Callous–Unemotional Traits Predict Self-Reported Offending in Adolescent Boys: The Mediating Role of Delinquent Peers and the Moderating Role of Parenting Practices

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Research has only recently begun to examine how callous–unemotional (CU) traits interact with contextual factors to predict delinquent behavior. The current study attempts to explain the well-established link between CU traits and offending by testing the potential mediating and moderating roles of 2 critical contextual factors: peer delinquency and the quality of the parent–adolescent relationship among a sample of 1,216 male juvenile offenders. Youth in the study were interviewed once every 6 months and in the current analyses, CU traits measured at baseline, parenting and delinquent peer association measured during the 6-month interview, and offending measured at the 1-year interview were utilized in path analysis. The findings suggested that the effect of CU traits was partially mediated by delinquent peer association. Additionally, it was found that when both parental warmth and supervision were high, this indirect effect through delinquent peer association was no longer significant. The findings highlight the importance of specific aspects of parenting in reducing delinquent peer influence, particularly among youth with high levels of CU traits.

Keywords: callous–unemotional traits, delinquency, moderated-mediation, parenting, peers

Callous–unemotional (CU) traits characterize youth who lack remorse and guilt, have shallow affect, and are unconcerned about the negative impact of their actions on themselves and others (Frick, Ray, Thornton, & Kahn, 2014). These traits have been consistently associated with severe, aggressive, and persistent patterns of offending and designate a group of antisocial youth who are difficult to treat using typical mental health interventions (Frick et al., 2014; Hawes, Price, & Dadds, 2014). Although a

considerable amount of research has demonstrated that CU traits predict antisocial outcomes, less research has focused on factors that might explain the process by which these traits lead to poor outcomes (i.e., mediators) or on factors that exacerbate or attenuate this association (i.e., moderators). Identifying the mediators and moderators of this risk is critical for advancing causal theories about serious juvenile offending and for improving treatment for this group of youth. We examined two variables, delinquent peer association and authoritative parenting, which could be important contextual factors influencing the relationship between CU traits and delinquent behavior.

Association With Delinquent Peers

One of the most robust predictors of delinquent behavior in adolescence is a youth's association with delinquent peers (Monahan, Steinberg, & Cauffman, 2009). In fact, research suggests that most adolescent crime is committed in groups of peers (Goldweber, Dmitrieva, Cauffman, Piquero, & Steinberg, 2011), which has led to a number of developmental theories to explain how delinquent peers are linked to adolescent offending. Most notably, social learning theories suggest that youth learn and adopt delinquent attitudes and behaviors through their association with other delinquent youth (Akers, 1998). Alternatively, some theories sug-

gest that similarly situated or like-minded youth select peers who are similar to them (Gottfredson & Hirschi, 1990). Although often viewed as competing explanations, it is likely that socialization and selection processes occur in a reciprocal fashion (Matsueda & Anderson, 1998). That is, antisocial youth may select other antisocial peers, and this peer group may in turn maintain and accelerate a youth's antisocial behavior.

There is evidence to suggest that youth with CU traits may be particularly susceptible to this process. Specifically, adolescents with elevated CU traits seek out deviant peers at a higher rate (Goldweber et al., 2011; Kerr, Van Zalk, & Stattin, 2012; Kimonis, Frick, & Barry, 2004; Pardini & Loeber, 2008; Van Zalk & Van Zalk, 2015) and are more likely to commit crimes in groups (Goldweber et al., 2011; Munoz, Kerr, & Besic, 2008; Thornton et al., 2015) than other antisocial adolescents. Further, youth with CU traits often have better interpersonal skills that can be used to manipulate others for their own purpose (Salekin, Worley, & Grimes, 2010). For example, Kerr et al. (2012) used peer network analysis in a community sample of adolescents and reported that adolescents with elevated CU traits had a strong influence on the antisocial behavior of their peers. Similarly, Thornton et al. (2015) reported that not only were adolescents with elevated CU traits more likely to commit crimes in groups, they were more likely to report being the leader and instigator (i.e., reporting that the crime was their idea) of the crime. In short, there is substantial evidence to suggest that the antisocial behavior of adolescents with elevated CU traits is highly related to their extensive deviant peer networks (Martens, 2002; Skeem, Scott, & Mulvey, 2014; Tatar, Cavanagh, & Cauffman, in press).

Parenting and Delinquent Behavior

Another contextual factor critical to theories of adolescent delinquent behavior is the quality of parenting that the adolescent experiences (Hoeve et al., 2012). Specifically, warm and structured parenting is characterized as the optimal parenting style for positive adolescent development (Lamborn, Mounts, Steinberg, & Dornbusch, 1991) and for specifically reducing an adolescent's risk for delinquent behavior (Hoeve et al., 2012; Steinberg, Blatt-Eisengart, & Cauffman, 2006). Further, research suggests that these two dimensions of parenting may be particularly important for explaining the link between CU traits and delinquent behavior.

Specifically, there is fairly consistent evidence that the influence of parenting on antisocial behavior may be different in children and adolescents with and without elevated CU traits (Waller, Gardner, & Hyde, 2013). For example, Pasalich, Dadds, Hawes, and Brennan (2011) reported that the influence of coercive parenting on conduct problems was weaker for youth with elevated levels of CU traits, whereas parental warmth was more strongly related to conduct problems for such youth. Waller et al. (2013) reviewed other studies showing similar differences in the effects of parenting for youth with and without elevated CU traits and concluded that warm parenting may be more important for youth with CU traits because it does not rely on responsiveness to punishment to socialize the child but fosters a positive parent–child relationship that enhances a child's ability to internalize prosocial values and promotes the child's understanding of others' emotions (see also Kochanska, Kim, Boldt, & Yoon, 2013). Further, parental structure, particularly a parent's ability to effectively

monitor and track an adolescent's whereabouts, also could be important for explaining the link between CU traits and delinquency (Laird, Criss, Pettit, Dodge, & Bates, 2008). Importantly, as youth move into adolescence the emphasis of parenting shifts from regulating behavior in the home to regulating peer group behavior, whereby parental monitoring may reduce the association with delinquent peers and subsequently reduce the influence of these peers on the child's behavior (Patterson & Dishion, 1985). Thus, if peer delinquency is a critical mechanism for explaining the serious antisocial behavior displayed by youth with elevated CU traits, then appropriate parental monitoring and supervision could be critical for addressing this process.

Finally, although both parental warmth and parental monitoring may be important for reducing peer delinquency, there is also strong evidence that the two together may be most critical. That is, the influence of parental monitoring on reducing the influence of delinquent peers may be enhanced, or even depend, on the level of parental warmth (Lamborn et al., 1991). Specifically, monitoring and other attempts at structure by parents who are not warm and who do not have a positive relationship with their adolescent, could be viewed as intrusive and lead to less disclosure of his or her whereabouts by the adolescent (Darling & Steinberg, 1993; Kerr & Stattin, 2000). In contrast, in the presence of parental warmth, parental monitoring attempts may be viewed as a sign of caring and concern by the adolescent. In support of this possibility, Mounts and Steinberg (1995) reported that peers were less influential on adolescents' substance use when parents showed authoritative parenting, characterized by both parental warmth and structure (see also, Kiesner, Poulin, & Dishion, 2010). Specific to delinquent behavior, Henry, Tolan, and Gorman-Smith (2001) reported that authoritative parenting reduced delinquency, and that this impact was mediated through its influence on delinquent peer association. Finally, within a community sample of 1,730 adolescents, parental attempts to monitor adolescent's behavior reduced affiliations with delinquent peers, but only if the adolescent did not report feeling "overcontrolled" by their parents (Tilton-Weaver, Burk, Kerr, & Stattin, 2013).

Current Study

Based on this background research, the current study attempted to advance knowledge on the well-established link between CU traits and offending by testing the potential mediating and moderating roles of two critical contextual factors: peer delinquency and the quality of the parent-adolescent relationship. Specifically, we tested whether the link between CU traits and self-reported offending would be at least partially mediated by the adolescent's level of association with delinquent peers. Further, we tested whether the mediating role of delinquent peers would be moderated by the presence of both parental warmth and parental monitoring. That is, we hypothesized that the indirect effects of CU traits on self-reported offending through delinquent peer association would not be significant at high levels of both warmth and monitoring. Specifically, we predicted that there would be a three-way interaction between CU traits, parental monitoring, and parental warmth in the prediction of peer delinquency. We hypothesized that the moderating effect of parental monitoring would depend on parental warmth (i.e., authoritative parenting). We tested these predictions in a large and ethnically diverse sample of

male adolescent offenders using a longitudinal design in which the primary predictor (CU traits) was assessed prior to the primary outcome of interest (self-reported offending) and the mediator (peer delinquency) and moderator (parenting) variables were assessed at an intermediate time point.

Method

Participants

The current sample utilized the first three waves (baseline, 6 months, and 12 months) of data from the Crossroads study, an investigation of the comparative effects of formal court processing versus diversion. The study includes 1,216 male adolescents who were drawn from the juvenile justice systems of Jefferson Parish, LA ($n = 151$); Orange County, CA ($n = 532$); and Philadelphia, PA ($n = 533$). To be eligible for the Crossroads Study, juveniles had to be first-time male offenders, English speakers between the ages of 13 to 17 ($M = 15.29$; $SD = 1.29$) at the time of arrest, and have an eligible offense. Eligible charges were midrange offenses, such as theft of goods, simple battery, and vandalism. Given the aim of the Crossroads to compare the effects of formal (i.e., petition filed) versus informal (i.e., diversion) processing on adolescents with charges of similar levels of severity, eligible charges were selected based on their relatively even probability of being formally or informally processed using official records from each jurisdiction over the four years prior to the initiation of the study. Sample size differed by site to reflect differences in the likely number of offenders in each region with eligible charges, based on these court records. Finally, participants were recruited to oversample diverted youth, with the expectation that some of these youth would be formally processed during the follow-up periods. This recruitment process led to the following distribution of formally processed and diverted youth across sites: CA: formal = 261, informal = 269; PA: formal = 198, informal = 335; LA: formal = 88; informal = 63.

Across all three sites, 72.32% of individuals eligible to participate enrolled in the study. At the baseline assessment, the sample was predominately Latino (46.1%) and Black (38.1%), with a much smaller portion identifying themselves as White Non-Latino (15.7%). Participants' average Wechsler Abbreviated Scale of Intelligence (WASI-II; Wechsler, 1999) Full-Scale IQ (FSIQ), as estimated by two subtests (Vocabulary and Matrix Reasoning), was 88.42 ($SD = 11.59$). Among the study participants, 87 reported being placed in secure detention at some point between baseline interviews and the 12-month follow-up period (CA = 40, PA = 42, LA = 5). Among those youth who were detained at some point between the baseline interview and the 12-month follow-up, the average length of time in detention was 5.28 months. Additionally, there were significant differences in length of time in detention across sites, $F(2, 83) = 9.87$, $p < .001$, $\eta^2 = .19$. Specifically, time in detention was higher for those at the PA site ($M = 6.95$ months; $SD = 3.66$) compared with the CA site ($M = 3.78$ months; $SD = 2.98$). Although the LA site showed the lowest average length of detention ($M = 3.6$ months; $SD = 3.13$), it did not differ significantly from the other two, most likely because of such a small number of youth placed in detention at this site.

Procedures

Institutional Review Board approval was obtained at each site before data collection began. Youth were referred to the study immediately after the initial processing decision (i.e., diversion vs. formal court processing) by court personnel who were responsible for making that decision which varied by site (e.g., district attorney, juvenile probation). Arrest reports and case files were then screened by study personnel to determine eligibility. Eligible youth were enrolled in the study after obtaining informed consent from legal guardians and assent from the youth. Both the youth and guardian were informed that participation in the study was entirely voluntary and that participation would in no way influence the youth's treatment by the juvenile court system. The youth and guardian were also informed that the research project had obtained a Privacy Certificate from the Department of Justice which protected information from being subpoenaed for use in legal proceedings. Participants were first interviewed within 6 weeks of a processing decision (i.e., either formal processing or diversion) and were then interviewed every 6 months over the course of three years. The current analysis includes the first three waves of data collection: baseline, 6-month, and 12-month time points.

Interviews were conducted using laptop computers to assist with administration as well as ease of data entry. The laptops were equipped with an interviewing program that included all of the items and measures for standardized administration. The interviews took place at a location convenient to the youth, such as their home or a local place in the community (e.g., library, coffee shop) or in a facility if the youth had been incarcerated. The participants were compensated for their time. Participants received $50 for the first baseline interview. For each successive interview, payment increased by $15 (i.e., $65 for the 6-month interview and $80 for the 12-month interview). Retention at the 6-month ($n = 1,161$; 95.48% retention) and 12-month ($n = 1,141$; 93.83% retention) follow-ups was high.

Measures

Predictor (baseline): Callous–unemotional traits. The Inventory of Callous-Unemotional traits (ICU; Kimonis et al., 2008) is a 24-item self-report instrument used to assess CU traits in children and adolescents (e.g., *I feel bad or guilty when I do something wrong* and *I try not to hurt others' feelings*). Participants rated items on a 4-point Likert scale from 0 (*not at all true*) to 3 (*definitely true*). The use of the total score on the ICU has been supported in factor analyses conducted with both detained (Kimonis et al., 2008) and community (Essau, Sasagawa, & Frick, 2006) samples of adolescents. That is, although factor analyses suggest that the items consistently form three subfactors (Callousness, Unemotional, and Uncaring; e.g., Kimonis et al., 2008), adequate model fit is only obtained by specifying an overarching CU dimension including all items. Further, the construct validity of three subfactors has been called into question by item–response analyses, suggesting that they may reflect method factors attributable to the direction of item wording (Ray, Frick, Thornton, Steinberg, & Cauffman, 2016). Finally, the total score on the ICU correlates positively with antisocial behavior and negatively with pro-social behavior in samples of both community and detained adolescents (Essau et al., 2006; Kimonis et al., 2008). In the current study mean item scores for all items were utilized, thus reflecting the

original scale metric (0–3). Levels of CU traits based on the mean item score are similar to those in prior studies using the ICU (Essau et al., 2006; Kimonis et al., 2008). In the current sample, the ICU total score showed acceptable internal reliability ($\alpha = .76$) at baseline.

Mediator variable (6-month): Peer delinquency. The 13 items comprised by the Peer Delinquency Scale (PDS; Thornberry et al., 1994) assess peer antisocial behaviors. The items ask about 13 different delinquent acts (e.g., "Carried a knife?", "Hit or threatened to hit someone?"), and participants responded with how many of their friends have done the specific behavior, ranging from 1 (*none of them*) to 5 (*all of them*). The scores are summed, with higher scores indicating a higher number of friends who are perceived to engage in the range of behaviors. The PDS was correlated with both neighborhood disorder and self-reported offending in a sample of serious male juvenile offenders (Chung & Steinberg, 2006). The PDS demonstrated excellent internal reliability at baseline ($\alpha = .90$) and at the 6-month assessment ($\alpha = .91$).

Moderator variables (6-month).

Parental monitoring. Parental monitoring is a subscale of four items taken from the Parental Monitoring Inventory (PMI; Steinberg, Lamborn, Dornbusch, & Darling, 1992). These four items were asked about the adolescent's primary caretaker to assess parental attempts to monitoring the youth's behavior (e.g., "How often do you have a set time to be home on weekend nights?"). Primary caretaker varied across youth; however, they were predominantly biological mother ($n = 839$; 70.4%), biological father ($n = 166$; 13.9%), or biological grandmother ($n = 62$; 5.2%). Items were answered on a 4-point Likert scale ranging from 1 (*never*) to 4 (*always*) and were summed to derive a total score, in which higher scores indicate higher levels of parental monitoring. The parental monitoring inventory has shown to be positively associated with academic success (Steinberg et al., 1992) and negatively related to violent offending and substance use among juvenile offenders (Steinberg et al., 2006). In the current study, mean scores for parental monitoring were used. The parental monitoring subscale showed good internal reliability ($\alpha = .67$) at the 6-month assessment.

Maternal warmth. Maternal warmth was taken from the Quality of Parental Relationships Inventory (Conger, Ge, Elder, Lorenz, & Simons, 1994), which was adapted for this study to assess the affective tone of each youth's relationship with his parents. The inventory consists of 21 items, of which nine tap maternal warmth (e.g., "How often does your mother let you know she really cares about you?"). Participants respond on a 4-point Likert scale ranging from 1 (*always*) to 4 (*never*). The nine items comprised by the maternal warmth subscale were summed to derive a total maternal warmth score, where higher scores indicate a more supportive and nurturing relationship. The maternal warmth scale has been found to be negatively associated with depression and conduct disorder in samples of adolescents (Ge, Best, Conger, & Simons, 1996). Mean scores on the maternal warmth scale were used in the current study and showed good internal consistency ($\alpha = .90$) at the 6-month assessment.

Outcome (12-month): Offending. The self-report of offending scale (SRO; Huizinga, Esbensen, & Weiher, 1991) was used to assess offending behavior at baseline and at the 12-month time-point. The SRO is comprised of dichotomous items (0 = no and 1 = yes) asking participants if they have ever engaged in 24 different types of crime (e.g., property damage, theft, carrying a gun) at baseline and if they had engaged in these behavior in the prior 6th months at the 12-month follow-up. Thus, the outcome variable assessed behaviors that occurred after the report of the potential mediator and moderator variables. The scores for each of the items are summed to create an overall measure of variety of offending, where higher scores are indicative of more different types of offending. The SRO has demonstrated significant correlations with official reports of offending (Thornberry & Krohn, 2000). The 12-month SRO violated assumptions of normality based on the estimates of skewness (i.e., 3.70) and kurtosis (i.e., 10.90). To address this issue, the SRO outcome variable was log transformed (after a constant of 1 was added to SRO scores), which corrected for both skewness (i.e., 1.23) and kurtosis (i.e., 0.74). After being log transformed the SRO at 12 months had a mean of .21 ($SD = .29$) and ranged from .00 to 1.18. The SRO exhibited good internal reliability in the current sample at both baseline and the 12-month time points (αs = .82).

Data Analyses

Analyses were carried out in IBM SPSS statistics version 21 (2012) and Mplus version 7.2 (Muthen & Muthen, 2014). Correlations among all study variables are presented in Table 1. To test the main study hypotheses of mediation and moderated-mediation, a series of path analysis models were conducted using syntax for estimating moderated-mediation models in Mplus (Stride, Gardner, Catley, & Thomas, 2015) that are based on Hayes's (2012) Process models. First, to examine the role of peer delinquency in mediating the association between CU traits and offending, a basic mediation model using path analysis was estimated. For these analyses, the effects of each outcome were analyzed controlling for baseline levels. That is, the effects of baseline CU traits on 6-month peer delinquency controlled for baseline peer delinquency and the direct and indirect effects of CU traits on 12-month delinquency controlled for baseline delinquency. Second, to evaluate if any significant indirect effects were conditional on parenting practices (i.e., maternal warmth and parental monitoring) a series of moderated-mediation models were conducted in the Mplus program using path analysis.

Model fit was assessed based on Chi-Square test of model fit, Root Mean Square Error of Approximation (RMSEA), Comparative Fit Index (CFI), and the Standardized Root Mean Square Residual (SRMR). In determining model fit we followed recommended guidelines for each model fit index (see Kline, 2005): nonsignificant Chi-Square value, RMSEA < .05; CFI > .90, and SRMR < .10. Figure 1 presents the conceptual moderated-mediation model. Specifically, using path analysis for examining moderated-mediation, we examined if parental monitoring moderated the path between CU traits and peer delinquency, and if this moderating effect was contingent on maternal warmth (i.e., a 3-way interaction: CU traits × Parental Monitoring × Maternal Warmth). For both the basic mediation model and the moderated mediation model demographic characteristics (i.e., age and ethnicity), IQ (i.e., WASI-II), and baseline self-reported offending were accounted for and 95% bias corrected bootstrap confidence intervals were estimated based on 10,000 random samples. Additionally, variables used in the interactions were mean-centered prior to

Table 1
Zero-Order Correlations, Means, Standard Deviations, and Ranges Among Study Variables

Variable	2	3	4	5	6	7	8	9	10	11	12	Mean/%	SD	Range
Covariates														
1. Age	.06*	.09**	−.09**	.03	.21***	.15***	−.02	.12***	−.09**	−.15***	.01	15.29	1.29	13–17
2. IQ	—	.27***	−.14***	−.06*	.09**	−.01	−.07*	.02	−.18***	.00	.01	88.42	11.59	55–128
3. White		—	—	—	.07*	−.01	−.05	.10**	−.05	.02	.07*	15.7%	—	—
4. Black			—	—	−.11***	−.08**	−.08**	−.05	.19***	.07*	−.08**	38.1%	—	—
5. Latino				—	.06*	.02	.11***	−.02	−.14***	−.08**	.03	46.1%	—	—
6. SRO baseline					—	.69***	.29***	.57***	−.19***	−.23***	.44***	3.42	3.08	0–19
7. Peer delinquency baseline						—	.35***	.63***	−.12***	−.24***	.39***	1.74	.67	1–5
Dispositional characteristics														
8. CU traits							—	.33***	−.25***	−.21***	.29***	1.09	.34	0–2.29
Mediator														
9. Peer delinquency								—	−.17***	−.27***	.50***	1.66	.68	1–4.92
Moderators														
10. Maternal warmth									—	.31***	−.15***	3.13	.69	1–4
11. Parental monitoring										—	−.16***	3.01	.67	1–4
Outcome														
12. SRO											—	1.17	2.20	0–14

Note. SRO = Self-reported offending; CU = callous–unemotional. Covariates and dispositional characteristics measured at baseline; Mediator and moderator measured at 6-month time point; Outcome measured at 1-year time point.
* $p < .05$. ** $p < .01$. *** $p < .001$.

moderated-mediation analyses. Significant indirect effects were probed by examining the indirect effects at various levels of the moderators (i.e., Mean and ± 1 SD) and at different combinations of the level of the moderators (e.g., Low monitoring/High warmth, High monitoring/Low warmth).

To account for differences across study sites, a multigroup analysis was conducted using site as the grouping variable to determine whether there were differences in the conditional indirect effect that may be attributable to variations in juvenile court processing across the different sites. Additionally, because of the potential for detainment to affect study variables and their associations with each other, all analyses were conducted both including and removing youth who had been detained at any point during the study period. However, no site differences in the conditional indirect effects emerged in multigroup analysis and the analyses were similar including and excluding detained youth. Thus, the results reported below are for the full sample merged across site. Although the majority of variables had complete data or were missing very few values, because of attrition and nonresponse there were some measures for which a considerable amount of data were missing. Specifically, 150 participants were missing data on

parental monitoring, 89 on maternal warmth, and 53 on peer delinquency. To handle missing data, the nature of the missingness was first assessed by comparing those who were missing data to those who had valid responses on study variables. No significant differences were found between those missing data and those not missing data on demographic characteristics, CU traits, and self-reported offending. Based on these findings, which support the possibility that the data were missing at random (MAR), full information maximum likelihood (FIML) estimation was used to handle missing data in the mediation and moderated-mediation models.

Results

Bivariate Associations Between CU Traits, Peer Delinquency, Parenting, and Self-Reported Offending

Along with the distribution or frequency for all study variables, Table 1 also presents the zero-order correlations among the main study variables. All study variables demonstrated correlations in
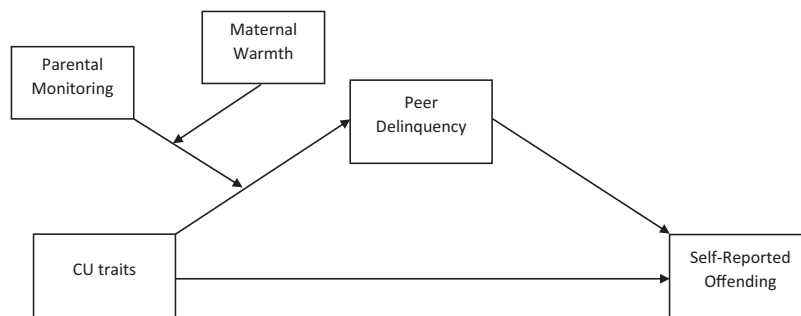

Figure 1. CU = callous–unemotional. Path diagram for the conditional effect of parenting on the indirect effect of CU traits on self-reported offending.

the expected directions. Specifically, these analyses suggested that adolescents with higher levels of CU traits at baseline tended to have higher levels of self-reported offending measured at baseline and at 12 months and were more likely to have delinquent peers at baseline and 6 months. In contrast, adolescents with higher levels of CU traits at baseline had lower levels of parental warmth and monitoring at 6 months. Additionally, adolescents who reported more self-reported offending at baseline were more likely to have delinquent peers at both baseline and 6 months and more self-reported offending at 12 months, but had lower levels of maternal warmth and parental monitoring at 6 months. Not surprisingly, baseline delinquent peer association was positively correlated with delinquent peer association at 6 months. Finally, youth with higher levels of delinquent peer association at 6 months had more self-reported offending at 12 months whereas youth with higher levels of parental warmth and monitoring had lower levels of self-reported offending at 12 months.

Does Delinquent Peer Association Mediate the Relationship Between CU Traits and Offending?

Figure 2 presents the basic mediation model, along with the path coefficients for the effect of baseline CU traits on self-reported offending at 12 months mediated by peer delinquency. Based on model fit criteria, the model fit the data well ($\chi^2 = 3.16$, $p = .37$; RMSEA = .007; 90% CI [0.00, .049]; CFI = 1.00; SRMR = 0.01). It should be noted that age, race/ethnicity, and IQ, as well as prior self-reported offending and delinquent peer association were accounted for in this model. Beyond the significant coefficients shown in Figure 2, the only other significant predictors of peer delinquency were being White ($B = .127$, $p < .01$), prior self-reported offending ($B = .058$, $p < .001$), and prior delinquent peer association ($B = .431$, $p < .001$). Also, in addition to CU traits and delinquent peers at 6 months, age ($B = -.021$, $p < .001$) and baseline self-reported offending ($B = .021$, $p < .001$) were predictors of self-reported offending at 12 months, with younger offenders and those with higher self-reported offending at baseline reporting higher levels of self-reported offending at 12 months. As shown in Figure 2, the path model indicates that peer delinquency mediated the association between CU traits and self-reported offending (Total indirect effect = .034, $p < .001$). However, the

magnitude of the indirect effect is modest based on the proportion of total effect that is mediated ($P_M = .263$; Preacher & Kelley, 2011) and the direct effect of CU traits on self-reported offending remained significant ($B = .095$, $p < .01$), indicating that the effect of CU traits on self-reported offending was only partially mediated by peer delinquency.

Does the Mediating Role of Peer Delinquency on the CU-Offending Relationship Vary at Different Levels of Parental Warmth and Monitoring?

Table 2 presents the results of the analysis evaluating if the indirect effects of CU traits (baseline) on self-reported offending (12-month) through peer delinquency (6-month) were conditioned by maternal warmth and parental monitoring (6-month) while controlling for demographic characteristics and prior self-reported offending (baseline). That is, we examined whether parental monitoring moderated the effect of CU traits on peer delinquency (2-way interaction) and whether this interaction was contingent on maternal warmth (3-way interaction). Based on model fit criteria, the model fit the data well ($\chi^2 = 3.57$, $p = .73$; RMSEA = .000; 90% CI [0.00, .027]; CFI = 1.00; SRMR = 0.004). As shown in Table 2, none of the two way interactions were significant: CU $\times$ Monitoring ($B = .011$, $p = .901$), CU $\times$ Warmth ($B = -.059$, $p = .462$), and Monitoring $\times$ Warmth ($B = -.034$, $p = .425$). However, the 3-way interaction among CU traits, parental monitoring, and warmth was significant ($B = -.237$, $p < .05$). This 3-way interaction is plotted in Figure 3. As shown in the figure, the interaction between CU traits and parental monitoring on peer delinquency was only significant at high levels of maternal warmth. Likewise, CU traits continued to exert a positive effect on peer delinquency when monitoring was low and warmth was high. In other words, as predicted, monitoring only attenuated the positive association between CU traits and delinquent peer association when maternal warmth was high.

Importantly, this interaction suggests that it is possible that the indirect effect of CU traits on self-reported offending through peers may also be conditioned by maternal warmth and parental monitoring (see Figure 1). The conditional indirect effects of CU traits on self-reported offending through delinquent peers at low (-1 SD), medium (*mean*), and high ($+1$ SD) levels of parental

Total Effect: **.11 (.13)**
Indirect effects: **.03 (.03)**

SRO: R^2 = .31

Peer Delinquency: R^2 = .44

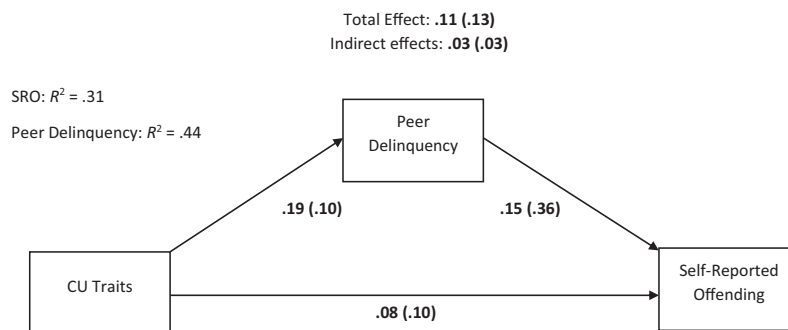**.19 (.10)**   **.15 (.36)**

.08 (.10)

Figure 2. CU = callous–unemotional. Mediation model for the indirect effects of CU traits on self-reported offending through peer delinquency. Bolded coefficients significant at $p < .001$. Unstandardized coefficients outside of parentheses and standardized in parentheses. All models control for baseline self-reported offending, peer delinquency, ethnicity, age, and IQ.

Table 2
Indirect Effects of CU Traits on Self-Reported Offending Through Peer Delinquency Conditional on Maternal Warmth and Parental Monitoring

| Predictor	B (β)	SE	95% CI
Peer delinquency			
Age	−.007 (−.014)	.012	−.034–.014
IQ	.000 (−.005)	.001	−.003–.002
Race (Latino = comparison)			
Black	.069 (.049)*	.034	.013–.145
White	.136 (.072)**	.045	.020–.195
Baseline self-reported offending	.054 (.222)***	.009	.101–.134
Baseline peer delinquency	.412 (.407)***	.035	
CU traits	.194 (.097)***	.047	.089–.284
Parental monitoring	−.109 (−.117)	.030	−.278–.067
Maternal warmth	−.039 (−.040)	.027	−.174–.148
CU traits × Monitoring	.011 (.004)	.089	−.151–.184
CU traits × Warmth	−.059 (−.021)	.080	−.189–.130
Monitoring × Warmth	−.034 (−.027)	.043	−.044–.457
CU × Monitoring × Warmth	−.193 (−.058)*	.097	−.450–−.052
R^2 = .453			
SRO			
Age	−.022 (−.096)***	.006	−.032–−.009
IQ	.000 (.005)	.001	−.002–.001
Race (Latino = comparison)			
Black	−.023 (−.038)	.014	−.050–.006
White	.009 (.011)	.024	−.031–.050
Baseline self-reported offending	.021 (.209)***	.004	.013–.030
Baseline peer delinquency	.003 (.008)	.023	−.043–.046
CU traits	.078 (.093)**	.026	.029–.130
6-month peer delinquency	.152 (.359)***	.019	.116–.189
R^2 = .307			

Note. CU = callous–unemotional. Confidence intervals for conditional indirect effects are bias corrected based on 10,000 bootstrap samples.
* $p < .05$. ** $p < .01$. *** $p < .001$.

monitoring and maternal warmth are presented in Table 3. As shown in the table, the indirect effect was significant at almost all combinations of the different levels of warmth and monitoring. However, as predicted, it was only when warmth and monitoring were both high that the indirect effect of CU traits on self-reported offending through peers became nonsignificant (Indirect Effect = .010, $p = .458$). The indirect effect of CU traits on self-reported

offending through peers was also not significant at low levels of both monitoring and warmth (indirect effect = .020, $p = .202$).

Discussion

The current results advance research on the well-established link between CU traits and offending in adolescents in several ways (Frick et al., 2014). First, as in previous studies, CU traits were associated with having more delinquent peers in this racially/ethnically diverse sample of first-time male adolescent offenders
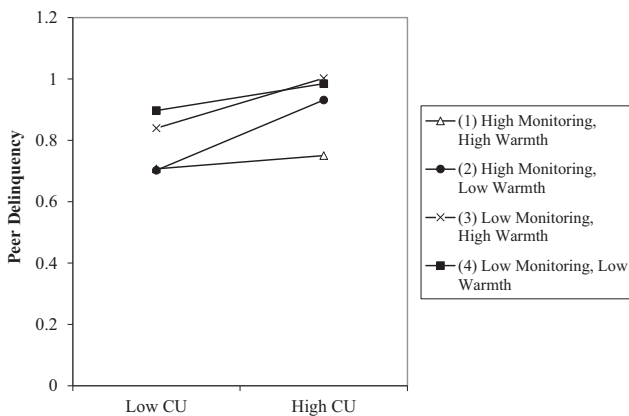
Figure 3. CU = callous–unemotional. Graph of the 3-way interaction between CU traits, parental monitoring, and maternal warmth at low (−1 *SD*) and high (+1 *SD*) levels of maternal warmth and monitoring.

Table 3
Conditional Indirect Effect at Low (−1 SD), Medium (Mean), and High (+1 SD) Levels of Maternal Warmth and Monitoring

Parental monitoring/Maternal warmth	Indirect effect	SE	95% CI
Low monitoring/Low warmth	.020	.015	−.010–.050
Medium monitoring/Low warmth	.036**	.012	.013–.056
High monitoring/Low warmth	.051*	.020	.015–.097
Low monitoring/Medium warmth	.028*	.011	−.004–.047
Medium monitoring/Medium warmth	.029***	.008	.017–.046
High monitoring/Medium warmth	.031*	.013	.010–.061
Low monitoring/High warmth	.037*	.032	−.002–.070
Medium monitoring/High warmth	.023*	.011	.003–.043
High monitoring/High warmth	.010	.013	−.014–.036

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

(Goldweber et al., 2011; Kerr et al., 2012; Kimonis et al., 2004; Pardini & Loeber, 2008; Van Zalk & Van Zalk, 2015). This is important because past work has suggested that adolescents elevated on CU traits may be highly influential to the level of antisocial behavior displayed by their peers (Kerr et al., 2012; Thornton et al., 2015). However, the current study suggests that the opposite is also true. That is, delinquent peer association also partially accounted for the predictive relationship between CU traits and offending. Specifically, about 26% of the total effects of CU traits on self-reported offending 12 months later, after controlling for initial levels of offending and delinquent peer association, was accounted for by peer delinquency at 6 months.

Although the current results support previous work suggesting that the effects of CU traits on an adolescent's antisocial behavior needs to be embedded within the peer network, it is also important to note that the direct effect of CU traits on later offending remained significant even after accounting for the mediating role of peer delinquency and the proportion of total effect that was mediated by peers was moderate in size (i.e., $P_M = .263$ or 26% of the total effect). Thus, future research should also consider other factors that could help to explain this association, such as the failure of adolescents with elevated CU traits to respond to punishment cues in many situations (Frick, Cornell, Bodin, Dane, Barry, & Loney, 2003), their tendency to view aggression as an acceptable means for obtaining goals (Pardini, Lochman, & Frick, 2003), or their lack of responsivity to distress cues in others (Kimonis, Frick, Fazekas, & Loney, 2006). However, our results suggest that factors that may reduce the influence of deviant peers could be important for also reducing the risk for delinquency in adolescents with elevated CU traits, a group that heretofore has proven to be resistant to many interventions that target a reduction in antisocial behaviors (Frick et al., 2014).

Our moderation tests provide some clues for potential targets of interventions. Specifically, the indirect effects of CU traits on later offending through peer delinquency was not significant when adolescents came from homes in which the parent–child relationship was characterized by a high degree of warmth and in which parents engaged in behaviors to monitor and track their adolescents' behavior. These results support past research identifying the importance of *both* parental warmth and parental monitoring for reducing an adolescent's association with deviant peers (Henry et al., 2001). That is, neither of these parenting dimensions alone led to this moderation but both were required. These results are consistent with past research suggesting that much of parental knowledge about an adolescent's behavior and peers comes from the youth's willingness to disclose such information, which is dependent on the quality of the parent–child relationship (Kerr & Stattin, 2000). The findings also support research suggesting that parental monitoring in the absence of warmth may be viewed by the adolescent as intrusive and aversive and has detrimental effects on the adolescent's adjustment (Darling & Steinberg, 1993; Tilton-Weaver et al., 2013).

To highlight the importance of both warmth and monitoring, high levels of parental warmth without high levels of monitoring and supervision enhanced the effect of deviant peers on the youth's own delinquent behavior. In fact, this was the pattern of parenting in which the effect of CU traits on peer association was strongest (see Figure 3). It may be that youth perceive parents who display warmth without structure as being permissive and that youth with

CU traits may take advantage of this parenting style. These findings should also be considered in light of the current study sample. Given that all youth in the study were first-time offenders, the findings provide insight into the salience of individual (i.e., CU traits) and social (i.e., parenting and peers) factors at what could be a crucial point in a youth's offending trajectory. That is, contact with the juvenile justice system may alienate youth and lead to delinquent peer association as they try to "fit in" (Bernburg, Krohn, & Rivera, 2006), particularly for those who have elevated levels of CU traits. However, parenting involving both warmth and structure could have the effect of reducing this negative stigma and thereby protecting the negative outcomes associated with delinquent peer association.

The current study has several strengths that bolster the confidence in these findings. Most importantly, we tested our mediational and moderational hypotheses in a relatively large and racially/ethnically diverse sample using longitudinal methodology. Further, the mean scores on the ICU in the current sample ($M = 26.28$, $SD = 8.08$, range = 0–55) were comparable with those reported in past studies involving justice-involved youth: $M = 26.07$, $SD = 8.25$ (Kimonis et al., 2008), $M = 29.45$, $SD = 8.99$ (Feilhauer, Cima, & Arntz, 2012), and $M = 24.88$, $SD = 9.45$, range = 1 – 46 (Docherty, Boxer, Huesmann, O'Brien, & Bushman, 2016). Additionally, the mean scores in the current sample were just below cutoff of 28 that was found to be optimal for differentiating detained and nondetained adolescents (Docherty et al., 2016). Thus, despite being first-time offenders, the level of CU traits displayed by the sample were similar to those found in other justice-involved samples of adolescents.

However, there were also a number of limitations in the study methods that need to be considered when interpreting the results. First, all measures relied on adolescent self-report and thus associations among variables may have been inflated due to shared method variance. Also, the validity of several of the key study constructs would have been enhanced by using multiple methods, such as including parent report of parenting behaviors and having peer reports of delinquency. Additionally, the study relied on self-report of offending that may capture offending behavior that does not come to the attention of the juvenile justice system or be observed by others (Thornberry & Krohn, 2000). Further, Krueger et al. (1994) found a considerable degree of convergence between the SRO scale and official records of delinquency including police contacts ($r = .42$) and convictions ($r = .36$). Nonetheless, this method relies on the adolescent's willingness to report on his or her offending behavior and future research should examine these associations using a multimethod, multiinformant method. Second, the study consisted only of boys who were first-time offenders with offenses that were of moderate severity. As a result, our findings need to be replicated with girls and with both community samples and samples of more serious offenders to determine their generalizability. Third, although our longitudinal methodology is a strength of the study, the follow-up period was relatively short (12 months), and it would be important to further test these effects for predicting delinquency over longer periods of times. Fourth, it is also important to point out that many of the coefficients, particularly those regarding the mediation and moderation, were small in magnitude suggesting that many other factors other than those included in the current study could be important for explaining adolescent delinquent behavior. Finally, the current study did not

test for bidirectional relationships between CU traits and delinquent peer association occurs over time. It is possible that CU traits not only make a child more likely to seek out deviant peers but that deviant peers and the antisocial behavior that result from this association could increase a child's level of callousness toward others. Thus, future research should test such bidirectional models.

Within the context of these interpretations, our results add to a growing body of research suggesting that CU traits are important predictors of antisocial outcomes in adolescence. However, they also support the need for considering several important contextual factors for advancing our understanding of this association. Our results suggest that the peer groups of adolescents with elevated levels of CU traits could play an important role in this link, which is not surprising given that adolescent offending is often committed in groups with other peers (Goldweber et al., 2011). Importantly, past research has suggested that not only do CU traits predict greater associations with deviant peers but that adolescents with CU traits are also highly influential in encouraging antisocial behavior in their peers (Kerr et al., 2012; Thornton et al., 2015). Thus, reducing the level of association with delinquent peers could have a great impact, not only in reducing the antisocial behavior of the adolescent with elevated CU traits, but could also help to reduce the antisocial behavior of his or her peers. Our findings further suggest that certain parenting factors, especially the combination of parental warmth and parental monitoring, could be critical factors in this important endeavor.

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