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Callous–Unemotional Traits and Delinquent Peer Affiliation

Eva R. Kimonis and Paul J. Frick
University of New Orleans

Christopher T. Barry
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Association with a deviant peer group is a robust correlate of juvenile antisocial behavior. The current study focused on whether this association differed for antisocial youth with and without callous–unemotional (CU) traits and whether potential mediators of this association differed for the 2 groups. Deviant peer group association was examined in a community sample (*N* = 98) of high-risk youth. The sample was assessed at 4 yearly intervals. Across all assessment points, children with conduct problems and CU traits showed the highest level of affiliation with deviant peers. At the first 2 assessment points, this effect was largely mediated by dysfunctional parenting and problems in the child's social relationships. In contrast, the mediational role of these variables was much weaker at the last 2 assessment points.

Research has consistently indicated that adolescents are significantly more likely to engage in antisocial behavior within delinquent peer groups (Fergusson, Swain, Horwood, 2002; Henry, Tolan, & Gorman-Smith, 2001; Keenan, Loeber, Zhang, Stouthamer-Loeber, & van Kammen, 1995; Lahey, Gordon, Loeber, Stouthamer-Loeber, & Farrington, 1999). In addition, deviant peer affiliation has proven to be a strong predictor of later delinquency (Patterson, Capaldi, & Bank, 1991) and other negative outcomes, such as substance abuse (Dishion, Capaldi, Spracklen, & Li, 1995; Fergusson et al., 2002; Thornberry, 1998). As a result, it is essential to understand what factors contribute to a child's affiliation with a deviant peer group for the prevention of juvenile crime and other negative psychosocial outcomes.

The current study focuses on two issues that could help in understanding the processes involved in deviant peer group affiliation. First, there is an emerging consensus that antisocial and aggressive behavior can result from a number of different developmental pathways, each involving somewhat distinct causal processes (Frick, 1998; Moffitt, 1993; Patterson, Reid, & Dishion, 1992; Richters, 1997). A critical question that has not been adequately addressed is whether certain pathways are more strongly associated with deviant peer group affiliation than others. Second, although there has been some research on potential mediators of the link between conduct problems and a child's affiliation with deviant peers, the results of this research have been somewhat mixed (Dishion, Patterson, Stoolmiller, & Skinner, 1991; Simons, Whitbeck, Conger, & Conger, 1991; Vitaro, Brengden, & Tremblay, 2000). The inconsistency in findings could be due to the fact that children who develop antisocial behavior along different causal pathways could be equally likely to associate with deviant peers but do so for different reasons. For example, Moffitt and colleagues (Moffitt, Caspi, Dickson, Silva, & Stanton, 1996) have reported that youth with a childhood onset to their antisocial behavior and youth with an adolescent onset are equally likely to associate with a deviant peer group; however, there may be different processes involved in the deviant peer group affiliation for these two groups (Moffitt, 1993; Moffitt & Caspi, 2001).

One potentially important pathway to severe conduct problems involves the presence of a callous–unemotional (CU) interpersonal style (see Frick, 1998; Frick, Barry, & Bodin, 2000, for reviews). Specifically, the presence of CU traits (e.g., lack of guilt, lack of empathy) designates a subgroup of antisocial youth with more severe and aggressive behavior in forensic (Kruh, Frick, & Clements, in press), mental health (Christian, Frick, Hill, Tyler, & Frazer, 1997), and community (Frick, Cornell, Barry, Bodin, & Dane, 2003) samples. Further, children with conduct problems who also show CU traits show a number of distinct characteristics, such as a preference for novel, exciting, and dangerous activities (Frick, Cornell, Bodin, et al., 2003; Frick, Lilienfeld, Ellis, Loney, & Silverthorn, 1999); decreased sensitivity to cues of punishment when a reward-oriented response set is primed (Barry et al., 2000; Fisher & Blair, 1998; Frick, Cornell, Bodin, et al., 2003); and less reactivity to threatening and emotionally distressing stimuli (Blair, 1999; Loney, Frick, Clements, Ellis, & Kerlin, 2003).

Unfortunately, no study to date has tested whether antisocial youth with and without CU traits also differ in their association with deviant peers. There are theoretical reasons for predicting both more and less involvement with deviant peers for children with CU traits. On the one hand, children with CU traits show characteristics that are very similar to a subgroup of antisocial youth who have been labeled as *undersocialized aggressive* in past research (American Psychiatric Association, 1980; Hewitt & Jenkins, 1946; Quay, 1993). This group has often been defined as being more likely to commit antisocial acts alone and has been contrasted with more "socialized delinquency," in which aggression and antisocial behavior is displayed "in the context of peer group loyalties" (Quay, 1993, p. 166). On the other hand, delinquent acts that are committed in groups may require more organization and planning because they involve the collaboration of

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multiple individuals. Children with CU traits have proven to be more likely to show planned and premeditated aggression and antisocial behavior (Frick, Cornell, Bodin, et al., 2003; Kruh et al., in press; Pardini, Lochman & Frick, 2003).

Further, even if antisocial youth with and without CU traits do not differ in their peer group affiliation, it is still possible that they associate with deviant peers for different reasons. For example, several studies have suggested that dysfunctional parenting practices in general (Simons et al., 1991; Vitaro et al., 2000) or poor parental monitoring and supervision specifically (Dishion et al., 1995) could mediate the relation between antisocial behavior in children and their deviant peer group affiliation. Specifically, appropriate parental monitoring and supervision, and the related construct of parental involvement in the child's activities, could reduce the likelihood of deviant peer association by enabling parents to have more control over the degree and type of peer associations experienced by the child. However, given that problematic parenting practices have been more strongly related to conduct problems in children without CU traits (Wootton, Frick, Shelton, & Silverthorn, 1997), it is possible that these parenting practices may play more of a mediating role in the deviant peer affiliation of children without these traits.

Another potential mediating factor is the child's social adjustment. There is evidence to suggest that children with conduct problems often lack appropriate social skills (Loeber & Farrington, 2001) and tend to be disliked and rejected by conventional peers (Patterson et al., 1991). This social deficiency could make them more likely to associate with other deviant peers who support and maintain their antisocial behavior (Coie, Terry, Zakriski, & Lochman, 1995; Dishion et al., 1991; Laird, Jordan, Dodge, Pettit, & Bates, 2001; Vitaro et al., 2000). Unfortunately, there has not been research directly comparing the social skills and social status of children with conduct problems who do or do not exhibit CU traits. However, children with conduct problems without CU traits show problems in emotional dysregulation (Frick, Cornell, Bodin, et al., 2003; Loney et al., 2003; Pardini et al., 2003). For example, adolescents in a diversion program for juvenile offenders who had conduct problems but who did not show CU traits showed stronger reactivity to words with negative emotional content than did control offenders (Loney et al., 2003). Further, there is an association between emotional dysregulation and peer rejection (Dodge & Pettit, 2003). As a result, it is possible that problems in social adjustment may also be more related to deviant peer affiliation in children without CU traits.

Emotional dysregulation is related to a broader construct of impulsivity and self-control (Barkley, 1997; Nigg, 2000). Some theories of deviant behavior emphasize the importance of self-control for the development of prosocial values, including a child's willingness to engage in prosocial activities and associate with prosocial peers (Gottfredson & Hirschi, 1990). However, impulsivity and self-control are very broad constructs, and antisocial youth with and without CU traits both show problems in self-control, albeit somewhat different aspects of these constructs (Frick, Cornell, Barry, et al., 2003). Therefore, impulsivity could mediate the association between conduct problems and deviant peer affiliation for children with and without CU traits.

A related concept that is integral to social control theories of delinquency is the child's involvement in prosocial activities (Gardner & Shoemaker, 1989). In fact, self-control is sometimes

viewed as having its primary influence on a child's adjustment through its role in preventing the child from being successfully involved in such activities (Wiatrowski & Anderson, 1987). Further, the more time a child spends in activities with prosocial peers, the less time he or she potentially has in unsupervised activities with potentially deviant peers (Wiatrowski & Anderson, 1987). Therefore, the amount of time a child spends in prosocial activities could also be a potential mediator of the link between antisocial behavior and deviant peer affiliation, and this could be particularly important for children who are high on CU traits. That is, one aspect of this specific interpersonal style is the lack of motivation for engaging in prosocial activities that do not directly benefit the child (Frick, Barry, & Bodin, 2000; Pardini et al., 2003).

On the basis of this research, the current study attempts to address two specific questions. The first questions focuses on whether children with conduct problems with and without CU traits exhibit the same level of association with delinquent peers. The second question focuses on whether the same variables mediate the relation between antisocial behavior and deviant peer group affiliation in the two groups. Specifically, the study tests whether dysfunctional parenting, poor social adjustment, high levels of impulsivity, and lack of involvement in prosocial activities could explain the relation between conduct problems and deviant peer association and whether any mediational effects were specific to a subgroup of antisocial youth.

Method

Participants

There were several goals that guided the recruitment of a sample to address these research questions. The first goal was to obtain a community sample of youth with conduct problems to avoid potential referral biases that might be present in clinic-referred or forensic samples. Second, when we were obtaining a nonreferred sample, it was also important to ensure that enough children with severe conduct problems were recruited. Third, given that the primary study questions focused on differences between youth with high and low levels of CU traits, it was important to ensure that sufficient numbers of conduct problem youth in these two groups were recruited. Fourth, it was important to ensure that the oversampled groups were still representative of that group in the community from which it was obtained.

On the basis of these considerations, we used a two-step stratified random sampling procedure to recruit the sample. In the first step, we sent announcements about the study to 4,000 parents of children in the third, fourth, sixth, and seventh grades of two school systems in a moderate sized city in the southeastern United States. The two school systems were chosen because one served the immediate urban area and the second served the surrounding region, which was predominantly suburban and rural. Those parents who agreed to have their child participate in the study completed consent forms and a screening questionnaire assessing the presence of *Diagnostic and Statistical Manual of Mental Disorders* (*DSM–IV*; American Psychiatric Association, 1994) symptoms of oppositional defiant disorder (ODD) and conduct disorder (CD; American Psychiatric Association, 1994) and CU traits (Frick & Hare, 2001). Following receipt of the parents' consent forms, the child's teacher completed analogous questionnaires. For each child who participated in this initial phase of screening, his or her teacher received $10 for educational supplies for the classroom. This first phase yielded a sample of 1,136 children that was 53% female and had an ethnic composition that was 77% Caucasian, 19% African American, 1% Hispanic, and 1% Asian American. This ethnic composition closely

matched the demographics of the participating schools. Also, 21% of the children were receiving special education services. The range of Duncan's Socioeconomic Index (Hauser & Featherman, 1977) was 0.00 to 92.30, with a mean of 47.20. Scores of 24 and 64 were at the first and third quartiles of the sample, respectively.

In the second phase of recruitment, the sample of 1,136 children was divided into four groups on the basis of combined parent and teacher ratings of conduct problem symptoms and CU traits. The first group was below the mean on both dimensions ($n = 225$), a second group was at or above the upper quartile on the conduct problem measure but below the mean on the measure of CU traits ($n = 66$), a third group was at or above the upper quartile on the measure of CU traits but below the mean on the measure of conduct problems ($n = 77$), and the last group was above the upper quartile on both dimensions ($n = 128$). These four groups were then stratified on gender, ethnicity, and socioeconomic status. Next, 25 children in each of the four groups were recruited to participate in the study through a random stratified sampling procedure, with the four groups matching the group from which they were sampled on the stratification variables (i.e., gender, ethnicity, socioeconomic status) and with each group having approximately equal numbers of children from the two grade cohorts (i.e., third and fourth grade, sixth and seventh grade). Errors in data collection resulted in the loss of 2 participants.

This recruitment procedure resulted in a sample of 98 participants in this study that filled a 2×2 study design, with level of CU traits and level of conduct problems as the two between-groups factors. The demographic characteristics of this sample are described in Table 1. As is evident from this table, there were differences across groups on some demographic variables, which reflect the characteristics of that group in the larger community sample. Specifically, the presence of CU traits was associated with lower socioeconomic status, lower intelligence, a lower percentage of girls, and a higher percentage of African American children (which was the only minority status represented in the study sample). Because sampling was stopped as soon as 25 subjects in each group agreed to participate, participation rates are not informative, because it is unclear what percentage would have participated in each group had they all been approached. As a result, the key test of the stratified sampling procedure is whether the demographic variables of each cell, representing the subgroups of interest, matched the demographic composition of the same group in the larger community sample. This information is also provided in Table 1.

The sample was reassessed at approximately yearly intervals for the next 3 years. The mean length of time between completion of the screening measures to form the study groups and the last follow-up assessment was 50.91 months ($SD = 4.40$), and the mean length of time between the first and fourth follow-up assessments was 38.60 months ($SD = 2.90$). Ninety-one of the 98 participants (93%) completed three of the four assessments, and 79 participants (81% of the sample) provided data at all four assessments. It is important to note that there was no differential attrition across the four study groups. At the final assessment, there were 19 participants in the group who were high on conduct problems but low on CU traits and 20 participants in each of the remaining three groups.

Measures Obtained at Screening for Group Formation

Antisocial Process Screening Device (APSD). The APSD (Frick & Hare, 2001) is a 20-item behavior rating scale that was completed by each child's parent and teacher during the initial screening. Each item on the APSD is scored on a 3-point scale ranging from 0 (*not at all true*) to 2 (*definitely true*), and the 6-item CU subscale was used to form groups for the follow-up assessments. The CU dimension, which includes items such as "feels bad or guilty," "concerned about the feelings of others," and "does not show emotions," has proven to be the most stable dimension of the APSD across multiple samples (Frick, Bodin, & Barry, 2000), and it had an internal consistency of .76 in the full screening sample. Parent and teacher ratings on the APSD CU scale were correlated ($r = .38$, $p < .001$). We combined ratings from parents and teachers for group formation by using the higher score from either reporter for each item (Piacentini, Cohen, & Cohen, 1992).

Children's Symptom Inventory–4 (CSI-4). The sections of the CSI-4 (Gadow & Sprafkin, 1995) assessing symptoms related to *DSM–IV* criteria for ODD and (CD) were completed by parents and teachers at the initial community screening and were used to form groups for the follow-up assessments. Consistent with the procedure used to combine informants on the APSD, we formed a multiinformant composite by using the highest rating of each symptom. The parent and teacher correlations in the community sample were .29 ($p < .001$) for the CD symptoms and .35 ($p < .001$) for the ODD symptoms. Using a combination of parent and teacher reports on the CSI-4, Gadow and Sprafkin (1995) reported good correspondence between CSI-4 scores and clinician diagnoses in a clinic sample of school-aged children, with sensitivity rates for predicting the diagnoses of ODD and CD of .93.

Table 1
Demographic Characteristics of the Sample

Demographic	Low CU–low CP ($n = 25$)	High CU–low CP ($n = 25$)	Low CU–high CP ($n = 23$)	High CU–high CP ($n = 25$)	Effects	Total ($n = 98$)
Age	12.20 (1.55)	12.68 (2.01)	12.26 (2.71)	12.28 (1.67)		12.36 (1.73)
SES	**54.07**/53.49$_a$ (12.38)	**39.29**/42.10$_{ba}$ (22.46)	**52.86**/54.53$_a$ (19.95)	**37.92**/37.17$_b$ (19.10)	CU[a]	46.67 (19.96)
K-BIT	109.68$_a$ (11.13)	102.72$_{ab}$ (14.55)	107.74$_a$ (11.48)	99.40$_b$ (12.10)	CU[b]	104.83 (12.88)
Cohort (% young)	52	52	48	48		50
Ethnicity (% African American)	**15**/8	**40**/36	**17**/9	**35**/32	CU[c]	21
Gender (% female)	**68**/68	**45**/40	**50**/48	**33**/36	CU[d]	47

Note. Numbers in boldface show the demographic representation of that group in the larger community sample. Values in parentheses indicate standard deviations. Effects are from either 2×2 analysis of variance or 2×2 logit model analyses, with level of callous–unemotional (CU) traits and level of conduct problems (CPs) as the between-groups factors. Means designated with different letters are significantly different from each other ($p < .05$) based on pairwise comparisons according to Duncan's procedure. SES = Duncan's Socioeconomic Index (Hauser & Featherman, 1977); K-BIT = Composite Index from the Kaufman Brief Intelligence Test (Kaufman & Kaufman, 1990).
[a] $F(3, 94) = 14.27$, $p < .001$. [b] $F(1, 94) = 9.30$, $p < .01$. [c] $\chi^2(1, N = 98) = 8.29$, $p < .01$. [d] $\chi^2(1, N = 98) = 4.68$, $p < .05$.

Measures of Potential Mediators of Delinquent Peer Affiliation

Alabama Parenting Questionnaire (APQ). The APQ (Shelton, Frick, & Wootton, 1996) includes 42 items assessing a number of parenting constructs. The primary parenting constructs of interest for the present study were parental involvement in their children's activities and parental monitoring and supervision, given these variables' predicted relation to deviant peer affiliation (e.g., Dishion et al., 1995). Therefore, only the 10-item positively worded (e.g., "How often do you play games or do fun things with your child?") Parental Involvement scale and the 10-item negatively worded (e.g., "How often does your child stay out in the evening past the time he/she is supposed to be home?") Poor Monitoring and Supervision scale were used in analyses. Although both parent and child report formats were collected for the APQ, the parent report of monitoring and supervision and the child report of parental involvement were used in analyses, on the basis of past research showing their relative validity for these constructs (Frick, Christian, & Wootton, 1999). Items on the APQ are rated on a 5-point frequency scale from 1 (*never*) to 5 (*always*). The parent report of poor monitoring and supervision had an internal consistency of .73, and the child report of parental involvement had an internal consistency of .75 in this sample.

The National Institute of Mental Health Diagnostic Interview Schedule for Children–Version 4 (DISC-4). The DISC-4 (Shaffer, Fisher, Lucas, Dulcan, & Schwab Stone, 2000) was developed to correspond to the fourth edition of the *DSM–IV* and was used to assess the impulsive and hyperactive symptoms for a diagnosis of attention deficit hyperactivity disorder (ADHD). The DISC-4 is a highly structured interview designed to be administered by lay interviewers with appropriate training, and it has proven to be highly reliable on both the symptom and the diagnostic level (Lahey et al., 1994). Interviewers were a licensed psychologist and advanced graduate students in psychology who completed a course on the psychological assessment of children and who were trained in standardized administration procedures for the DISC-4. The parent report of ADHD symptoms was used in the current study on the basis of findings supporting the validity of parental perceptions for this symptom domain (Loeber, Green, Lahey, & Stouthamer-Loeber, 1991). In the current sample, parent reports of ADHD symptoms on the DISC-4 were highly correlated ($r = .83$, $p < .001$) with their ratings of similar behaviors on the Hyperactivity subscale of the Basic Assessment System for Children (BASC) parent version (BASC-PRS; Reynolds & Kamphaus, 1992), which suggests that parents were consistent in their reports of these behaviors across these assessment formats.

BASC. The BASC is a behavior rating scale that covers a broad range of both adaptive and maladaptive child behaviors. It has been standardized on a large nationwide sample of children and adolescents and has been proven to produce reliable scores according to several indices of reliability (e.g., internal consistency and test–retest; Kamphaus & Frick, 2002). Each parent and child completed the appropriate forms of the BASC. On the BASC-PRS, *t* scores on the Social Skills subscale were included in analyses. This scale assesses the skills necessary for a child to interact successfully with both peers and adults (e.g., "makes suggestions without offending others"). In the BASC standardization sample, the Social Skills scale yielded a coefficient alpha of .89 and had a 2- to 8-week test–retest reliability of .74 (Reynolds & Kamphaus, 1992). On the self-report version of the BASC, *t* scores on the Social Stress subscale were used in analyses. This scale was designed to assess a child's perception of problems in his or her peer relationships, such as being rejected and excluded from social activities (e.g., "I wish I were invited to more parties"). In the BASC standardization sample, self-report on the Social Stress scale yielded an alpha of .84 and had a 2- to 8-week test–retest reliability of .81 in the BASC normative sample (Reynolds & Kamphaus, 1992).

Involvement in prosocial activities. To assess the level and type of a child's involvement in prosocial activities (Barry, 2000), we gave a semi-structured interview to each child. Children were asked to (a) list the activities or hobbies in which they had been involved in their spare time in the past year, (b) the importance of each, (c) whether they planned to continue participating in the activity in the next year, (d) how many hours per week they spend in each activity, and (e) how good they perceive themselves to be at each activity. We asked similar questions pertaining to the amount of time spent in school-related activities (e.g., doing homework, extracurricular activities) outside of normal school hours. The total number of hours per week during which the child was engaged in prosocial activities outside of school was used in all analyses.

Repeated Assessment of Delinquent Peer Affiliation

The Peer Delinquency Scale (PDS; Keenan et al., 1995) was developed for use in the Pittsburgh Youth study to assess the level of deviant peer group affiliation in a high-risk community sample of approximately the same age as the current sample (see Loeber, Farrington, Stouthamer-Loeber, Moffitt, & Caspi, 1998). On the PDS, participants report on their friends' engagement in a wide variety of disruptive behaviors. Participants were asked to rate how many of their friends engaged in a number of deviant behaviors (e.g., shoplifting, skipping school, selling drugs) in the last 6 months on a 5-point scale, ranging from *all* (4) to *none* (0). Consistent with past research assessing delinquent peer affiliation, any rating above *none* was considered as indicating some level of delinquent peer association, and the number of behaviors in which there was some level of peer involvement was summed (Henry et al., 2001; Lahey et al., 1999; Simons et al., 1991).

The PDS was completed by the child at the initial comprehensive assessment, at the same time as the mediator variable assessments, and each year during the follow-up assessments. The distribution and the internal consistency of the PDS at each assessment are provided in Table 2. The internal consistency estimates ranged from .84 to .89 across the four assessments. As we expected on the basis of the sample recruitment strategy, the level of peer delinquency reported in this sample was between what has been reported in a representative sample of high school students (Crosnoe, 2002) and what has been reported in a high-risk sample of urban African American students (Lahey et al., 1999). The stability coefficients for the PDS scales across assessments are also included in Table 2 and suggest a relatively high level of stability across time for this measure (e.g., $r = .62$, $p < .001$, across 3 years).

Procedure

In keeping with the stratified sampling procedure described above, parents and children who participated in the communitywide screening were contacted and invited to participate in a more comprehensive assessment that included the measures used in the current study (see Frick, Cornell, Bodin, et al., 2003, for a more complete description of the full assessment procedures). Those who were contacted but declined to participate were replaced by someone in the same group in the 2×2 study design with similar demographic characteristics, until 25 participants were recruited for each group. Two participants were lost because of errors in

Table 2

Descriptive Data on Delinquent Peer Affiliation Across Time

Assessment time	M	SD	α	1	2	3	4
1. Time 1	2.27	2.73	0.84	—	.66***	.49***	.62***
2. Time 2	2.74	3.13	0.88		—	.55***	.64***
3. Time 3	2.76	3.02	0.85			—	.76***
4. Time 4	3.49	3.39	0.89				—

*** $p < .001$.

data collection that were not detected until after the comprehensive assessments were completed. Both of these participants were in the group that was high on conduct problems but low on CU traits. However, this did not affect the demographic representation of this group compared with the larger community sample (see Table 1).

For the initial assessment, participants were tested in two sessions, with the procedures standardized for all participants. The first session started with an informed consent procedure conducted with the parent and child together. The parent and child were then separated, and parents were administered a semistructured interview to obtain demographic information, followed by the DISC-4 interview. Following the DISC, the parents completed all of the behavior rating scale measures. In a separate room, the children were administered the Composite Index from the Kaufman Brief Intelligence Test (Kaufman & Kaufman, 1990) as an intellectual screening and all of the self-report measures. Parents received $65 for their participation in the comprehensive assessment procedures, and the youth received a $15 gift certificate to either a local music store or a book store.

The follow-up assessments took place as close to the 1-year anniversary of the initial comprehensive assessment as possible. To reduce attrition, all information collected during the follow-up assessments was completed by phone and mail. The PDS was included in the phone interview conducted with each child participant. Parents received $65 for their participation in each follow-up assessment, and the youth received a $15 gift certificate to either a local music store or a bookstore.

Results

Peer Delinquency and Conduct Problem Groups

The first set of analyses consisted of a series of 2×2 analyses of variance (ANOVAs), with level of CU traits and level of conduct problems as the two factors and peer delinquency at all four assessment periods as the dependent variables. The results of these analyses are provided in Table 3. The results for the initial comprehensive assessment (Time 1) and the first follow-up assessment (Time 2) were very consistent. That is, there was a main effect for CU traits but no significant effect for conduct problems

and no significant interaction effect. As illustrated in Table 3, the group of children high on CU traits and conduct problems showed the highest level of delinquent peer affiliation at both of the first two assessment points, differing from both the control group and the other group of youth with conduct problems alone. Further, and somewhat counter to our expectations, the group of children high on CU traits but without conduct problems at the time of group formation had the second highest level of delinquent peer affiliation, although they only differed significantly from the control group at Time 2.

These effects changed somewhat at the Time 3 and Time 4 assessments. There was a significant main effect for conduct problems for delinquent peer involvement at Time 3 and a significant interaction effect at Time 4. As is evident from the means reported in Table 3, the group that was high on CU traits and conduct problems continued to show the highest level of delinquent peer involvement at these later assessment points. In contrast, the group high on CU traits but low on conduct problems declined somewhat in its deviant peer involvement, whereas the remaining two groups increased somewhat in their peer involvement. These trends across assessment points are illustrated in Figure 1.

As noted in Table 1, there were significant differences across groups on several demographic variables. These variables could have contributed to group differences if they were also associated with peer delinquency. When race, sex, socioeconomic status, and intelligence were correlated with peer delinquency, the only significant correlations were for sex ($r = -.19$, $p < .05$) and intelligence ($r = -.22$, $p < .05$) at Time 1 and intelligence at Time 2 ($r = -.21$, $p < .05$). These analyses revealed that girls at Time 1 were less likely to have delinquent peers and that lower intelligence was associated with more delinquent peer affiliation at the first two assessment points. When the groups were compared on delinquent peer affiliation after both sex and intelligence were

Table 3

Means and Standard Deviations of Peer Delinquency Across the Four Groups Over Time

Time and statistic	Low CU– low CP	Low CU– high CP	High CU– low CP	High CU– high CP	F
Time 1					
n	24	23	25	25	CU; $F(1, 93) = 8.11$**
M	1.38_a	1.61_a	2.64_{ab}	3.40_b	
SD	2.16	2.08	3.17	2.93	
Time 2					
n	24	22	24	23	CU; $F(1, 89) = 18.50$***
M	1.21_a	1.73_{ab}	3.33_{bc}	4.70_c	
SD	2.30	1.20	3.80	3.31	
Time 3					
n	20	21	23	22	CP; $F(1, 82) = 4.58$*
M	2.00_a	2.62_{ab}	2.13_a	4.23_b	
SD	2.62	1.75	2.42	4.30	
Time 4					
n	20	19	20	20	CU $\times$ CP; $F(1, 75) = 4.54$*
M	3.40_{ab}	2.74_a	2.65_a	5.15_b	
SD	3.72	2.18	2.72	4.15	

Note. Means designated with different letters are significantly different from each other ($p < .05$) based on pairwise comparisons according to Duncan's procedure. F values are from a 2×2 analysis of variance with callous–unemotional (CU) traits and conduct problems (CP) as the independent factors.

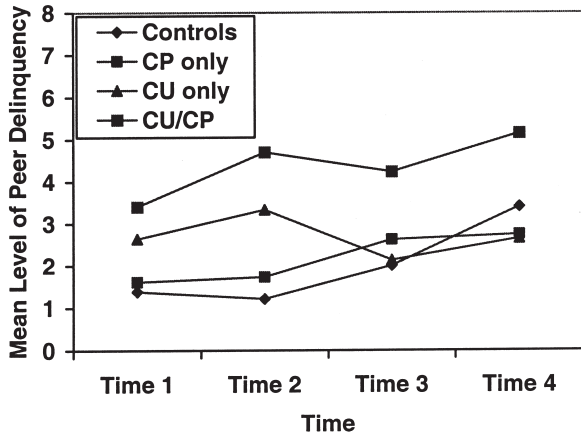* $p < .05$.   ** $p < .01$.   *** $p < .001$.

Figure 1. Patterns of delinquent peer affiliation across time for groups with differing levels of conduct problem (CP) and callous–unemotional (CU) traits.

controlled, all of the effects reported in Table 3 remained significant. At Time 1 and Time 2, the main effect of CU traits was still significant, Time 1, $F(1, 91) = 3.75$, $p < .05$; Time 2, $F(1, 87) = 13.77$, $p < .001$. At Time 3, the main effect for conduct problems also remained significant, $F(1, 80) = 3.71$, $p < .05$, as did the interaction between conduct problems and CU traits at Time 4, $F(1, 73) = 4.56$, $p < .05$.

Another important issue for interpreting the different levels of peer delinquency across groups concerns whether group differences in the level of peer delinquency at later time points were solely accounted for by differences in initial levels of peer delinquency or whether groups also differed after initial levels were controlled. Therefore, a series of 2×2 analyses of covariance (ANCOVAs) was conducted, with Time 2, Time 3, and Time 4 levels of delinquent peer affiliation as dependent variables but with Time 1 peer delinquency as a covariate. The results for Time 2 and Time 3 remained essentially unchanged in these analyses, with the main effect for CU traits at Time 2, $F(1, 88) = 10.35$, $p < .01$, and

the main effect for conduct problems at Time 3, $F(1, 81) = 3.95$, $p < .05$, remaining significant. However, the interaction between CU traits and conduct problems in predicting Time 4 peer delinquency was no longer significant in these analyses, $F(1, 74) = 2.58$, *ns*.

Mediators of Delinquent Peer Affiliation

The second goal of the study was to test for potential mediators of the relation between conduct problem groups and deviant peer affiliation. According to the classic definition of mediation proposed by Baron and Kenny (1986), a potential mediator must be associated with the study groups and with delinquent peer affiliation. Further, the association between study groups and delinquent peer association must be either eliminated (full mediation) or substantially reduced (partial mediation) after the effects of the mediator variables are controlled. To determine whether the first condition of mediation was met, we conducted 2×2 ANOVAs with the five potential mediators as the dependent variables. The results of these analyses are reported in Table 4. As is evident from T4 this table, the two parenting variables and the two social functioning variables showed main effects for CU traits, with children high on CU traits showing more dysfunctional parenting and more problematic social adjustment. This was especially true for children with both CU traits and conduct problems. This latter finding is reflected in an additional main effect for conduct problems for the two measures of social functioning. The measure of impulsivity showed only a main effect for conduct problems, and the time spent in prosocial activities was not related to either CU traits or conduct problems in these analyses.

The associations between these potential mediators and peer delinquency at each assessment point are provided in Table 5. As T5 is evident from Table 5, the two parenting variables were consistently associated with peer delinquency, as they were significantly correlated in seven of the eight possible correlations. The only other correlations to reach significance were for the social adjustment variables. However, these variables were associated with

Table 4

Means and Standard Deviations of Mediator Variables in the Full Sample and Across the Four Groups

Variable	Full sample		Low CU–low CP		Low CU–high CP		High CU–low CP		High CU–high CP		F
	M	SD	M	SD	M	SD	M	SD	M	SD	
Parental monitoring and supervision	14.70	4.43	13.16$_a$	3.51	13.40$_a$	3.40	14.88$_{ab}$	4.21	17.24$_b$	5.26	CU; $F(1, 94) = 10.84$**
Parental involvement	36.56	6.70	39.32$_a$	6.56	37.27$_{ab}$	6.08	35.39$_b$	7.16	34.32$_b$	6.20	CU; $F(1, 94) = 6.80$*
Impulsivity	0.85	1.66	0.88$_a$	1.48	2.30$_{ab}$	2.51	1.24$_a$	2.35	2.92$_b$	3.11	CP; $F(1, 94) = 9.97$**
Social skills	46.74	10.97	54.00$_a$	7.78	48.13$_b$	8.55	46.76$_b$	11.16	38.20$_c$	10.07	CU; $F(1, 94) = 19.99$*** CP; $F(1, 94) = 14.12$***
Social stress	42.93	6.91	39.80$_a$	5.26	42.00$_a$	5.94	42.56$_a$	6.10	47.32$_b$	8.05	CU; $F(1, 94) = 9.65$** CP; $F(1, 94) = 7.16$**
Total time spent in prosocial activities	30.74	16.25	31.60	18.58	33.96	26.22	42.04	32.76	32.32	23.37	*ns*

Note. Means designated with different letters are significantly different from each other ($p < .05$) based on pairwise comparisons according to Duncan's procedure. F values are from a 2×2 analysis of variance with callous–unemotional (CU) traits and conduct problems (CP) as the independent factors.
* $p < .05$. ** $p < .01$. *** $p < .001$.

Table 5

Correlations Between Peer Delinquency and Mediator Variables

Variable	Time 1 peer delinquency	Time 2 peer delinquency	Time 3 peer delinquency	Time 4 peer delinquency
Parental monitoring and supervision	.38***	.40***	.28**	.42***
Parental involvement	−.31**	−.33**	−.28**	−.20
Impulsivity	.13	−.01	.04	.09
Social skills	−.38***	−.37***	−.08	−.18
Social stress	.44***	.36***	.19	.22*
Total time spent in prosocial activities	.01	.06	−.05	.01

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

peer delinquency largely at the first two assessments, although the correlation between the social stress variable and peer delinquency at Time 4 also reached significance ($r = .22$, $p < .05$).

On the basis of these analyses, the only potential mediators that were significantly associated with the study groups and with peer delinquency variables were the two measures of social adjustment and the two parenting variables. Therefore, these variables were tested as potential mediators in subsequent analyses. The two peer-related variables and the two parenting variables were tested together, because (a) they were considered to be measuring a similar construct and (b) they provided one self-report and one parent report measure of each dimension. We tested the effects of these potential mediator variables on the associations between peer delinquency and conduct problem groups by repeating the 2×2 ANOVAs reported in Table 3, with CU traits and conduct problems as the independent variables and peer delinquency as the dependent variable. However, we compared the effects before and after controlling for either the social adjustment variables, the parenting variables, or both. The F values and effect sizes (eta squared) from these analyses are provided in Table 6.

The results of these analyses suggest that the main effects of CU traits in the first two waves of data collection could largely be accounted for by the parenting and social adjustment variables. That is, the effect size for CU traits with no covariates ($\eta^2 = .08$) was substantially reduced ($\eta^2 = .001$) after these potential mediators were controlled. The strongest evidence for mediation appeared to be for the social adjustment variables. Also, at Time 2, the effect size for CU traits before we controlled for covariates ($\eta^2 = .172$) was substantially reduced ($\eta^2 = .056$) after we controlled for the covariates, but this latter effect was still significant, providing evidence for only partial mediation (Holmbeck, 1997). The evidence for mediation was much weaker at the last

two assessment periods. For example, at Time 4, the CU Traits $\times$ Conduct Problems interaction had an effect size of .057 before we controlled for the mediators, and this effect size changed somewhat ($\eta^2 = .037$) after we controlled for the mediators. However, this change in effect size (.020) was quite modest in magnitude.

As we indicated previously, there was no differential attrition across the main study groups. However, it is still possible that there was differential attrition in terms of the characteristics of those who did and did not continue within the study groups. To test for this possibility, we divided each of the four groups into those who completed the Time 4 assessment and those who did not. We compared these groups on Time 1 measures. The results of these analyses indicated that there was a significant interaction between group and study completion, $F(3, 89) = 3.03$, $p < .05$, on the Time 1 measure of peer delinquency. This interaction was because, within children high on CU traits but low on conduct problems, those who completed the Time 4 assessments had much lower levels of peer delinquency ($M = 1.90$, $SD = 2.65$) at Time 1 than those who did not complete the study ($M = 5.60$, $SD = 3.65$). This finding suggests that the apparent decline in the relative rate of delinquent peer affiliation for this group (see Figure 1) could be at least partly due to attrition. None of the other groups showed evidence for differential attrition on the peer delinquency measure. The only other interaction between study completion and group membership that emerged from these analyses was for time spent in prosocial activities, $F(3, 89) = 3.01$, $p < .05$. This interaction was due to the much lower levels of time spent in prosocial activities ($M = 19.00$, $SD = 11.73$) by children who did not complete the study compared with those who did complete the study ($M = 34.75$, $SD = 18.84$) for participants in the control group only.

Table 6

Significance and Effect Sizes for Total Peer Delinquency Across Time With no Covariates and Covarying Potential Mediators

Peer delinquency	No covariates		Covarying parenting		Covarying social adjustment		Covarying both	
	F	η^2	F	η^2	F	η^2	F	η^2
Time 1	CU; $F(1, 93) = 8.11**$	.080	CU; $F(1, 91) = 2.63$	.028	CU; $F(1, 91) = 0.34$	.004	CU; $F(1, 89) = 0.08$	.001
Time 2	CU; $F(1, 89) = 18.50***$	.172	CU; $F(1, 87) = 10.21**$	.105	CU; $F(1, 87) = 5.94*$	.064	CU; $F(1, 85) = 5.00*$	.056
Time 3	CP; $F(1, 82) = 4.58*$	.053	CP; $F(1, 80) = 3.71$	.044	CP; $F(1, 80) = 3.79$	.045	CP; $F(1, 78) = 4.97*$	.060
Time 4	CU $\times$ CP; $F(1, 75) = 4.54*$	.057	CU $\times$ CP; $F(1, 73) = 3.04$	.040	CU $\times$ CP; $F(1, 73) = 3.80$	.049	CU $\times$ CP; $F(1, 71) = 2.74$	.037

Note. CU = callous–unemotional; CP = conduct problem.
* $p < .05$. ** $p < .01$. *** $p < .001$.

Discussion

Two consistent findings in research on antisocial youth are that (a) there are subgroups of youth with antisocial behavior who differ on a number of theoretically important characteristics (e.g., Frick, 1998; Moffitt, 1993; Patterson et al., 1992) and (b) antisocial youth tend to associate with antisocial peers (e.g., Fergusson et al., 2002; Keenan et al., 1995). However, little research has investigated whether subgroups of antisocial youth differ in the degree of their delinquent peer affiliation or in the potential factors leading to this affiliation. A notable exception is the study by Moffitt et al. (1996) indicating that children with a childhood onset and those with an adolescent onset to their antisocial behavior showed equally high levels of delinquent peer affiliation.

Whereas groups based on symptom onset may not show different levels of deviant peer affiliation, our findings suggest that antisocial youth who show a CU interpersonal style may exhibit the greatest level of delinquent peer affiliation. Past research in other samples (e.g., Christian et al., 1997; Lynam, 1997) and in the sample used in the present study (Frick, Cornell, Barry, et al., 2003) has indicated that the group of children with CU traits show a more severe and aggressive pattern of conduct problems than other antisocial youth. The current findings extend this work by suggesting that these children also show a high level of delinquent peer affiliation and that this affiliation could contribute to the greater severity of their antisocial behavior (Lahey et al., 1999).

As we noted previously, there is a growing body of research documenting different correlates to conduct problems in children with and without CU traits, including findings from the current sample (Frick, Cornell, Bodin, et al., 2003). These findings have led to models suggesting that the processes involved in the development of conduct problems may differ for children with and without CU traits (see Frick, 1998; Frick, Barry, & Bodin, 2000; Frick & Morris, 2004). However, this work has largely focused on dispositional characteristics of this group, such as personality traits (e.g., Frick, Lilienfeld, et al., 1999), cognitive styles (e.g., Barry et al., 2000), and patterns of emotional processing (e.g., Blair, 1999). Little work has focused on the social context of children with CU traits. Therefore, this study is one of the first to document specific aspects of these children's social context that could also be important for understanding the causes or the severity of their behavior problems.

Documenting the strong affiliation with delinquent peers in children with CU traits is also important because it provides additional evidence that the presence or absence of CU traits is not analogous to the distinction made in past research between undersocialized and socialized antisocial youth (see Frick & Ellis, 1999, for a review). That is, many definitions of undersocialized aggressive youth have included characteristics associated with CU traits (e.g., a lack of concern for the feelings, wishes, and well-being of others), but they have also specified that these youth often commit their antisocial acts alone and outside the context of delinquent peers (e.g., Quay, 1993). Our results suggest that, despite their callous interpersonal style, children in this group do affiliate with deviant peers.

It is interesting that, at some of the early waves of data collection, CU traits were associated with peer delinquency, even in the absence of conduct problems. Further, the one piece of evidence for differential attrition found in this sample was the loss of several children in this group with high levels of delinquent peer affiliation at later assessments, which suggests that the apparent lack of differences at later assessments could have been due to attrition rather than to changes in the children's relative level of delinquent peer affiliation. This is an interesting group of children that warrants additional research. On the basis of parent and teacher reports at the time of group formation, this group showed a lack of guilt, a lack of empathy, and other aspects of the CU dimension. However, these children were not rated as having significant conduct problems by the informants. In other analyses using this data set, this group of children with CU traits was at risk for later self-reports of delinquent behavior (Frick, Cornell, Barry, et al., 2003), which suggests that either they were able to avoid detection of their antisocial behavior or their antisocial behavior developed later. In either case, it suggests that interventions that seek to prevent delinquency by intervening early for children with conduct problems may miss a group of at risk children if the presence of CU traits is ignored (Frick, 1998, 2001).

Given the tendency of youth with CU traits to associate with delinquent peers, it is critical to determine what factors may contribute to this peer affiliation. In the current study, we tested several potential mediators. Several factors that have been proposed in past research as potentially placing children at risk for delinquent peer involvement, notably level of impulsivity (Gottfredson & Hirschi, 1990) and a lack of involvement in activities with prosocial peers (Wiatrowski & Anderson, 1987), did not appear to mediate the association with deviant peers in this sample. Instead, there was evidence for the importance of parental involvement and supervision and children's social adjustment (Coie et al., 1995; Simons et al., 1991; Vitaro et al., 2000). The mediational role of these variables in youth with CU traits is somewhat surprising, given past research indicating that the antisocial behavior of children with CU traits is less strongly associated with dysfunctional parenting practices than it is for children without these traits (Wootton et al., 1997). It may be that parenting, specifically parental involvement and supervision, is important for reducing the child's ability to associate with deviant peers, even if it is less important for explaining the development of antisocial behavior.

There are two important caveats for these findings on the mediational role of both parenting and social adjustment. First, although the strength of the association between CU traits and delinquent peer affiliation was reduced substantially after we controlled for the mediators, CU traits were still significantly associated with peer delinquency at the second assessment. Thus, it is still possible that other factors are involved in these children's tendency to affiliate with delinquent peers. Second, the evidence for mediation was strongest at the earliest follow-up assessments. As a result, these mediators may be most important during the late childhood and early adolescent period. Later in adolescence, antisocial youth may become more adept at circumventing parental attempts to monitor their behavior. Further, the antisocial behavior of youth with CU traits may make them more acceptable to other deviant youth, even in the absence of adaptive social skills. For example, adolescents with CU traits emphasize the positive and instrumental value in antisocial and aggressive behaviors (e.g., to obtain dominance; Pardini et al., 2003), which makes other antisocial individuals an attractive peer network for this group of youth. All of these possibilities are speculative and require testing in future research. However, they illustrate the importance of

considering the possibility that mediators of peer delinquency may change across development.

It is important to view these findings in the context of a number of limitations in the study. Specifically, at our first assessment, CU traits were already significantly associated with peer delinquency. As a result, it is impossible to make causal interpretations of this association, as it is possible that certain characteristics of children with CU traits (e.g., more thrill and adventure seeking) make them more likely to seek out deviant peers or that associating with deviant peers contributes to the development of a callous interpersonal style (e.g., desensitizes children to the harmful effects of their behavior on others). Our analyses of later peer delinquency indicated that the group differences at two of the three later assessments remained significant after we controlled for initial levels of peer delinquency. This provides some support for the possibility that group differences predict changes in levels of peer delinquency over time. However, this conclusion needs to be qualified by the fact that group differences at the last time point were no longer significant after we controlled for initial levels of peer delinquency.

Another limitation in the study design is that peer status, one of the key proposed mediators in the study, was assessed by parent and child report rather than through peer ratings. It is possible that parents may not be aware of their children's social adjustment, and, more problematically, there is evidence that children with conduct problems overestimate their level of peer acceptance in self-report ratings (David & Kistner, 2000; Edens, 1999). Therefore, a stronger mediational role for peer acceptance may have been detected if peer perceptions of social skills and social acceptance had been obtained. Similarly, another potential mediator, impulsivity, was only assessed through parental report. Again, a multiinformant assessment of this variable might also have resulted in stronger findings for its potential mediating role (Kamphaus & Frick, 2002).

Delinquent peer involvement was based solely on the child's self-report. This is the typical method used to assess this construct in past research, and it has shown substantial predictive validity (e.g., Fergusson et al., 2002; Keenan et al., 1995). For example, Fergusson et al. (2002) reported that self-report of delinquent peer affiliation obtained at ages 14 and 15 predicted criminal behavior 6 years later (i.e., ages 20 and 21). It is important to note that many past studies used self-report for assessing antisocial behavior in both the child and his or her peers, which resulted in shared method variance that could have inflated correlations between these constructs (e.g., Henry et al., 2001). In the current study, the assessment of conduct problems and CU traits was based on parent and teacher reports, which limited the effects of method variance. Further, because the peer delinquency variable assesses the behavior of the child's peers, not the behavior of the child himself or herself, it is not clear that the same inflation bias found in reports of self-adjustment in children with conduct problems would operate in the child's ratings of peer delinquency. However, the use of self-report does make possible an alternative interpretation for our findings. Specifically, it may be that youth with CU traits are more willing to admit their involvement with delinquent peers than are other youth.

Another important limitation of the study is that the size of our sample, especially within specific groups of antisocial youth, was modest. Although the fact that we did detect some significant associations suggests that we had adequate power to detect moderate to large effects, some associations may not have emerged because of low power. Also, the small sample prevented us from testing whether the findings might be moderated by other variables, such as the child's sex, ethnicity, or grade cohort. In addition, the small sample magnifies the effects of attrition at the later waves of data collection, especially for the group of youth who were high on CU traits without conduct problems. As noted previously, the analyses of differential attrition suggest that we may have underestimated the delinquent peer involvement of this group at later assessment points.

Although our sampling strategy did attempt to recruit a high-risk sample that included more antisocial youth than would be typical in an unselected community sample, the nonreferred nature of the sample makes it unclear whether these youth would show the same level of severity as youth in clinic-referred or forensic samples. Further, the geographic region was a mix of urban and suburban areas in a moderate-sized city. The influence of deviant peers may be different in large urban areas, where there may be greater opportunity for unsupervised antisocial activities (Henry et al., 2001).

Given these limitations, it is important that our results be replicated before firm conclusions are made. However, they do support the need for further research investigating whether some groups of antisocial youth are more likely to associate with delinquent peers than others and whether the mediators of this association differ across groups. Our results suggest that children with CU traits, a group that has proven to be different from other antisocial youth in a number of respects, may be highly likely to associate with deviant peers. Additional research is needed to clarify why this is the case. More generally, these findings suggest that more attention needs to be paid to the social context of this group of youth to more fully understand their propensity for antisocial and aggressive behavior. Understanding the social context of these children could prove to be important for improving treatments for this group of antisocial youth, for whom more effective interventions are needed (Frick, 1998, 2001). Given the severity of the aggressive and antisocial behavior in this group, developing more effective prevention and intervention programs that specifically target processes involved in the onset or stability of their problem behavior should be a high priority.

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