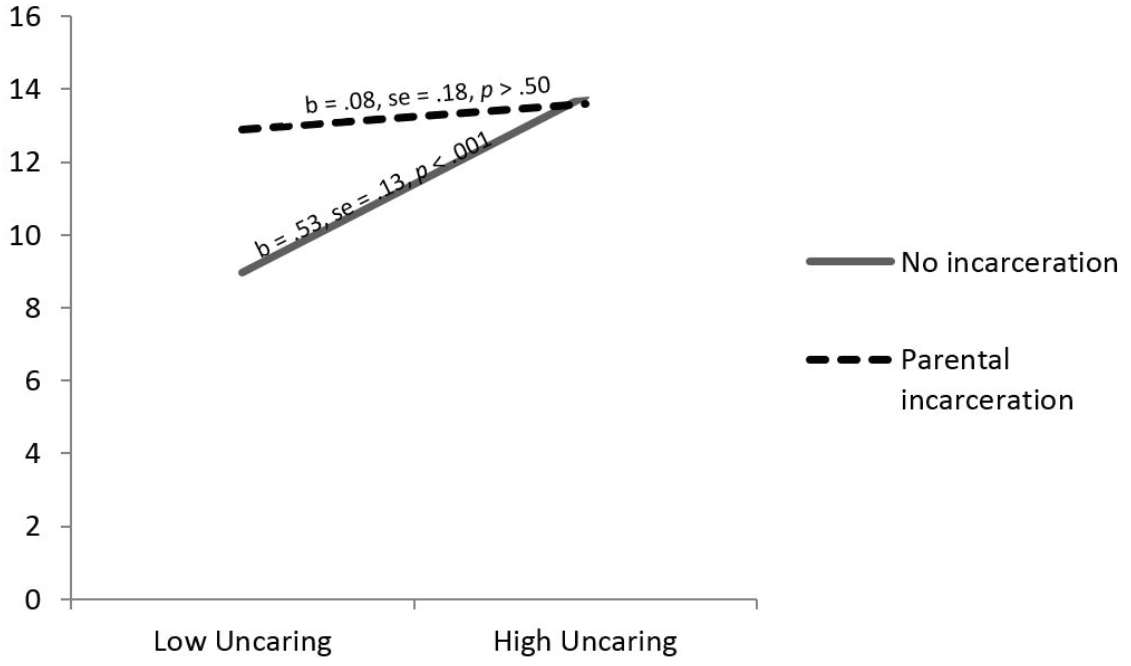

Figure 2. Interaction between Uncaring traits and Parental Incarceration as Predictors of Juvenile Delinquency

A regression model examining the Callousness subscale of the ICU was then conducted. Significant main effects were found for both parental incarceration history, $b = 2.3$, $se = .97$, $p = .02$, and self-reported callousness, $b = .40$, $se = .11$, $p = .001$, R^2 for the model = .08, $p < .001$. However, the interaction term between history of parental incarceration and self-reported callousness was not significant. Results were similar after removing the two outliers on callousness, as the main effects for incarceration history and callousness remained significant in the first step, R^2 for the model = .09, $p < .001$, but the interaction effect in the following step was not significant.

The model examining the Unemotional subscale of the ICU as a predictor yielded a significant main effect for parental incarceration history, $b = 2.07$, $se = 1.0$, $p = .04$, R^2 for the model = .02, $p = .10$, but not for unemotionality. The interaction between history of parental incarceration and self-reported unemotionality was not significant.

Finally, an additional regression model was analyzed using overall CU traits, history of parental incarceration, and age of onset of youth delinquency as predictors (see Table 5). The first step of this model included self-reported CU traits, age of onset, and history of parental incarceration as predictors and revealed significant main effects for parental incarceration, $b = 1.9$, $se = .96$, $p = .04$, and overall CU traits, $b = .21$, $se = .06$, $p < .001$, $R^2$for the model = .09, $p < .001$. The second step of the analysis included the two-way interaction terms between CU traits, age of onset, and history of parental incarceration with a significant interaction between parental incarceration history and overall CU traits, $b = -.25$, $se =$

.12, p =.04, ΔR^2 = .03, p < .001, again such that no history of parental incarceration coupled with low levels of CU traits predicted the lowest levels of juvenile delinquency. The third step of this model included the three-way interaction term between overall CU traits, age of onset, and history of parental incarceration; however, the three-way interaction effect was not significant.

Table 5. Overall CU traits, age of onset, and parental incarceration as predictors of juvenile delinquency

	B (se)	*R^2 for Model*
Step 1: Main Effects		.12
Self-Reported CU Traits	.21 (.06)***	
Parental Incarceration History	1.9 (.96)*	
Age of Onset	-1.1 (.96)	
Step 2: 2-way Interactions		
Age of Onset X Self-Reported CU traits	.21 (.12)	
Self-Reported CU Traits X Parental Incarceration History	-.25 (.12)*	
Age of Onset X Incarceration History	-.98 (1.9)	
Step 3: 3-way Interaction		.12
Age of Onset X Self-Reported CU traits X Incarceration History	.02 (.24)	
Change in R^2	.00	

Note: Unstandardized effects are reported.
N = 213 *p < .05, **p < .01, *** p < .001

***Post hoc* Analyses**

As there were only 12 females in the final sample, the above analyses were repeated excluding females. It should be noted that of the 12 females in the sample, 11 reportedly had experienced a history of parental incarceration; therefore, excluding females brought the sample size for those who had experienced parental incarceration from 92 to 81. In the analyses excluding females, high levels of CU traits overall, and high levels of uncaring traits specifically, remained associated with high levels of delinquency. However, a history of parental incarceration no longer predicted delinquency. The interaction between CU traits and parental incarceration was also nonsignificant for males only, as was the interaction between uncaring traits and parental incarceration. Thus, parental

incarceration appears to have been relatively less relevant for delinquent activity among the males in this sample.

DISCUSSION

The current study explored the contributions of adolescent CU traits and parental incarceration to delinquency in an at-risk sample. Both overall CU traits and a history of parental incarceration predicted unique variance in juvenile delinquency. Self-reported callous and uncaring traits were also unique predictors of delinquency, suggesting that a lack of concern for rules and for the rights and feelings of others constitutes particular risk for engaging in delinquent acts. Furthermore, individuals with lower levels of overall CU traits and no history of parental incarceration reported the lowest amounts of overall juvenile delinquency.

Therefore, in this study, there was no observed additive effect of having both high levels of CU traits and a history of parental incarceration. Instead, high levels of CU traits were associated with relatively high delinquency independent of a reported history of parental incarceration. This finding suggests that parental incarceration does not clearly influence delinquency among adolescents high in CU traits, but the pattern of results suggests that it may be tied to a higher relative risk of delinquency among adolescents with lower CU traits. In addition, adolescents who reported high levels of uncaring, independent of whether their parents had been incarcerated, tended to report relatively high levels of delinquency. However, similar to overall CU traits, adolescents who reported low levels of uncaring only exhibited higher levels of juvenile delinquency if they experienced a parental/caregiver incarceration.

The effects for CU traits overall and for callous and uncaring traits remained in the reduced sample excluding females. However, neither the main effect of parental incarceration, nor its interaction with CU/uncaring traits, predicted delinquency for males only. These findings likely are due to an even smaller sample of participants with a history of parental incarceration when female participants were excluded and also may speak to the interaction being more relevant for delinquent activity among the females in our specific sample. In addition, this pattern highlights that the interaction was not robust and emphasizes the connection of CU traits, and callous and uncaring traits in particular, to adolescent delinquency. There is a clear need for future research exploring a history of parental incarceration in conjunction with CU traits and their independent and combined effects in larger samples, including a larger female sample. Moreover, among adolescents lower in CU traits, familial factors such as parental incarceration may be particularly influential and in need of further study. Taken together, it appears that parental incarceration may be more impactful for individuals who lack certain intraindividual risk factors (e.g., CU traits, being male) for delinquency.

Previous research seems generally consistent with the present results. Among children low in CU traits, parent-reported distress was associated with higher conduct problems (Fanti & Centifanti, 2014). Similarly, harsh and inconsistent discipline are more clearly as-

sociated with conduct problems in youth who *do not* demonstrate affective deficits, such as lack of remorse, lack of empathy, and callousness, that are typically associated with psychopathy (Edens, Skopp, & Cahill, 2008). Thus, whereas parenting variables appear relevant for conduct problems among youth low in CU traits, evidence is mixed for those with high levels of CU traits. It has been demonstrated that there may be a bidirectional relation between CU traits and parenting, as well as evidence that familial factors play less of a role in problem behaviors within this subgroup (see Frick et al., 2014). To date, it is not clear how parental incarceration may be related to parental psychopathy and youth CU traits, any bidirectional or transactional effects that may exist in this relation, and in what specific ways it is related to youth delinquency. The findings reported here appear consistent with recent data suggesting that parental incarceration may be most uniquely maladaptive for children not already at-risk (Turney & Wildeman, 2015). Thus, one of the clearly emerging patterns is that the effects of parental incarceration on youth development are varied and incorporate a wide variety of risks factors beyond child dispositional factors such as CU traits (Arditti, 2015; Tasca et al., 2011).

Lastly, in the present study, age of onset of delinquent activity did not moderate the relation between parental incarceration history, CU traits, and delinquency. In addition, contrary to previous research, earlier age of onset for delinquency was not associated with higher levels of delinquency. This difference could reflect difficulties on the part of adolescent participants recalling or reporting previous delinquent acts retrospectively. Possible differences in how these factors examined in this study relate to different types of antisocial behavior, methodological issues involved in retrospective self-reports of age of onset, and the treatment relevance of the variables considered in the present study are in need of further attention.

Limitations

There are several limitations of this study that must be considered. First, participants were enrolled in a program for adolescents who have dropped out of school. This sample allows for examination of personality and parental/caregiver historical factors in a population that likely has engaged in a wider range of juvenile delinquency than the overall adolescent population. However, it limits generalizability to adolescents in different settings, including adjudicated adolescents for whom the risk factors examined in this study may be particularly salient. Additionally, the overwhelming majority of the adolescents in this sample were male, so it is unclear how these results would generalize to female adolescents, and the fact that almost all females in this sample had reportedly experienced parental incarceration indicates that this sample of females was not typical of female adolescents in general. The majority of our participants were White, which may not reflect the larger population of youth who are at-risk of having experienced parental incarceration (Walmsley, 2009), and the geographical area (i.e. southeastern United States) in which participants resided also may limit the generalizability of these findings. Thus, continued research is needed to determine the applicability of these findings to more diverse samples.

Further, this study relied on parent and adolescent self-report data. Although the data suggest that a history of parental incarceration and high levels of CU traits are each

predictive of higher levels of juvenile delinquency, examining data such as arrest records and collateral report of personality factors could strengthen confidence in interpreting the findings and perhaps provide more specific information regarding risk factors for delinquency. Inclusion of such information also would help mitigate any concerns regarding socially desirable responding that may have influenced participants' self-reports. Additionally, many parent/guardian respondents provided little of the requested information (e.g., length of incarceration, type of offense, relation of the individual incarcerated to the adolescent participant). The parental incarceration measure also was completed retrospectively and did not address the timing of the parental incarceration, which may be an important factor for the development of juvenile delinquency. Future research should utilize a variety of methods to extend the present study's findings and to guard against potential impression management influences on data.

Future Directions

This study further demonstrated the robustness of adolescent CU traits as a correlate of juvenile delinquency, as well as the relevance of parental incarceration, especially for children low in CU traits. Because type of offense was not examined in the hypothesized model, it is possible that parents serving lengthy sentences for non-violent crimes (e.g., drug offenses) do not exhibit psychopathic traits comparable to parents sentenced for more severe crimes. A more extensive investigation of the potential role of psychopathic traits in parents in the personality and behavioral characteristics of their offspring also may prove important in this area of research. Thus, the specific mechanisms involved in the familial transmission of antisocial behavior or personality features connected to adolescent delinqeuncy are in need of large-scale longitudinal studies. Future research also should consider the effects of maternal incarceration in adolescents with and without CU traits due to the rising rates of women incarcerated in the U.S. and women's frequent role as primary caregiver (Tasca et al., 2011; Turney & Wildeman, 2015).

It is also worth noting that a number of familial factors related to, and likely unrelated to, parental incarceration may have relevance for juvenile deliquency but were not assessed as part of this study. That is, some parenting/familial variables may have a more proximal influence on the expression of CU traits and related behavioral problems and may be worthy targets of intervention. Further, it may be that factors surrounding parental incarceration, not incarceration per se, are associated with delinquency, particularly in the subgroup of youth in our study with low CU traits who experienced parental incarceration. Indeed, an unstable home environment tied to parental incarceration (e.g., moving, financial strain) may be related to repeated delinquency among at-risk youth (Tasca et al., 2011). Such factors, as well as the timing of parental incarceration relative to youth age, deserve attention, particularly in delineating relative risk between youth with and without elevated levels of CU traits.

Future research should delve further into the experiences of children of incarcerated parents throughout development, independent of, and in conjunction with, the development of CU traits. To wit, 43% of the present sample of at-risk youth experienced or were experiencing a parental or caregiver incarceration. As policymakers continue to

shift from punitive to risk-reduction models of criminal and juvenile justice, the societal impact of parental absence due to incarceration should be deemed a public health concern. Protective factors in children of incarcerated parents also should be examined, particularly for youth without CU traits. For example, self-reported empathy has been shown to protect against aggression toward peers in youth with a history of parental incarceration (Dallaire & Zeman, 2013); thus, this connection should be explored in the context of delinquency and the presence/absence of CU traits.

The present study helps illustrate the likely multifaceted and complex set of risk factors involved in juvenile delinquency. Not surprisingly, contextual (e.g., family behavioral norms, parental incarceration, social modeling) and intraindividual risk factors (e.g., CU traits) each appear to contribute to risk for delinquency. What remains somewhat unclear is how these variables are related specifically. Research on these issues could provide some much needed insight into the complexity of juvenile delinquency, how delinquency might differ based on personality and/or familial factors, and how prevention or intervention efforts might be most suitable for particular adolescents with particular sets of risk factors.

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