Callous–Unemotional Traits and Developmental Pathways to Severe Conduct Problems

Paul J. Frick and Amy H. Cornell
University of New Orleans

S. Doug Bodin, Heather E. Dane, and
Christopher T. Barry
University of Alabama

Bryan R. Loney
Florida State University

One method for defining pathways through which children develop severe conduct problems is based on the presence or absence of callous–unemotional (CU) traits. This study investigated potential differences between nonreferred children (mean age = 12.36 years; SD = 1.73) with and without CU traits (n = 98). Children with conduct problems, irrespective of the presence of CU traits, tended to have significant problems in emotional and behavioral regulation. In contrast, CU traits, irrespective of the presence of conduct problems, were associated with a lack of behavioral inhibition. Hostile attributional biases were associated with conduct problems but only in boys and in the absence of CU traits. These findings suggest that the processes underlying deficits in emotional and behavioral regulation in children with conduct problems may be different for children with CU traits.

Equifinality is an important developmental concept which recognizes that the same outcome can be the result of many different developmental processes. Unfortunately, this concept is often ignored in the study of psychopathological outcomes, which are often, either implicitly or explicitly, viewed as resulting from similar initial conditions or from a single pathogenic process (Cicchetti & Rogosch, 1996). One area in childhood psychopathology in which the potential importance of using the concept of equifinality has been clearly articulated is in the study and treatment of antisocial, delinquent, and aggressive behavior patterns (Frick, 1998b; Richters, 1997). It has long been recognized that children and adolescents who show severe and impairing levels of antisocial behavior, often classified as having a "conduct disorder," constitute a very heterogeneous group of children with substantial variations in the correlates of their behavior and in the developmental courses of their behavioral difficulties (see Frick & Ellis, 1999, for a review). These variations provide some clues as to the potentially different causal pathways through which such behavior patterns can develop.

One example of this type of research involves the distinction between children whose severe antisocial and aggressive behavior begins early in childhood and children whose antisocial behavior begins in adolescence, a distinction that has become more widespread with the publication of the fourth edition of the *Diagnostic and Statistical Manual of Mental Disorders* (*DSM–IV*; American Psychiatric Association, 1994). The *DSM–IV* recognizes childhood-onset and adolescent-onset subtypes of conduct disorder, and this recognition was based on research showing that the two subtypes exhibit distinct developmental trajectories and correlates. Specifically, children showing the childhood-onset pattern tend to show behavior problems early in childhood that tend to worsen over development (Lahey & Loeber, 1994), and these children are more likely to continue to show antisocial and criminal behavior into adulthood (Frick & Loney, 1999). In addition, children in the childhood-onset group are characterized by more aggression, more cognitive and neuropsychological disturbances (e.g., executive functioning deficits, autonomic nervous system irregularities), greater impulsivity, greater social alienation, and more dysfunctional family backgrounds than are children in the adolescent-onset group (see Frick, 1998b; Moffitt, 1993; Moffitt, Caspi, Dickson, Silva, & Stanton, 1996).

These differences in the developmental trajectories and correlates of the two types of conduct disorder suggest that the childhood-onset group has a more characterological disturbance, resulting from a transactional process between a vulnerable temperament in the child and his or her experience of an inadequate rearing environment (Frick, 1998b; Moffitt, 1993). In contrast, children in the adolescent-onset group show less temperamental and psychosocial adversity, yet they still show a severe and impairing pattern of antisocial behavior (Moffitt et al., 1996). In addition, they tend to reject traditional status hierarchies and religious rules, and they associate with deviant peers (Moffitt et al., 1996). As a result, adolescents in this group seem to show an

Paul J. Frick and Amy H. Cornell, Department of Psychology, University of New Orleans; S. Doug Bodin, Heather E. Dane, and Christopher T. Barry, Department of Psychology, University of Alabama; Bryan R. Loney, Department of Psychology, Florida State University.

Correspondence concerning this article should be addressed to Paul J. Frick, Department of Psychology, University of New Orleans, 2001 Geology & Psychology Building, New Orleans, Louisiana 70148. E-mail: pfrick@uno.edu

exaggeration of the normative developmental process involving separation and individuation that is crucial to identity formation in adolescence. Because of this developmental task, engaging in forbidden behaviors with peers can engender feelings of independence and maturity, albeit in a misguided manner (Moffitt, 1993).

In an attempt to expand on this basic model, another line of research has attempted to divide children in the childhood-onset pathway into even more homogeneous groups. Specifically, children in the childhood-onset group seem to be characterized by poor emotional and behavioral regulation (Frick, 1998b; Moffitt, 1993). However, the developmental processes leading to this poor emotional and behavioral regulation may be different for subgroups of children within the childhood-onset subtype. A marker for these different patterns of emotional dysregulation may be the presence or absence of callous–unemotional (CU) traits (see Frick, Barry, & Bodin, 2000, and Frick & Ellis, 1999, for reviews of this subtyping approach). CU traits refer to a specific affective (e.g., absence of guilt, constricted display of emotion) and interpersonal (e.g., failure to show empathy, use of others for one's own gain) style that is characteristic of a subgroup of children with severe conduct problems (Christian, Frick, Hill, Tyler, & Frazer, 1997; Frick, Barry, & Bodin, 2000; Frick, O'Brien, Wootton, & McBurnett, 1994). Children with conduct problems who also show CU traits tend to be more thrill and adventure seeking (Frick, Lilienfeld, Ellis, Loney, & Silverthorn, 1999), are less sensitive to cues of punishment when a reward-oriented response set is primed (Fisher & Blair, 1998; O'Brien & Frick, 1996), and are less reactive to threatening and emotionally distressing stimuli (Blair, 1999; Loney, Frick, Clements, Ellis, & Kerlin, in press) than are other children with conduct problems. These characteristics suggest that conduct problem children with CU traits may show a temperamental style associated with low emotional reactivity to aversive stimuli that is characterized physiologically by underreactivity in the sympathetic arm of the autonomic nervous system and behaviorally by low fearfulness to novel or threatening situations and poor responsiveness to cues to punishment (Kagan & Snidman, 1991).

Research has shown that this temperament, labeled as *low behavioral inhibition*, can contribute to the development of CU traits in several ways (Kochanska, 1993). For example, low behavioral inhibition could place a child at risk for missing some of the early precursors to empathic concern that involve emotional arousal evoked by the misfortune and distress of others, could lead a child to be relatively insensitive to the prohibitions and sanctions of parents and other socializing agents, and could create an interpersonal style in which the child becomes so focused on the potential rewards and gains of using aggression or other antisocial means to solve interpersonal conflicts that he or she ignores the potentially harmful effects of this behavior on him- or herself and others. There is evidence from research to support these potential mechanisms. For example, antisocial and delinquent youth who show CU traits are less distressed by the negative effects of their behavior on others (Blair, Jones, Clark, & Smith, 1997; Frick et al., 1999; Pardini, Lochman, & Frick, in press), are more impaired in their moral reasoning and empathic concern toward others (Blair, 1999; Pardini et al., in press), expect more instrumental gain (e.g., obtaining goods or social goals) from their aggressive actions, and are more predatory in their violence than are antisocial youth

without these traits (Caputo, Frick, & Brodsky, 1999; Pardini et al., in press).

In contrast to those youth with CU traits, children with conduct problems who do not display these traits exhibit several characteristics which suggest that different developmental processes may be underlying their aggressive and antisocial behavior. Specifically, they tend to be highly reactive to emotional and threatening stimuli (Loney et al., in press), and they tend to respond more strongly to provocations in social situations (Pardini et al., in press). Also, their aggressive and antisocial behavior is more strongly associated with dysfunctional parenting practices (Wootton, Frick, Shelton, & Silverthorn, 1997) and with deficits in intelligence (Loney, Frick, Ellis, & McCoy, 1998) than is the aggressive and antisocial behavior of children with conduct problems who are high on CU traits. These findings suggest that antisocial children who do not show high levels of CU traits may have problems in behavioral and emotional regulation that are related to high levels of emotional reactivity. Such poor emotional regulation can result from a number of interacting causal factors, such as inadequate socialization in their rearing environments, deficits in intelligence that make it difficult for them to delay gratification and anticipate consequences, or temperamental problems in response inhibition. The problems in emotional regulation can lead to impulsive and unplanned aggressive acts for which the child may be remorseful afterward but which he or she still has difficulty controlling. Emotion regulation problems can also lead to a higher susceptibility to anger because of perceived provocations from peers leading to violent and aggressive acts within the context of high emotional arousal.

In summary, research suggests that the presence of CU traits has the potential for differentiating antisocial youth with different patterns of emotional regulation underlying their antisocial behavior (e.g., differences in emotional reactivity to aversive stimuli) that could lead to differences in how they react to their socializing environments (e.g., differences in their distress over misdeeds or differences in their reactivity to perceived provocations in peer interactions) and result in different patterns of aggressive behavior (e.g., reactive aggression in the context of high emotional arousal or proactive aggression for instrumental gain). As a result, this approach to subtyping children with conduct problems has the potential for integrating and extending many of the existing models that have proposed different developmental pathways to antisocial and aggressive behavior (Frick & Ellis, 1999). Although this research is promising, most of the research to date has been conducted with clinic-referred or forensic samples of youth, with many of the samples overlapping (see Frick, 1998a, and Frick, Barry, & Bodin, 2000, for reviews). As a result, these findings are in need of replication in independent samples and in nonreferred samples that are less susceptible to potential referral biases and differential prosecution rates.

Also, the use of clinic-referred and forensic samples makes it unclear whether the characteristics associated with antisocial children who show CU traits are also characteristic of all children with CU traits or only those with serious antisocial behavior who are represented in disturbed or adjudicated samples. In the model outlined above, we explicitly attempted to link findings on antisocial and delinquent youth with CU traits to research on the normative processes involved in the development of guilt, empathy, and internalization of prosocial values and norms. However,

an alternative possibility is that the processes underlying severe deficits in the development of empathy and guilt found in antisocial persons with CU traits may be qualitatively distinct from the processes involved in the normative variations in the development of conscience (Hart & Hare, 1997). To begin to address this important issue requires studying children with CU traits who show no significant conduct problems, in order to determine if such children show characteristics (e.g., lack of behavioral inhibition to negative stimuli) that are similar to those found in children with severe conduct problems who show CU traits. Not only is this type of study important for causal theory, but it could also have important implications for prevention in that it would lead to the study of factors that might inhibit a child with CU traits from acting in a severely aggressive and antisocial manner.

These considerations provide important reasons for studying children with conduct problems and children with CU traits in a nonreferred sample. However, there are also serious limitations to studying severe antisocial behavior and potential subgroups of antisocial children in community samples. Specifically, because only a minority of all children in a community sample show severe conduct problems, it is necessary to collect data on a large number of children to have a large enough sample of children with serious conduct problems to divide into subgroups and still have sufficient power to detect differences between subgroups. This is particularly problematic if the group with CU traits is only a minority of all the children with conduct problems, albeit a minority that may show an especially severe pattern of antisocial and aggressive behavior (Christian et al., 1997). Without sufficiently large sample sizes or without using a sampling technique that oversamples children with serious conduct problems, one would only have sufficient power to detect the processes related to the larger subgroup of children with conduct problems, and the potential significance of processes that are uniquely related to the smaller subgroup would be minimized.

Because of these considerations, the current study investigated the processes related to the problems in emotional regulation experienced by subgroups of children with severe conduct problems in a nonreferred sample. However, in order to ensure that there were enough children with severe conduct problems and enough children with significant levels of CU traits for us to detect differential correlates, we recruited a select sample of children designed to ensure adequate representation of children high on these dimensions. Also, in recruiting this sample, which purposefully oversampled children with CU traits and conduct problems, a design was chosen that ensured that the sample was representative of children in the community along several demographic variables. That is, the distributions of CU traits and conduct problems in the sample were not representative of the distributions that would be found in the broader community, but the demographic characteristics associated with these dimensions were representative.

In this nonreferred sample, we tested several basic assumptions from the model outlined above. We predicted that conduct problems, irrespective of the presence of CU traits, would be associated with measures of emotional and behavioral dysregulation. Thus, on these measures we predicted a main effect for conduct problems that would not be modified by the presence or absence of CU traits. However, on the basis of this model, we hypothesized that children with conduct problems would show different processes underlying this dysregulation depending on the presence or absence of CU

traits. We predicted that children with conduct problems and CU traits would show a lack of behavioral inhibition to novel and dangerous activities, to cues of punishment, and to other negative emotional stimuli. Although these predictions follow directly from previous research, we also speculated that children with CU traits but without conduct problems would also show this lack of behavioral inhibition, on the basis of research on the normal development of empathy and guilt. Therefore, we predicted a main effect of CU traits on measures of behavior inhibition that would not be modified by the presence of severe conduct problems. Finally, we hypothesized that the emotional dysregulation associated with conduct problems in children without CU traits would be associated with tendencies to react strongly and negatively to emotional stimuli and perceived provocation. Because such strong reactivity was hypothesized to be specific to children with conduct problems who do not show CU traits, we predicted an interaction between CU traits and conduct problems on these measures.

Method

Participants

Selection of participants for this study was done in two phases. First, announcements were sent to approximately 4,000 parents of children in the third and fourth grades (younger cohort) and in the sixth and seventh grades (older cohort) of two public school systems of a moderate-sized city in the southern United States. Parents who agreed to participate and who completed an informed consent form were sent a questionnaire that assessed for CU traits and a questionnaire that assessed for the *DSM–IV* symptoms of oppositional defiant disorder (ODD) and conduct disorder (CD; American Psychiatric Association, 1994). Once the consent forms and questionnaires were received from the parents, the child's teacher completed analogous questionnaires. The child's classroom received $10.00 for educational supplies for each student participating in this screening project. This procedure resulted in a sample of 1,136 children that closely approximated the participating school districts in that 53% were girls, 19% were African American, 77% were Caucasian, and 21% were receiving special education services through the school system. There was a normative range of socioeconomic status (SES) represented in this sample, with a mean Duncan's socioeconomic index (SEI; Hauser & Featherman, 1977) of 47.20 ($SD = 23.8$), a range from 0 to 92.3, and scores of 24 and 64 at the first and third quartiles, respectively, of the sample.

Participants for the current study were recruited from this community sample with a multistep procedure. First, the screening sample was divided into four groups based on the combined ratings of parents and teachers for CU traits and conduct problem symptoms. One group was below the sample mean on both dimensions ($n = 225$), one group was at or above the upper quartile on the measure of conduct problems but below the mean on the measure of CU traits ($n = 66$), one 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 one group was above the upper quartile on both dimensions ($n = 128$). Second, each of these four groups was stratified on gender, ethnicity, and SES. Third, a stratified random sampling procedure was used to recruit 25 children in each of the four groups to participate in the current study, with the four groups matching the group from which they were sampled on the stratification variables (see Table 1). Also, the sampling procedure ensured that there were approximately equal numbers of children from the younger and older grade cohorts in each group. Owing to errors in data collection, 2 subjects were lost from the group high on conduct problems but low on CU traits. As a result, the participants were 98 children with an average age of 12.36 years ($SD = 1.73$); in the 2×2 study design, level of CU traits and level of

Table 1
Demographic Characteristics of the Sample

Characteristic	Control ($n = 25$)	Conduct problems only ($n = 23$)	Callous–unemotional (CU) only ($n = 25$)	Combined ($n = 25$)	Effects	Total ($n = 100$)
Mean age (in years)	12.20	12.26	12.68	12.28		12.36
	(1.55)	(1.71)	(2.01)	(1.67)		(1.73)
Mean SES	53.49$_a$	54.53$_a$	42.10$_b$	37.17$_b$	CU[a]	46.67
	(12.38)	(19.95)	(22.46)	(19.10)		(19.96)
Mean K-BIT	109.68$_a$	107.74$_a$	102.72$_{a,b}$	99.40$_b$	CU[b]	104.83
	(11.13)	(11.48)	(14.55)	(12.10)		(12.88)
Cohort (% young)	52	48	52	48		50
Ethnicity (% minority)	8	9	36	32	CU[c]	21
Gender (% female)	68	48	40	36	CU[d]	47
ODD/CD diagnosis (%)	0	65	0	92		39

Note. Numbers in parentheses are standard deviations. Means with different subscripts differ at the $p < .05$ level in pairwise comparisons. SES = Duncan's socioeconomic index (Hauser & Featherman, 1977); K-BIT = Composite Index from the Kaufman Brief Intelligence Test (Kaufman & Kaufman, 1990); ODD/CD diagnoses (ODD = oppositional defiant disorder; CD = conduct disorder) are based on parent and teacher ratings from the Child Symptom Inventory–4 (CSI-4; Gadow & Sprafkin, 1995). Effects are from either 2 × 2 analyses of variance or 2 × 2 logit model analyses. Effects for the presence of a conduct problem diagnosis could not be calculated because there were no diagnoses of it in the control group.
[a] $F(3, 94) = 14.27$, $p < .01$.   [b] $F(3, 94) = 9.30$, $p < .01$.   [c] $\chi^2(1, N = 98) = 8.29$, $p < .01$.   [d] $\chi^2(1, N = 98) = 4.68$, $p < .05$.

conduct problems were the two between-groups factors. The sample had an average Duncan SEI of 46.67 ($SD = 19.96$), was 21% African American, and had an average intelligence score on the Kaufman Brief Intelligence Test (K-BIT; Kaufman & Kaufman, 1990) of 104.83 ($SD = 12.88$).

Measures—Independent Variables

Antisocial Process Screening Device (APSD; Frick & Hare, 2001). The APSD 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 either 0 (*not at all true*), 1 (*sometimes true*), or 2 (*definitely true*). Factor analyses from the large screening sample found three dimensions underlying this rating scale: a 7-item Narcissism dimension, a 5-item Impulsivity dimension, and a 6-item Callous–Unemotional dimension (Frick, Bodin, & Barry, 2000). The CU dimension, which includes items such as "feels bad or guilty," "concerned about the feelings of others," and "does not show emotions," was 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 correlated .38 ($p < .01$), and similar factor structures were evident in the two sets of ratings (Frick, Bodin, & Barry, 2000).

Ratings from parents and teachers were combined by using the higher score from either report for each item (Piacentini, Cohen, & Cohen, 1992). Our use of this method for combining ratings was based on several considerations. First, the report of any single informant, who might not see the child in multiple situations, would be limited, and therefore the use of individual-informant ratings would not provide the most accurate assessment of these traits. Second, there can be substantial motivation for persons to underreport a child's level of the traits assessed by the APSD, which are generally not socially desirable, but motivation for overreporting of such behaviors appears less likely. Therefore, considering a trait as present only when multiple informants report it as present does not seem justifiable. Third, a child who is scored high by multiple raters may not be more extreme on these traits than a child who is scored high by only one rater. It may simply be that the situation in which one rater sees the child is not as likely to elicit these traits as another situation, or it may be that the child is able to mask such behaviors in certain situations. As a result, a simple

summative or averaging approach to combining information across informants is not justifiable.

Child Symptom Inventory–4 (CSI-4; Gadow & Sprafkin, 1995). The CSI-4 is a standardized behavior rating scale designed to assess over a dozen childhood disorders that are based on *DSM–IV* criteria. Only the items assessing the symptoms of ODD and CD were included in this study. Parents and teachers rated each symptom on a scale from 0 (*never*) to 3 (*very often*), and consistent with the procedure used to combine informants on the APSD and based on a similar rationale, a multi-informant composite was formed by using the highest rating for each symptom. The parent and teacher correlations in the community sample were .29 ($p < .01$) for the CD symptoms and .35 ($p < .01$) 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 ($n = 63$), with sensitivity rates for predicting the diagnoses of ODD and CD of .93 for both diagnoses and specificity rates of .61 and .70, respectively.

Measures—Dependent Variables

Thrill and adventure seeking. The Thrill and Adventure Seeking (TAS) subscale of the Sensation Seeking Scale for Children (SSS-C; Russo et al., 1993) was used to measure participants' preferences for novel and dangerous activities. The scale was modified for use in this study. As in the original version of the scale, the participant chose between a pair of statements to indicate which one was more true of him or her. One statement (e.g., "I enjoy the feeling of riding my bike fast down a big hill") described sensation seeking behaviors, whereas the other statement described a preference for avoiding sensation seeking behaviors (e.g., "Riding my bike fast down a hill is scary for me"). However, to increase the variance in scores, the modified version also asked each child to rate how well the chosen behavior described him or her by selecting either *sort of true for me* or *really true for me*. This modification created a 4-point scale for each item. The modified version of the SSS-C led to an internally consistent TAS subscale ($\alpha = .84$). Although the full SSS-C was administered, only the TAS scale was used in the analyses because its content specifically assesses fearlessness, the aspect of sensation seeking most specifically linked to low behavioral inhibition as conceptualized in past

research (Kagan & Snidman, 1991), and because it is the scale from the SSS-C that has been most strongly and consistently related to CU traits in past research (Frick et al., 1994, 1999).

Reward dominance computer task (O'Brien & Frick, 1996). Participants' sensitivity to punishment cues once a reward-oriented response set was established was assessed using a paradigm employed in previous research with adults (e.g., Newman, Patterson, & Kosson, 1987) and children (Daugherty & Quay, 1991). A more complete description of the specific computer task can be found elsewhere (O'Brien & Frick, 1996; O'Brien, Frick, & Lyman, 1994). The task consisted of four games, and participants were allowed to earn prizes based on their scores across all four games. In each game, a stimulus (e.g., a fisherman) appeared on the screen, and the child chose whether or not to press a key to view the other side of the stimulus (e.g., a reel in a fishing pole) or to press a key to stop the game. For each game, there was a successful outcome (e.g., a fish) or an unsuccessful outcome (e.g., no fish) on the other side of the stimulus. Each child began with 50 points, and a point was either added or taken away depending on the outcome of each trial. The proportion of successful outcomes across each successive 10 trials decreased from 90% to 0% over 100 trials. The total number of trials played was recorded and was used as a dependent variable in the analyses because this number serves as an index of continued playing despite an increased ratio of punished trials (loss of point) to rewarded trials (gain of point). Across the four games, a forced 5-s pause between each trial and the presence of a visual tally of the number of points won were varied in a counterbalanced fashion. As in some previous studies, the forced pause appeared to interrupt the reward dominant response set (Newman et al., 1987; O'Brien et al., 1994). Therefore, only the two conditions in which there was no forced pause prior to a participant's being allowed to play the next trial were used in the analyses. As in previous uses of this computer task (O'Brien & Frick, 1996; O'Brien et al., 1994), no effects for order or for order by condition interactions were found on the task.

Emotional lexical decision task (Williamson, Harpur, & Hare, 1991). A lexical decision task originally developed by Williamson et al. (1991) for use with adult samples and modified by Loney et al. (in press) for use with younger samples was used as a measure of reactivity to negative stimuli. The task involves a computerized administration of a series of letter strings, some of which form words and some of which do not. The letter strings include emotionally laden and neutral words as well as nonwords. Nonwords were formed by altering one letter of each real word contained in the task (e.g., *bomb*–*bemb*). The emotionality of the words was derived from Toglia and Battig's (1978) word norms and included both positive and negative emotional words. Frequency of usage data were derived from Kucera and Francis (1967). The length, number of syllables, imagery, concreteness, and frequency of usage of the words were balanced across word types. The Williamson et al. (1991) task was modified for use with child and adolescent samples by using only words composed of 4 or fewer letters that had a concreteness rating of 2.75 or greater, such as *glad* (positive), *bomb* (negative), and *boot* (neutral).

Participants were seated at a computer and were instructed to depress either a yes ("V") key if the letters on the screen spelled a real word or to depress the no ("N") key if the letter strings did not form a real word. Participants were instructed to make a decision "as quickly as possible while still being accurate." Speed of recognition was recorded by the computer in milliseconds. Typically, individuals recognize emotional words faster because of an automatic allocation of attentional resources to emotional material (Rusting, 1998). An index of this preattentive level of emotional reactivity is derived by creating a difference score between a child's mean reaction time to emotional words and his or her mean reaction time to neutral words; this difference score thus provides a measure of the response time facilitation to emotional stimuli.

Because the construct of behavioral inhibition predicts deficits in responsivity only to aversive or punishment cues and because previous uses of this task have shown that CU traits are associated with deficits in

reactivity only to negative words (Loney et al., in press), only the response time facilitation to negative words was predicted to be associated with CU traits. However, analyses of response time facilitation to positive words were included to directly test this hypothesized specificity in the emotional deficit. Also, response times were not included in analyses if (a) they deviated more than 2.5 *SD* from an individual participant's overall mean response time for the task (to ensure that a few outlier data points did not have a disproportionate influence on participants' scores) or (b) they corresponded to an incorrectly identified word stimulus. In addition, very deviant overall facilitation scores (i.e., those greater than 150 ms or less than −150 ms) were excluded from analyses to further minimize the influence of outlier data on response time findings. Finally, in order to ensure an acceptable level of word knowledge, participants with less than a 70% accuracy rate were excluded from the analyses. These exclusionary criteria led to a reduced sample of 84 participants for these analyses.

Behavioral Assessment System for Children (BASC; Reynolds & Kamphaus, 1992). The BASC is a behavior rating scale system that covers a broad range of both adaptive and maladaptive child behavior. It has been standardized on a large nationwide sample of children and adolescents, and each of the scales has produced reliable scores according to several indices of reliability (e.g., internal consistency and test–retest; Kamphaus & Frick, 1996). Each parent and child completed the appropriate form of the BASC. On the parent version (BASC–PRS), *T* scores on the Hyperactivity subscale and the Anxiety subscale were included in analyses. The child version (BASC–SRP) does not include items assessing behavioral problems, and therefore only the Anxiety subscale was included from the self-report version.

Diagnostic Interview Schedule for Children—Version 4 (Shaffer & Fisher, 1996). The Disruptive Behavior Disorders (DBD) and Anxiety Disorders modules of the most recent revision of the National Institute of Mental Health's Diagnostic Interview Schedule for Children (DISC–4; Shaffer & Fisher, 1996) were administered to each child and parent. The DISC–4 is a highly structured interview designed to be administered by lay interviewers with appropriate training. The DBD module contains questions necessary to assess for all symptoms in *DSM–IV* criteria for attention-deficit/hyperactivity disorder (ADHD), ODD, and CD, and the Anxiety Disorders module contains questions necessary to assess for generalized anxiety disorder, separation anxiety disorder, social phobia, and simple phobia. Previous versions of the DISC have proven to be highly reliable on both the symptom and diagnostic level for children within the age groups included in this study (Lahey et al., 1994).

Interviewers were either a licensed psychologist or 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. Two indices were derived from both the parent and child interviews. The number of impulsivity–hyperactivity symptoms from the ADHD criteria were summed, as were the number of anxiety symptoms across all five anxiety disorders assessed by the DISC–4. The correlations between parent reports of impulsivity–hyperactivity symptoms on the DISC–4 and of analogous behaviors on the BASC Hyperactivity scale ($r = .83$, $p < .01$) and between parent reports of anxiety symptoms on the DISC–4 and on the BASC Anxiety subscale ($r = .62$, $p < .01$) indicated substantial consistency in parent reports across these two methods of assessment. The correlation between children's reports of anxiety symptoms on the DISC–4 and their reports on the BASC Anxiety subscale indicated somewhat less consistency ($r = .47$, $p < .01$).

Why Kids Do Things? (Crick, 1995). This instrument is a hypothetical situation procedure used to assess tendencies to attribute hostile intent and to react angrily in social situations involving peer provocation. The instrument consists of 10 stories, each of which describes a provocation situation in which the intent of the provocateur is ambiguous. Five of the stories depict instrumental provocation (e.g., a peer breaks the subject's new radio while the subject is out of the room), and five of the stories depict relational provocation (e.g., the subject overhears two peers talking about an upcom-

ing birthday party to which she or he has not been invited). Participants answer several questions for each story, each of which assesses their attributions of the provocateur's intent. For the first question, children were asked to circle one of four presented reasons for the provocation, two of which reflected hostile intent (e.g., "the child didn't want me to come to the party") and two of which reflected benign intent (e.g., "the child hasn't had a chance to invite me yet"). For the second question, children were asked to tell whether the provocateur's behavior was intended to be mean (i.e., hostile intent) or not mean (i.e., benign intent). Across the 10 stories, the number of hostile attributions made by the child was summed. The internal consistencies for the relational and instrumental provocation stories were .81 and .78, respectively. Also, after each story, participants were asked to rate on a 3-point scale (*not mad at all*, *a little mad*, and *very mad*) how mad they would be if "the things in the story really happened." These ratings were summed, which led to two indices of angry reactivity that had internal consistency estimates of .74 and .66 for the relational and instrumental provocation vignettes, respectively.

Procedure

Using the stratified random sampling procedure described previously, we contacted parents who participated in the community-wide screening and invited them to participate in the study. Those who refused 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 owing to errors in data collection, and both came from the high-conduct-problems/low-CU-traits cell of the design. Participants were then 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 the child together. They were then separated, and parents were administered a semistructured interview to obtain demographic information, followed by the DISC–4 interview. Following the DISC–4 interview, the parents completed all of the behavior rating scale measures. In a separate room, the children were administered the K-BIT as an intellectual screening, the DISC–4 interview, and the Why Kids Do Things? vignette procedure. During the second testing session, the children were first administered the emotional lexical decision task, followed by the self-report rating scales. The computerized reward dominance task for which participants won prizes was administered last. Parents were provided with a $65.00 check, and children were given a $15.00 gift certificate to a music store or bookstore for their participation.

Results

The demographic characteristics of the sample and each cell of the 2 × 2 study design are described in Table 1. There were main effects for CU traits on SES, intelligence, ethnicity, and gender. Children high on CU traits were lower in SES, lower in intelligence, more likely to be minority, and more likely to be male than were other children in the sample. Because of these associations, demographic characteristics were used as covariates in all subsequent analyses. To estimate the severity of conduct problems experienced by the two conduct problem groups, we also report in Table 1 the percentage of children who met *DSM–IV* criteria, which were based on the number of symptoms rated as being exhibited *often* or *very often* on the CSI-4 by either parent or teacher. According to these research criteria, 65% of the children with conduct problems who were low on CU traits and 92% of the children with conduct problems who were high on CU traits passed a diagnostic threshold. Also, the sampling procedure was designed to ensure that children from both grade cohorts (third/fourth and sixth/seventh) were approximately equally represented in each cell. To test for any differences in findings for the two cohorts, we included cohort as a third factor in all analyses.

Table 2 provides the distribution of the main study variables and the correlations between these variables and demographic characteristics. There were several significant associations with demographic variables, but few were consistent across all measures within a construct. One notable exception was the measure of

Table 2
Distribution of Main Study Variables and Correlations With Demographic Characteristics

Variable	M	SD	Range	Age	SES	Ethnicity	Gender	K-BIT
Emotional dysregulation: anxiety								
DSM–IV anxiety, parent	8.08	6.25	1–27	−.28**	−.15	.02	.10	−.18
DSM–IV anxiety, youth	11.73	6.78	0–29	−.28**	−.25*	.13	.10	−.03
BASC–PRS anxiety	50.03	11.14	29–90	−.10	.08	−.23**	.18	−.03
BASC–SRP anxiety	44.17	7.57	34–64	.07	−.02	.19*	.08	−.24**
Emotional dysregulation: impulsivity–hyperactivity (I-H)								
DSM–IV I-H, parent	1.83	2.53	0–9	−.25**	−.04	−.16	−.13	.06
DSM–IV I-H, youth	.85	1.66	0–9	.03	−.10	−.05	−.16	.05
BASC–PRS hyperactivity	50.04	14.65	30–99	.00	−.04	−.18	−.10	−.10
Behavioral inhibition								
SSS-C thrill seeking	32.38	8.12	15–48	.07	.07	−.23*	−.29**	.35**
Reward dominance task	119.55	46.16	6–190	−.06	−.12	.23*	.14	−.15
Facilitation index	−.06	62.42	−143–136	.10	.05	−.03	−.27	.09
Emotional reactivity to provocation								
Hostile attributions, relational	4.41	2.52	0–10	−.15	−.13	.16	.02	−.21*
Hostile attributions, instrumental	2.13	2.34	0–9	−.03	−.19*	.18	−.04	−.43**
Angry reactivity, relational	3.83	2.56	0–10	−.29**	−.23*	−.04	−.08	−.11
Angry reactivity, instrumental	6.53	2.15	1–10	−.04	−.26**	.14	−.20*	−.21*

Note. SES = Duncan's socioeconomic index (Hauser & Featherman, 1977); *DSM–IV* = 4th edition of *Diagnostic and Statistical Manual of Mental Disorders*; K-BIT = Composite Index from the Kaufman Brief Intelligence Test (Kaufman & Kaufman, 1990); BASC–PRS=Behavioral Assessment System for Children—Parent Report Form (Reynolds & Kamphaus, 1992); BASC–SRP = Behavioral Assessment System for Children—Self-Report of Personality (Reynolds & Kamphaus, 1992). Ethnicity was coded 1 = White and 2 = African American; gender was coded 1 = boys and 2 = girls.
* $p < .05$. ** $p < .01$.

emotional reactivity to peer provocation, which tended to show negative correlations with age, SES, and intelligence. These correlations indicated that older children, children with higher SES, and children of higher intelligence tended to show lower numbers of hostile attributions and less angry reactivity on this task. It is important to note that this is the one construct from which all indicators came from a single task.

Emotional Dysregulation

The primary analytical framework used to test the study hypotheses consisted of a series of $2 \times 2 \times 2$ multivariate analyses of covariance (MANCOVAs) to test for the predicted main effects of conduct problems and CU traits and their interaction on the main study variables; these analyses grouped the dependent variables according to the construct for which they were selected to assess. The results of these analyses are summarized in Table 3. To test for the predicted main effects of conduct problems on measures of emotional and behavioral dysregulation, we conducted separate MANCOVAs for the measures of anxiety and the measures of impulsivity–hyperactivity, although similar predictions were made for both constructs. The $2 \times 2 \times 2$ MANCOVA, with the four measures of anxiety as the dependent variables (parent and child reports of anxiety disorder symptoms and parent and child ratings

Table 3

Results of $2 \times 2 \times 2$ Multivariate Analyses of Covariance

Variable	Low CU/Low CP		High CU/Low CP		Low CU/Hi CP		Hi CU/Hi CP	
	M	SD	M	SD	M	SD	M	SD
Emotional and behavioral dysregulation								
Anxiety/emotional distress								
DSM–IV anxiety symptoms, parent	5.95$_a$	4.06	6.45$_{a,b}$	5.50	9.64$_{b,c}$	6.40	10.40$_c$	7.38
BASC–PRS anxiety	45.26$_a$	7.12	46.13$_a$	10.14	53.13$_b$	11.94	55.64$_b$	11.67
DSM–IV anxiety symptoms, youth	10.51$_a$	5.38	12.34$_a$	7.31	10.15$_a$	7.21	13.86$_a$	6.62
BASC–SRP anxiety	42.01$_a$	7.05	44.38$_a$	6.80	41.86$_a$	7.03	48.04$_b$	8.15
Significant overall effects: CP, $F(4, 83) = 4.98**$								
Cohort, $F(4, 83) = 5.14**$								
Impulsivity–hyperactivity								
DSM–IV impulsivity–hyperactivity, parent	0.75$_a$	1.48	1.45$_a$	2.35	2.05$_{a,b}$	2.51	3.02$_b$	3.11
BASC–PRS hyperactivity	39.94$_a$	7.99	48.35$_b$	12.69	49.66$_b$	13.58	62.01$_c$	16.01
DSM–IV impulsivity–hyperactivity, youth	0.44$_{a,b}$	.92	1.23$_{b,c}$	2.29	0.12$_a$	0.52	1.57$_c$	1.96
Significant overall effects: CU, $F(3, 84) = 8.88**$								
CP, $F(3, 84) = 8.09**$								
Cohort, $F(3, 84) = 7.35**$								
CP $\times$ Cohort, $F(3, 84) = 2.60*$								
Behavioral inhibition								
SSS-C thrill seeking	32.53$_a$	9.88	34.97$_a$	7.78	28.57$_b$	5.58	33.12$_a$	8.24
Reward dominance	105.31$_a$	43.52	131.07$_a$	45.33	116.43$_a$	53.60	125.41$_a$	39.53
Significant overall effects: CU, $F(2, 85) = 4.24*$								
Reactivity to interpersonal provocation								
Hostile attributional biases								
Hostile attributions, relational	4.92$_a$	2.61	3.98$_a$	2.53	4.64$_a$	2.49	4.06$_a$	2.60
Hostile attributions, instrumental	2.83$_a$	2.29	1.53$_b$	2.29	2.66$_{a,b}$	2.36	1.54$_b$	2.52
Significant overall effects: CU, $F(2, 85) = 2.98*$								
Angry reactivity								
Angry reactions, relational	3.95$_a$	2.45	3.39$_a$	2.27	4.23$_a$	2.68	3.75$_a$	2.87
Angry reactions, instrumental	7.03$_a$	2.48	6.88$_a$	1.90	6.15$_a$	2.17	6.10$_a$	2.20
Significant overall effects: Cohort, $F(2, 85) = 11.39**$								

Note. Effects are based on a $2 \times 2 \times 2$ multivariate analysis of covariance with high/low scores on the Callous–Unemotional (CU) scale of the Antisocial Process Screening Device, high/low levels of conduct problems (CP), and younger/older cohort as the factors. All analyses used Duncan's socioeconomic index (Hauser & Featherman, 1977), the Composite Index from the Kaufman Brief Intelligence Test (Kaufman & Kaufman, 1990), gender, and ethnicity (minority/nonminority status) as covariates. Means reported in the table are least-squared means adjusted for the covariates. Means with different subscripts differ at the $p < .05$ level in pairwise comparisons. *DSM–IV* = 4th edition of the *Diagnostic and Statistical Manual of Mental Disorders*; BASC–PRS = Behavioral Assessment System for Children—Parent Report Form; BASC–SRP = Behavioral Assessment System for Children—Self-Report of Personality; SSS-C = Sensation Seeking Scale for Children.
* $p < .05$. ** $p < .01$.

on the BASC Anxiety subscale), revealed the predicted main effects for conduct problems, $F(4, 83) = 4.98$, $p < .01$, and no interaction between conduct problems and CU traits. Inspection of the mean level of anxiety revealed that children high on conduct problems had higher rates of anxiety irrespective of their level of CU traits or grade cohort, although this was most evident for parental report. An effect did emerge for grade cohort, $F(4, 83) = 5.14$, $p < .01$, because younger children tended to report more anxiety symptoms than older children.

Also reported in Table 3 are the results of the $2 \times 2 \times 2$ MANCOVA for the three measures of impulsivity–hyperactivity, which included parent and child reports of the impulsivity–hyperactivity symptoms for ADHD and the BASC–PRS Hyperactivity subscale. As predicted, there was a main effect for conduct problems, $F(3, 84) = 8.09$, $p < .01$, on these measures, with children high on conduct problems showing higher levels of impulsivity–hyperactivity. This was most consistently true for the children high on both conduct problems and CU traits. Also as predicted, there was no significant interaction between conduct problems and CU traits, which suggests that the relation between impulsivity–hyperactivity and conduct problems was not moderated by the presence of CU traits. There were also main effects for CU traits, $F(3, 84) = 8.88$, $p < .01$, and grade cohort, $F(3, 84) = 7.35$, $p < .01$. The effect for cohort was clear, with the younger cohort showing higher levels of impulsivity–hyperactivity than the older cohort on each measure. The effect for CU traits was less clear and consistent across measures. However, it was primarily due to the fact that on most measures of impulsivity–hyperactivity, the group high on both CU traits and conduct problems typically showed the highest level of these behaviors compared with any other group. This pattern of findings suggests that this group had the most severe difficulties in behavioral regulation.

Behavioral Inhibition

The next set of analyses tested the associations among CU traits, conduct problems, and the indices of behavioral inhibition. First, a $2 \times 2 \times 2$ MANCOVA was conducted with scores on the Thrill and Adventure Seeking subscale of the SSS-C and number of trials played on the reward dominance task used as the dependent measures. As predicted, these analyses resulted in a significant main effect for CU traits, $F(2, 85) = 4.24$, $p < .05$, with children high on CU traits showing higher thrill seeking scores ($M = 34.00$, $SD = 8.04$) and playing more trials on the reward dominance computer task ($M = 145.76$, $SD = 33.69$) than children low on CU traits (for thrill seeking, $M = 30.68$, $SD = 8.05$; for reward dominance, $M = 133.04$, $SD = 41.01$) after covariates were controlled. Also as predicted, there was no significant interaction between CU traits and conduct problems in these analyses, which suggests that the presence of conduct problems did not moderate the association between CU traits and these indices of behavioral inhibition.

Although the response facilitation indices to emotional words from the lexical decision task were conceptualized as a third indicator of behavioral inhibition, the results from this task were analyzed separately because of the need to eliminate several participants from this analysis owing to the exclusionary criteria for this task. These criteria led to a sample size of 84 for this analysis,

with the excluded participants being fairly equally distributed across conditions (ns ranging from 19 for the high-CU-traits/low-conduct-problems cell to 22 for the control cell and the low-CU-traits/high-conduct-problems cell). The $2 \times 2 \times 2$ ANCOVA using the response time facilitation index to positive words revealed no significant main effects or interactions, as predicted. However, analyses using the index for negative emotional words as the dependent variable revealed a significant interaction between CU traits and grade cohort, $F(1, 72) = 4.30$, $p < .05$. As predicted, children high on CU traits did not show a response time facilitation to negative emotional words, which suggests that these words did not evoke a preattentive orienting response in children high on these traits. In fact, children high on CU traits tended to show slower recognition times to the negative words than to neutral words. However, unlike the other measures of behavioral inhibition, this effect was found only for the younger grade cohort. Specifically, after controlling for the demographic covariates, we found that young children without CU traits showed faster reaction times to negative than to neutral words ($M = 6.60$ ms, $SD = 66.58$), whereas the young children with CU traits showed an opposite pattern of slower reaction times to negative words ($M = -34.21$ ms, $SD = 65.66$). In contrast, older children low on CU traits ($M = 1.68$ ms, $SD = 56.21$) and older children high on CU traits ($M = 17.94$ ms, $SD = 54.29$) both showed faster reaction times to negative words than to emotionally neutral words.

Emotional Reactivity to Provocation

The next set of analyses used hostile attributions and angry reactivity to hypothetical social situations involving provocation as the dependent variables. The first MANCOVA used the two indices of hostile attributions, one summing the attributions to situations involving instrumental aggression and a second summing the attributions to situations involving relational aggression, as the dependent measures. Contrary to predictions, there was no interaction between CU traits and conduct problems in predicting these dependent measures. The only significant finding was an unexpected main effect for CU traits, $F(2, 85) = 2.98$, $p < .05$, with children high on CU traits making fewer hostile attributions than children low on these traits. A second MANCOVA used the two indices of angry reactivity to the hypothetical vignettes as dependent variables. Again, the results were not consistent with predictions. There was no interaction between CU traits and conduct problems. In fact, the only significant effect in this analysis was a significant cohort effect, $F(2, 87) = 11.65$, $p < .01$, with younger children reporting higher levels of angry reactivity to the hypothetical social situations.

Summary of Results

Figure 1 provides a graphical summary of the main study results and illustrates the potential implications of these results for the various subgroups of children in the study. One measure from each of the constructs analyzed in the MANCOVA analyses was chosen to illustrate the effects found in these analyses, and these variables were all standardized by first converting them to z scores, thereby equating for different units of measurement. It is important to note that whereas a z score of 0 represents a score at the mean of this study's sample, this should not be equated with a normative mean,
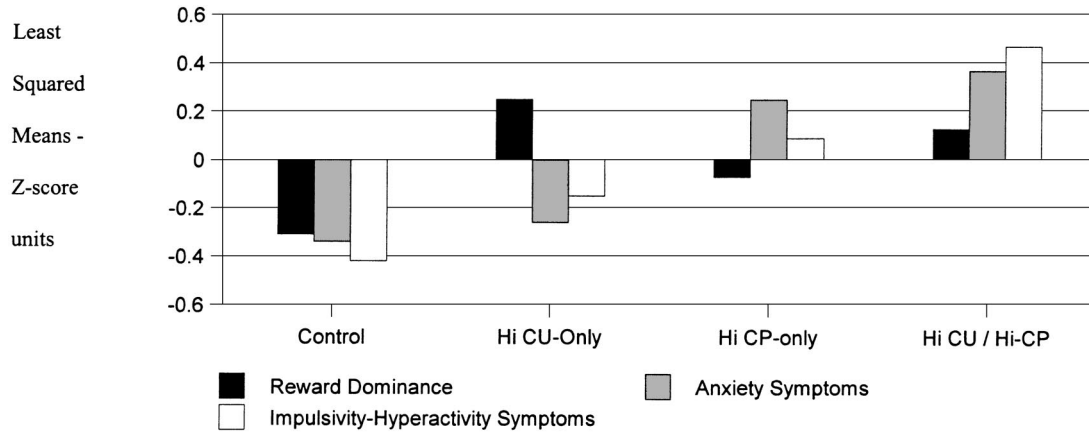
Figure 1. Graphic illustration of multivariate analysis of covariance results. Hi CU = high callous–unemotional traits; Hi CP = high conduct problems.

because this study oversampled children with CU traits and conduct problems. Because the analyses assessing hostile attributional biases and emotional reactivity to provocation in social situations did not reveal the expected results, these variables were not included in Figure 1.

It is evident from the figure that both groups of children with conduct problems showed high scores on measures of emotional and behavioral dysregulation (i.e., measures of anxiety and impulsivity–hyperactivity). Furthermore, the combined group appeared to be the most severely dysregulated group, especially on measures of impulsivity–hyperactivity. In contrast, only children with both conduct problems and CU traits showed low behavioral inhibition, represented in the figure by the number of trials played on the reward dominance computer task. In addition, low behavioral inhibition was associated with CU traits in general, because the group with these traits who were low on conduct problems also showed a reward dominant response style on this task. This group of children without conduct problems did not, however, show signs of emotional and behavioral dysregulation.

Post Hoc Analyses of Potential Moderating Effects of Gender, SES, and Intelligence

As noted in Table 1, the sampling procedure used for this study led to differences across the conditions for several demographic variables. We controlled for the linear effects of these variables in all of the multivariate analyses to ensure that the obtained associations could not be attributed solely to these group differences. However, these analyses would not detect potential interactions in which the pattern of findings was moderated by these demographic variables. To test for these potential interactions, we conducted a series of $2 \times 2 \times 2$ MANCOVAs collapsing across cohort and using age as a covariate but adding each demographic variable as the third factor with CU traits and conduct problems. The one exception to this general procedure for post hoc analyses was in the analyses using the results of the lexical decision task, which were conducted both with and without grade cohort as a factor given its interaction with CU traits in the main analyses.

The results of these analyses should be interpreted cautiously for several reasons. First, the sample was not collected specifically to address these questions, and therefore using the demographic variables as a factor in the design led to somewhat small cell sizes. Second, we did not make a priori predictions concerning the moderating effects of these variables, and therefore they should be considered post hoc findings. Third, we limited the analyses of the key study hypotheses to six MANCOVAs and one ANCOVA, thereby maintaining an acceptable level of control over the experimentwise rate for Type I errors. In contrast, these post hoc analyses added greatly to the chance of Type I errors.

In the first series of analyses, we included gender as a factor, and there was little evidence that gender moderated our findings significantly. There was one notable exception. That is, the failure to find the expected interaction between CU traits and conduct problems for the number of hostile attributions made to the vignettes describing peer provocation seemed to be due to the results for girls. That is, the overall MANCOVA using the number of hostile attributions to vignettes involving peer provocation as the dependent variable showed a three-way interaction among conduct problems, CU traits, and gender that approached significance in the overall analyses, $F(2, 85) = 2.65$, $p < .07$, and reached significance in the ANCOVA using attributions involving relational provocations, $F(1, 86) = 4.92$, $p < .05$. This interaction is displayed in Figure 2. It illustrates that the expected pattern of findings, in which the group high on conduct problems and low on CU traits ($n = 12$) showed a higher level of hostile attributions to the provocation stories than the other three groups ($n = 8$, $n = 15$, and $n = 16$), emerged for boys. In contrast, there was very little variation in the mean level of hostile attributions for girls across the four cells of the design, although the highest level of hostile attributions was found in the low-CU-traits/low-conduct-problems cell for girls.

When a median split on SES was entered into the analyses as a third factor, there was little evidence for a moderational effect of this variable in the prediction of any of the dependent variables. Similarly, there was little evidence for moderational effects when a median split on intellectual level was used as a third factor. The one exception was for the level of angry reactivity to peer provocation in the hypothetical vignettes. In the overall MANCOVA, there was a CU $\times$ Intelligence interaction, $F(2, 85) = 3.13$, $p <$
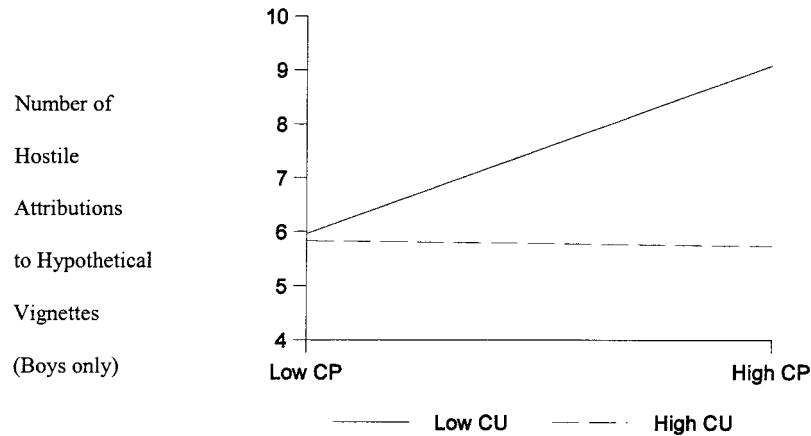
Figure 2. Hostile attributional biases: Associations with callous–unemotional (CU) traits and conduct problems (CP) for boys only.

.05, and a three-way interaction that approached significance for the relational aggression provocations, $F(1, 86) = 3.27$, $p < .07$. For children above the median on intelligence test scores, the findings were consistent with theoretical predictions, and these results are presented in Figure 3. Specifically, children low on CU traits but high on conduct problems ($n = 14$) showed the highest level of angry reactivity, whereas children high on CU traits and high on conduct problems ($n = 7$) showed the lowest level of angry reactivity. In contrast, there was very little variation in the two groups of children low on conduct problems ($n = 20$ and $n = 14$). Further, this effect was not found for children below the median on the IQ measures, for whom there was little variation across the four groups.

The one demographic variable that could not be investigated in this way was ethnicity, given the few minority participants in the two groups who were low on CU traits ($n = 2$ in both groups). Two analyses were conducted to provide at least some information on the potential effects of the racial composition of the sample on the results. First, the analyses were conducted with African American children eliminated from all groups, and the results from the

main analyses were basically unchanged. Second, the two groups high on CU traits were broken down by ethnicity, and the resulting two ethnic groups were compared on the measures of behavioral inhibition, the measures that showed the main effect of CU traits in the overall analyses. There were no significant differences in these analyses between the children of different ethnicities. Therefore, although these analyses cannot conclusively rule out the potential moderating effects of ethnicity, they suggest that racial differences in the groups are not likely to be the sole reason for the main effects of CU traits in the analyses reported in Table 3.

Discussion

These results from a nonreferred sample of children extend the results of previous research that used clinic-referred and forensic samples (see Frick, 1998a, and Frick, Barry, & Bodin, 2000, for reviews) and suggest that CU traits may help to designate distinct developmental pathways to the development of severe antisocial and aggressive behavior. Our findings indicate that children with conduct problems, irrespective of the presence of CU traits, show
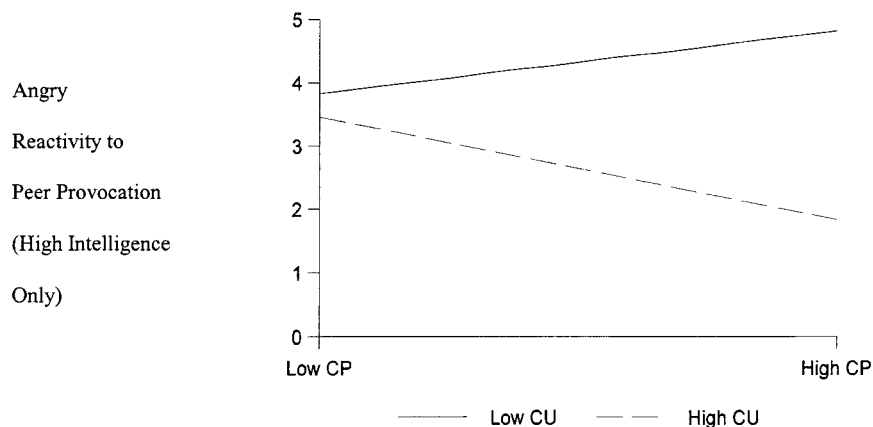

Figure 3. Angry reactivity: Associations with callous–unemotional (CU) traits and conduct problems (CP) for those above the median of intelligence only.

evidence of emotional and behavioral dysregulation. The results also suggest that the group high on both conduct problems and CU traits evidenced the greatest level of dysregulation, especially on measures of impulsivity–hyperactivity, which we interpreted as a measure of behavioral dysregulation. These results are consistent with past research showing that this group of conduct problem children tends to show a more severe and impairing pattern of problem behavior (Christian et al., 1997) that places them at risk for severe aggression and violence in adolescence (Caputo et al., 1999).

More important for the focus of the current study is the evidence supporting our contention that different developmental processes may underlie the emotional and behavioral dysregulation of the two conduct problem groups. Specifically, children with CU traits and conduct problems showed evidence of a lack of behavioral inhibition, such as a preference for novel and dangerous activities and a decreased sensitivity to cues to punishment once a reward-oriented response set was formed, a finding that is also consistent with results from past research with clinic-referred children (Fisher & Blair, 1998; Frick et al., 1999; O'Brien & Frick, 1996). In addition, the present study is the first to show that children with CU traits, even if they do not show severe conduct problems, also exhibit some characteristics associated with behavioral inhibition, especially the reward dominant response style. This latter finding is important because it suggests that the link between CU traits and low behavioral inhibition does not appear to be unique to a group of severely antisocial children, and as a result, it makes a link to the literature on the normal development of guilt and empathy more tenable (see Blair et al., 1997; Kochanska, 1993, 1995). This finding also raises the important question of what factors may lead a child who is low in behavioral inhibition, and possibly lacking in the affective components of conscience, to develop adequate behavioral regulation and avoid significant antisocial and aggressive behavior problems. Such protective factors could be integrated into interventions designed to prevent the development of severe conduct problems in children low in behavioral inhibition.

One finding that was not completely consistent with this predicted association involved the assessment of emotional reactivity to negative words, measured as a child's response time facilitation to the recognition of negative emotional words, compared with emotionally neutral words, on a lexical decision task. The predicted association between low emotional reactivity and CU traits was found only for young children. There are several possible reasons for this inconsistent finding. One possible explanation is that the findings on the reward dominance task may not be due to a deficit in behavioral inhibition, as we had hypothesized, but may be related to a cognitive deficit in which children with CU traits have difficulty altering a goal-oriented response set once this response set has been primed (Newman, 1998). As a result, one would not expect deficits on tasks measuring emotional processing that do not establish a motivation set that must be changed in response to the processing of contextual cues, as in the reward dominance task. Although this explanation has some theoretical appeal, it does not explain why the hypothesized deficit was present in the younger sample. Another possible explanation for this pattern of results is that older children with conduct problems may be more heterogeneous in terms of the developmental processes underlying their conduct problems because an older group of children is more likely to contain some who may show an

adolescent onset to their conduct problems and therefore be distinct from youth who show a childhood-onset pattern (Moffitt, 1993; Silverthorn & Frick, 1999). However, this explanation does not explain why this finding was specific to one measure of behavioral inhibition.

Despite some inconsistency across measures, the results do generally support our contention that there may be different processes underlying the emotional and behavior dysregulation of different subgroups of children with conduct problems. It has been theorized that impulsive and dysregulated behavior can come about through problems in many different regulatory processes. For example, such behavior can be due to a lack of inhibitory drives to aversive stimuli, leading to behavior that is insensitive to cues of danger and punishment, or to an overactive appetitive system, leading to behavior that is overly sensitive to potential rewards (Fowles, 1987; Gray, 1982), both of which are viewed as being part of a temperament labeled as low behavioral inhibition (Kagan & Snidman, 1991). Alternatively, it may be that some impulsivity is due to overreactivity to emotional stimuli, leading to lack of forethought and planning in the context of high emotional arousal (Loney et al., in press; Stanford & Barratt, 1992). Our results are consistent with the contention that the problems of emotional dysregulation exhibited by children with conduct problems who are also high on CU traits are more likely to be related to the former rather than the latter processes involving behavioral inhibition.

This possibility is also consistent with findings from research on antisocial and criminal adults, where the concept of psychopathy has been used to designate a distinct group of antisocial individuals. Consistent with the findings reported here and elsewhere with clinic and forensic samples of children (Frick 1998a; Frick, Barry, & Bodin, 2000), research on psychopathic adults has found that these individuals, who show a callous and unemotional interpersonal style, share with other antisocial individuals high rates of impulsive and dysregulated behavior. However, they are unique in showing a number of deficits in the way they process emotional stimuli that support the contention that they lack fearful inhibitions (Hart & Hare, 1997; Lilienfeld, 1994; Lykken, 1995; Patrick, 1994). Given the pejorative connotations associated with the term *psychopath*, one must be cautious in applying it to children without a great deal more research testing whether antisocial children who also exhibit CU traits show a developmental analogue to this construct as it has been conceptualized in adults. However, our findings, like those with adults, suggest that it is not simply the combination of emotional and behavioral dysregulation, combined with serious conduct problems, that designates children who show a pattern of affective and behavioral characteristics similar to those of adults with psychopathy (Lynam, 1996, 1998). Instead, it appears that it is the presence of CU traits that designates a distinct group of behaviorally dysregulated children with conduct problems who may have unique processes underlying their dysregulation that make them more similar to adults with psychopathy (see also Barry et al., 2000).

One important but confusing conceptual issue that results from the present findings, and from past studies using clinic-referred (Frick et al., 1999) and forensic (Frick, Lilienfeld, Edens, Poythress, & McBurnett, 2000) samples, is that children high on CU traits and conduct problems show high levels of trait anxiety but low levels of behavioral inhibition, one characteristic of which is

fearlessness. These seemingly difficult to reconcile findings can be explained by two factors. First, fearful inhibitions and trait anxiety are conceptually distinct constructs (see Frick et al., 1999, for a more extended discussion). Specifically, fearfulness is typically conceptualized as a sensitivity to cues of impending danger and is a trait specifically linked to behavioral inhibition (Gray, 1982; Kagan & Snidman, 1991), whereas trait anxiety is typically conceptualized as distress resulting from the perception that impending danger and negative consequences are inevitable, and such anxiety can be the consequence of chronic exposure to multiple stressful events. In support of this distinction is the fact that measures of fear and anxiety tend to be only minimally correlated, and they are separable in factor analyses, with trait anxiety associated with other indicators of negative affectivity and fear associated with the personality dimension of constraint (Tellegen & Waller, 1994). In addition, the two constructs appear to have different physiological correlates (Dien, 1999; Rosen & Schulkin, 1998). Therefore, it is plausible that children with CU traits could show fearlessness associated with behavioral inhibition but still show emotional distress because of the impairments caused by their behavioral problems. Second, although children with conduct problems who exhibit CU traits have been shown to display high levels of anxiety and emotional distress in this and other samples (Frick et al., 1999; Frick, Lilienfeld, et al., 2000), this finding appears to be secondary to the fact that their behavioral problems are more severe and impairing than those exhibited by children without CU traits. Specifically, when the level of conduct problems in past studies was equated, children high on CU traits did show lower levels of anxiety (Frick et al., 1999), which was interpreted as indicating that these children were less distressed by the effects of their behavior given a similar level of severity.[1]

One set of predictions that was not strongly supported by these data are those made for children with conduct problems who are low on CU traits. These children were predicted to show very high levels of emotional reactivity, and the results were generally not consistent with this prediction. For example, in contrast to previous results from a sample of adolescents in a juvenile diversion program (Loney et al., in press), children with conduct problems who were low on CU traits did not show enhanced response facilitation to negative emotional words. Because there is evidence that this enhanced reactivity may be most apparent in social situations involving peer provocation (e.g., Dodge & Coie, 1987; Lochman & Dodge, 1998; Pardini et al., in press), we also included a measure of children's responses to hypothetical vignettes involving peer provocation. Our hypothesized interaction between CU traits and conduct problems for predicting children's attributions of hostile intent to a peer provocateur and their ratings of how angry the provocation would make them was not supported in the main analyses. The only effects to emerge in these analyses were that children high on CU traits made fewer hostile attributions and that younger children endorsed higher levels of angry reactivity to peer provocation.

It is quite possible that this task, which requires self-report in response to hypothetical vignettes, may not be the most sensitive measure of children's emotional reactivity in actual social situations. However, such tasks have proven to differentiate subgroups of children with conduct problems in past research (see Frick & Loney, 2000, for a review). Our post hoc analyses, although needing to be interpreted cautiously, suggest some alternative

explanations for the lack of expected findings. First, the expected finding that children high on conduct problems but low on CU traits would show a tendency to attribute hostile intent to a peer provocateur was obtained only when the analyses were limited to boys (see Figure 2). Past research with these tasks tended to use samples that were either largely or exclusively male (e.g., Dodge & Coie, 1987; Lochman & Dodge, 1998), and therefore it is possible that this hostile attributional bias is present only for boys with conduct problems or that this procedure is sensitive to this bias only in boys. Second, the findings for different levels of reactivity in the two groups of children with conduct problems were found to some degree in analyses limited to children above the median on general intelligence (see Figure 3). As a result, this procedure may require some minimal level of abstraction or verbal ability for a child to accurately report his or her most likely reaction to these hypothetical social situations.

In addition to the potential limitations of this measure of reactivity to peer provocation, all interpretations of these results need to be made in the context of a number of other methodological limitations. It is important to note that the sample in this study was not a clinic-referred sample and that the diagnoses reported in Table 1 were operational diagnoses based on parent and teacher ratings, not clinical diagnoses. Furthermore, the sample was also not a normative sample in that participants were chosen to ensure substantial variability on CU traits and conduct problems. We tried to justify this oversampling procedure in our introduction as a methodology needed to ensure sufficient numbers of children in each of the primary subgroups of interest while still maintaining a representative demographic composition. However, because of this oversampling, it is not clear how well the associations documented in this study would generalize to normative samples with different distributions of these variables. Furthermore, the sample was somewhat small ($n = 98$), and this fact may have limited the study's ability to detect some smaller effects, especially interaction effects, which tend to have smaller effect sizes.

---

[1] In past studies (Frick et al., 1999), we have shown that children with conduct problems who are high on CU traits show high levels of anxiety largely because they also show the highest rates of conduct problems. Further, controlling for the level of conduct problems actually leads to children with CU traits showing lower levels of anxiety than children with similar levels of behavior disturbance. This effect was illustrated by the fact that measures of trait anxiety were positively correlated with conduct problems and impulsivity but uncorrelated with measures of CU traits until the effects of impulsivity and conduct problems were partialed out, thereby controlling for level of behavioral disturbance. When the degree of behavioral disturbance was controlled, a significant negative correlation between CU traits and anxiety emerged. The current sample was not an optimal one in which to conduct such an analysis (but see Frick, Lilienfeld, et al., 2000, for a replication), because the distributions of CU traits and conduct problems were altered by our sampling procedures, which were designed to ensure significant numbers of children with conduct problems and with CU traits. However, a similar suppression effect was present in this sample and can be illustrated with the BASC–PRS Anxiety scale. That is, this scale was significantly correlated with ODD and CD symptoms ($r = .38$, $p < .01$) and with impulsivity–hyperactivity symptoms ($r = .44$, $p < .01$) but was uncorrelated with CU traits ($r = -.01$, ns). However, when the effects of ODD/CD symptoms and impulsivity–hyperactivity symptoms were partialed out, the partial correlation between CU traits and anxiety was significant and negative ($r = -.22$, $p < .05$).

Within the context of these limitations, the results support the potential importance of considering multiple causal pathways in the development of severe antisocial and aggressive behavior. Even more specifically, they add to a growing body of research suggesting that the presence or absence of CU traits may be a useful method for designating such pathways, especially pathways that may differ in the types of emotional dysregulation displayed by children with conduct problems. These results also provide additional motivation for conducting longitudinal studies starting even earlier in development in order to clarify the genesis of the different patterns of emotional regulation, as well as for following children in these subgroups even later in development to determine the degree of continuity involved both in their problems of emotional regulation and in the behavioral manifestations of these problems. For example, as stated previously, a callous and unemotional interpersonal style combined with impulsive and antisocial behavior is similar to the traits exhibited by adults with psychopathy, as are some of the problems in emotional regulation evidenced by antisocial children who show CU traits (Hart & Hare, 1997). It would be important to explicitly test whether this group of children is at high risk for showing this severe, debilitating, and costly pattern of antisocial and violent behavior in adulthood.

Finally, and perhaps most important, this type of research on developmental pathways has great potential for guiding new and innovative approaches to the prevention and treatment of antisocial and aggressive behavior in youth. Most of the interventions developed and tested to date have tended to focus on one or a few causal processes that may be involved in the development of such behavior, and given that any pathway to antisocial behavior involves multiple interacting causal processes, it is not surprising that most of these interventions have proven only minimally effective (Brestan & Eyberg, 1998; Kazdin, 1995). Even the more comprehensive approaches to intervention that have targeted multiple factors that can underlie severe conduct problems (e.g., Conduct Problems Prevention Research Group, 1992) have tended to design single treatment packages for all children with conduct problems. The developmental psychopathology perspective would suggest that because many different causal processes can lead to antisocial behavior, it is likely that interventions would be most successful when tailored to the unique developmental processes underlying the antisocial behavior in subgroups of children with conduct problems (see Frick, 1998b, for examples).

At present, there is only suggestive evidence that this is the case. First, while not specifically based in developmental theory or even on the research studying developmental pathways to conduct disorder, one of the most promising approaches to treating severely antisocial adolescents is one that espouses a comprehensive and individualized approach to intervention (Henggeler & Borduin, 1990). Second, most of the treatments that have been developed and tested for the treatment of conduct problems focus primarily on processes that seem to be involved in children without CU traits, such as problems of anger control or dysfunctional parental socialization strategies (Frick, 1998b). Interventions that more directly target the processes that may be operating for children with CU traits, such as interventions designed to enhance empathic responding or those that capitalize on a child's reward-oriented response style, may be more effective for this group of children with conduct problems.

In addition to guiding what processes need to be targeted in future intervention programs for children with conduct problems, this line of research may also help to uncover a specific set of risk factors for antisocial behavior that can be used to develop prevention programs. That is, in addition to children who show high levels of emotional reactivity and poorly regulated behavior and who are the frequent targets of prevention programs, children who show low behavioral inhibition may also be at risk for serious conduct problems, possibly through its effects on the development of the affective components of conscience (e.g., Blair et al., 1997; Kochanska, 1993). By studying and gaining a better understanding of the processes involved in the different developmental pathways to poorly regulated behavior and conduct problems, researchers may be able to design interventions that can be instituted as early as possible in the developmental trajectory of such behaviors. Thus, the developmental psychopathology perspective not only has important implications for the study of youth with severe conduct problems, it also has the potential for guiding the next generation of intervention programs designed to prevent or treat such problems.

References

American Psychiatric Association. (1994). *The diagnostic and statistical manual of mental disorders* (4th ed). Washington, DC: Author.

Barry, C. T., Frick, P. J., Grooms, T., McCoy, M. G., Ellis, M. L., & Loney, B. R. (2000). The importance of callous–unemotional traits for extending the concept of psychopathy to children. *Journal of Abnormal Psychology, 109,* 335–340.

Blair, R. J. R. (1999). Responsiveness to distress cues in the child with psychopathic tendencies. *Personality and Individual Differences, 27,* 135–145.

Blair, R. J. R., Jones, L., Clark, F., & Smith, M. (1997). The psychopathic individual: A lack of responsiveness to distress cues? *Psychophysiology, 34,* 192–198.

Brestan, E. V., & Eyberg, S. M. (1998). Effective psychosocial treatments for conduct disordered children and adolescents. *Journal of Clinical Child Psychology, 27,* 180–189.

Caputo, A. A., Frick, P. J., & Brodsky, S. L. (1999). Family violence and juvenile sex offending: Potential mediating roles of psychopathic traits and negative attitudes toward women. *Criminal Justice and Behavior, 26,* 338–356.

Christian, R. E., Frick, P. J., Hill, N. L., Tyler, L., & Frazer, D. R. (1997). Psychopathy and conduct problems in children: II. Implications for subtyping children with conduct problems. *Journal of the American Academy of Child and Adolescent Psychiatry, 36,* 233–241.

Cicchetti, D., & Rogosch, F. A. (1996). Equifinality and multifinality in developmental psychopathology. *Development and Psychopathology, 8,* 597–600.

Conduct Problems Prevention Research Group. (1992). A developmental and clinical model for the prevention of conduct disorder: The FAST Track Program. *Development and Psychopathology, 4,* 509–527.

Crick, N. R. (1995). Relational aggression: The role of intent attributions, feelings of distress, and provocation type. *Development and Psychopathology, 7,* 313–322.

Daugherty, T. K., & Quay, H. C. (1991). Response perseveration and delayed responding in childhood behavior disorders. *Journal of Child Psychology and Psychiatry, 32,* 453–461.

Dien, J. (1999). Differential lateralization of trait anxiety and fearfulness: Evoked potential correlates. *Personality and Individual Differences, 26,* 333–356.

Dodge, K. A., & Coie, J. D. (1987). Social-information-processing factors

in reactive and proactive aggression in children's peer groups. *Journal of Personality and Social Psychology, 53,* 1146–1158.

Fisher, L., & Blair, R. J. R. (1998). Cognitive impairment and its relationship to psychopathic tendencies in children with emotional and behavioral difficulties. *Journal of Abnormal Child Psychology, 26,* 511–519.

Fowles, D. C. (1987). Application of a behavioral theory of motivation to the concepts of anxiety and impulsivity. *Journal of Research in Personality, 21,* 417–435.

Frick, P. J. (1998a). Callous–unemotional traits and conduct problems: A two-factor model of psychopathy in children. In D. J. Cooke, A. Forth, & R. D. Hare (Eds.), *Psychopathy: Theory, research, and implications for society* (pp. 161–187*).* Dordrecht, The Netherlands: Kluwer Academic.

Frick, P. J. (1998b). *Conduct disorders and severe antisocial behavior.* New York: Plenum Press.

Frick, P. J., Barry, C. T., & Bodin, S. D. (2000). Applying the concept of psychopathy to children: Implications for the assessment of antisocial youth. In C. B. Gacono (Ed.)*, The clinical and forensic assessment of psychopathy* (pp. 3–24). Mahwah, NJ: Erlbaum.

Frick, P. J., Bodin, S. D., & Barry, C. T. (2000). Psychopathic traits and conduct problems in community and clinic-referred samples of children: Further development of the Psychopathy Screening Device. *Psychological Assessment, 12,* 382–393.

Frick, P. J., & Ellis, M. L. (1999). Callous–unemotional traits and subtypes of conduct disorder. *Clinical Child and Family Psychology Review, 2,* 149–168.

Frick, P. J., & Hare, R. D. (2001). *The Antisocial Process Screening Device (APSD).* Toronto, Canada: Multi-Health Systems.

Frick, P. J., Lilienfeld, S. O., Edens, J. F., Poythress, N. G., & McBurnett, K. (2000). The association between anxiety and antisocial behavior. *Primary Psychiatry, 7,* 52–57.

Frick, P. J., Lilienfeld, S. O., Ellis, M. L., Loney, B. R., & Silverthorn, P. (1999). The association between anxiety and psychopathy dimensions in children. *Journal of Abnormal Child Psychology, 27,* 381–390.

Frick, P. J., & Loney, B. R. (1999). Outcomes of children and adolescents with conduct disorder and oppositional defiant disorder. In H. C. Quay & A. Hogan (Eds.), *Handbook of disruptive behavior disorders* (pp. 507–524). New York: Plenum Press.

Frick, P. J., & Loney, B. R. (2000). The use of laboratory and performance-based measures in the assessment of children and adolescents with conduct disorders. *Journal of Clinical Child Psychology, 29,* 540–544.

Frick, P. J., O'Brien, B. S., Wootton, J. M., & McBurnett, K. (1994). Psychopathy and conduct problems in children. *Journal of Abnormal Psychology, 103,* 700–707.

Gadow, K. D., & Sprafkin, J. (1995). *Manual for the Child Symptom Inventory-4th ed.* Stony Brook, NY: Checkmate Plus.

Gray, J. A. (1982). *The neuropsychology of anxiety: An inquiry into the functions of the septo-hippocampal system.* Oxford, England: Oxford University Press.

Hart, S. D., & Hare, R. D. (1997). Psychopathy: Assessment and association with criminal conduct. In D. M. Stoff, J. Brieling, & J. Maser (Eds.), *Handbook of antisocial behavior* (pp. 22–35). New York: Wiley.

Hauser, R. M., & Featherman, D. L. (1977). *The process of stratification.* New York: Academic Press.

Henggeler, S. W., & Borduin, C. M. (1990). *Family therapy and beyond: A multisystemic approach to treating the behavior problems of children and adolescents.* Pacific Grove, CA: Brooks/Cole.

Kagan, J., & Snidman, N. (1991). Temperamental factors in human development. *American Psychologist, 46,* 856–862.

Kamphaus, R. W., & Frick, P. J. (1996). *Clinical assessment of child and adolescent personality and behavior.* Boston: Allyn & Bacon.

Kaufman, A. S., & Kaufman, N. L. (1990). *Kaufman Brief Intelligence Test manual.* Circle Pines, MN: American Guidance Service.

Kazdin, A. E. (1995). *Conduct disorders in childhood and adolescence* (2nd ed.). Thousand Oaks, CA: Sage.

Kochanska, G. (1993). Toward a synthesis of parental socialization and child temperament in early development of conscience. *Child Development, 64,* 325–347.

Kochanska, G. (1995). Children's temperament, mothers' discipline, and security of attachment: Multiple pathways to emerging internalization. *Child Development, 66,* 597–615.

Kucera, H., & Francis, W. N. (1967). *Computational analysis of present-day American English.* Providence, RI: Brown University Press.

Lahey, B. B., Applegate, B., Barkley, R. A., Garfinkel, B., McBurnett, K., Kerdyk, L., et al. (1994). DSM-IV field trials for oppositional defiant disorder and conduct disorder in children and adolescents. *American Journal of Psychiatry, 151,* 1163–1171.

Lahey, B. B., & Loeber, R. (1994). Framework for a developmental model of oppositional defiant disorder and conduct disorder. In D. K. Routh (Ed.), *Disruptive behavior disorders in childhood* (pp. 139–180). New York: Plenum Press.

Lilienfeld, S. O. (1994). Conceptual problems in the assessment of psychopathy. *Clinical Psychology Review, 14,* 17–38.

Lochman, J. E., & Dodge, K. A. (1998). Distorted perceptions in dyadic interactions of aggressive and nonaggressive boys: Effects of prior expectations, context, and boys' age. *Development and Psychopathology, 10,* 495–512.

Loney, B. R., Frick, P. J., Clements, C. B., Ellis, M. L., & Kerlin, K. (in press). Emotional reactivity and callous unemotional traits in adolescents. *Journal of Clinical Child and Adolescent Psychology.*

Loney, B. R., Frick, P. J., Ellis, M., & McCoy, M. G. (1998). Intelligence, psychopathy, and antisocial behavior. *Journal of Psychopathology and Behavioral Assessment, 20,* 231–247.

Lykken, D. T. (1995). *The antisocial personalities.* Hillsdale, NJ: Erlbaum.

Lynam, D. R. (1996). The early identification of chronic offenders: Who is the fledgling psychopath? *Psychological Bulletin, 120,* 209–234.

Lynam, D. R. (1998). Early identification of the fledgling psychopath: Locating the psychopathic child in the current nomenclature. *Journal of Abnormal Psychology, 107,* 566–575.

Moffitt, T. E. (1993). Adolescence-limited and life-course persistent antisocial behavior: A developmental taxonomy. *Psychological Review, 100,* 674–701.

Moffitt, T. E., Caspi, A., Dickson, N., Silva, P., & Stanton, W. (1996). Childhood-onset versus adolescent-onset antisocial conduct problems in males: Natural history from ages 3 to 18 years. *Development and Psychopathology, 8,* 399–424.

Newman, J. P. (1998). Psychopathic behavior: An information processing perspective. In D. J. Cooke, A. E. Forth, & R. D. Hare (Eds.), *Psychopathy: Theory, research, and implications for society (*pp. 81–104). Boston: Kluwer Academic.

Newman, J. P., Patterson, C. M., & Kosson, D. S. (1987). Response perseveration in psychopaths. *Journal of Abnormal Psychology, 96,* 145–148.

O'Brien, B. S., & Frick, P. J. (1996). Reward dominance: Associations with anxiety, conduct problems, and psychopathy in children. *Journal of Abnormal Child Psychology, 24,* 223–240.

O'Brien, B. S., Frick, P. J, & Lyman, R. D. (1994). Reward dominance among children with disruptive behavior disorders. *Journal of Psychopathology and Behavioral Assessment, 16,* 131–145.

Pardini, D. A., Lochman, J. E., & Frick, P. J. (in press). Callous–unemotional traits and social cognitive processes in adjudicated youth: Exploring the schema of youth with psychopathic traits. *Journal of the American Academy of Child and Adolescent Psychiatry.*

Patrick, C. J. (1994). Emotion and psychopathy: Startling new insights. *Psychophysiology, 31,* 319–330.

Piacentini, J. C., Cohen, P., & Cohen, C. (1992). Combining discrepant diagnostic information from multiple sources: Are complex algorithms

better than simple ones? *Journal of Abnormal Child Psychology, 20,* 51–63.

Reynolds, C. R., & Kamphaus, K. W. (1992). *Behavioral assessment system for children.* Circle Pines, MN: American Guidance Service.

Richters, J. E. (1997). The Hubble hypothesis and the developmentalist's dilemma. *Development and Psychopathology, 9,* 193–230.

Rosen, J. B., & Schulkin, J. (1998). From normal fear to pathological anxiety. *Psychological Review, 105,* 325–350.

Russo, M. F., Stokes, G. S., Lahey, B. B., Christ, M. A. G., McBurnett, K., Loeber, R., et al. (1993). A sensation-seeking scale for children: Further refinement and psychometric development. *Journal of Psychopathology and Behavioral Assessment, 15,* 69–86.

Rusting, C. L. (1998). Personality, mood, and cognitive processing of emotional information: Three conceptual frameworks. *Psychological Bulletin, 124,* 165–196.

Shaffer, D., & Fisher, P. (1996). *National Institute of Mental Health Diagnostic Interview Schedule for Children: Version 4.* New York: Columbia University.

Silverthorn, P., & Frick, P. J. (1999). Developmental pathways to antisocial behavior: The delayed-onset pathway in girls. *Development and Psychopathology, 11,* 101–126.

Stanford, M. S., & Barratt, E. S. (1992). Impulsivity and the multi-impulsive personality disorder. *Personality and Individual Differences, 13,* 831–834.

Tellegen, A., & Waller, N. G. (1994). Exploring personality through test construction: Development of the Multidimensional Personality Questionnaire. In S. R. Briggs & J. M. Cheek (Eds.), *Personality measures*: *Development and evaluation* (Vol. 1, pp. 133–161). Greenwich, CT: JAI Press.

Toglia, M. P., & Battig, W. (1978). *Handbook of semantic norms.* Hillsdale, NJ: Erlbaum.

Williamson, S., Harpur, T. J., & Hare, R. D. (1991). Abnormal processing of affective words by psychopaths. *Psychophysiology, 28,* 260–273.

Wootton, J. M., Frick, P. J., Shelton, K. K., & Silverthorn, P. (1997). Ineffective parenting and childhood conduct problems: The moderating role of callous–unemotional traits. *Journal of Consulting and Clinical Psychology, 65,* 301–308.

AMERICAN PSYCHOLOGICAL ASSOCIATION
SUBSCRIPTION CLAIMS INFORMATION

Today's Date:_____

We provide this form to assist members, institutions, and nonmember individuals with any subscription problems. With the appropriate information we can begin a resolution. If you use the services of an agent, please do **NOT** duplicate claims through them and directly to us. **PLEASE PRINT CLEARLY AND IN INK IF POSSIBLE.**

_____   _____
PRINT FULL NAME OR KEY NAME OF INSTITUTION   MEMBER OR CUSTOMER NUMBER (MAY BE FOUND ON ANY PAST ISSUE LABEL)

_____   _____
ADDRESS   DATE YOUR ORDER WAS MAILED (OR PHONED)

_____PREPAID _____CHECK _____CHARGE
                          CHECK/CARD CLEARED DATE:_____

_____
CITY   STATE/COUNTRY   ZIP   (If possible, send a copy, front and back, of your cancelled check to help us in our research of your claim.)

_____   ISSUES: ____ MISSING ____ DAMAGED
YOUR NAME AND PHONE NUMBER

TITLE   **VOLUME OR YEAR**   **NUMBER OR MONTH**

_____   _____   _____

_____   _____   _____

_____   _____   _____

Thank you. Once a claim is received and resolved, delivery of replacement issues routinely takes 4–6 weeks.

──────── **(TO BE FILLED OUT BY APA STAFF)** ────────

DATE RECEIVED: _____   DATE OF ACTION: _____
ACTION TAKEN: _____   INV. NO. & DATE: _____
STAFF NAME: _____   LABEL NO. & DATE:_____

Send this form to APA Subscription Claims, 750 First Street, NE, Washington, DC 20002-4242

PLEASE DO NOT REMOVE. A PHOTOCOPY MAY BE USED.