

The Association between Anxiety and Psychopathy Dimensions in Children

Paul J. Frick,^{1,4} Scott O. Lilienfeld,² Mesha Ellis,³ Brian Loney,³
and Persephanie Silverthorn¹

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Although several theoretical models posit that low levels of anxiety are a risk factor for psychopathy and antisocial behavior, a number of studies have reported elevated levels of anxiety among antisocial individuals. Nevertheless, most investigators in this literature have not distinguished between fearfulness and trait anxiety or attempted to separate the antisocial lifestyle dimension from the callous and unemotional dimension of psychopathy. In a study of clinically referred children ($N = 143$), we found that (a) measures of trait anxiety and fearlessness (low fearfulness) exhibited low correlations; (b) conduct problems tended to be positively correlated with trait anxiety, whereas callous and unemotional traits tended to be negatively correlated with trait anxiety; and (c) controlling statistically for the effects of one dimension increased the divergent correlations of the other dimension with both trait anxiety and fearful inhibition. These findings bear potentially important implications for the diagnosis and etiology of psychopathy and antisocial behavior and suggest that distinctions between trait anxiety and fearful inhibition, as well as between the two dimensions of psychopathy, may help to clarify longstanding confusion in this literature.

KEY WORDS: Anxiety and conduct problems; fearlessness; childhood psychopathy; callous and unemotional traits.

There is a well-documented correlation between anxiety and antisocial behavior in children (Russo & Beidel, 1993; Zoccolillo, 1992), adolescents (Krueger *et al.*, 1994), and adults (Robins, Tipp, & Pryzbeck, 1991). The rates of anxiety disorders in conduct disordered children range from 22% to 33% in community samples and from 60% to 75% in clinic-referred or institutionalized samples (see Russo & Beidel, 1993, and Zoccolillo, 1992, for reviews). The association between these two psychological domains is not limited to categorical diagnoses. Significant correlations between antisocial behavior and anxiety are also found using continuous scores from childhood behavior rating scales (Fergusson & Horwood, 1993) and adult personality inventories (Butcher, Graham, Williams, & Ben-Porath, 1990). Moreover, adults with

antisocial personality disorder have been found to be at heightened risk for numerous anxiety disorders, including obsessive-compulsive disorder and panic disorder (e.g., Boyd *et al.*, 1984).

The association between anxiety and antisocial behavior poses a conceptual quandary for psychopathology researchers. Several theories focus on a lack of fearful inhibition (Cloninger, 1987; Gray, 1982; Lykken, 1982, 1995) or the absence of anxiety (Cleckley, 1941/1982) as dispositions for psychopathy, antisocial behavior, or both. The high levels of anxiety reported by antisocial individuals appear difficult to reconcile with these theoretical approaches. Some researchers have approached this issue by positing two distinct groups of antisocial individuals. The first group comprises individuals with low levels of anxiety. These individuals have been labeled primary psychopaths as adults (e.g., Blackburn, 1998) or undersocialized delinquents as children or adolescents (e.g., Quay, 1987). The second group comprises antisocial individuals with high levels of anxiety. These individuals have been labeled secondary psychopaths as adults

¹University of New Orleans, New Orleans, Louisiana.

²Emory University, Atlanta, Georgia.

³University of Alabama, Tuscaloosa, Alabama.

⁴Address all correspondence to Paul J. Frick, Department of Psychology, University of New Orleans, 2001 Geology and Psychology Bldg., New Orleans, LA 20148. E-mail: pfrick@uno.edu.

(e.g., Blackburn, 1998) or neurotic delinquents as children or adolescents (Quay, 1987). The validity of this distinction has been supported by research showing that antisocial individuals with versus without high levels of anxiety exhibit different correlates, some of which may be linked to distinct etiological factors (McBurnett *et al.*, 1991; Newman & Wallace, 1993; O'Brien, Frick, & Lyman, 1994). For example, psychopathic individuals who score low on measures of trait anxiety tend to perform more poorly on measures of passive avoidance learning than psychopathic individuals who score high on measures of trait anxiety (e.g., Newman, Widom, & Nathan, 1985).

Although this typology has been helpful in guiding research, it does not address two issues that have limited our understanding of the association between anxiety and antisocial behavior. The first issue, which has typically been neglected in the literature, is the distinction between fearfulness and trait anxiety (Lilienfeld, 1994; Tellegen & Waller, 1994; Watson & Clark, 1984). Fearfulness is typically conceptualized as a sensitivity to cues of impending danger (Gray, 1982; Tellegen, 1978/1982) and loads on the higher-order personality dimension of constraint (Depue & Spoont, 1987). In contrast, trait anxiety is typically conceptualized as distress resulting from the perception that impending danger and negative consequences are inevitable (Tellegen, 1978/1982) and loads on the higher-order personality dimension of negative affectivity (NA) (Tellegen & Waller, 1994). NA is a pervasive dimension that is similar to, although broader than, neuroticism and reflects a propensity to experience negative emotions of many kinds, including anxiety, irritability, and mistrust. Although fearfulness and trait anxiety are often regarded as similar or even identical constructs, measures of these constructs tend to exhibit only weak intercorrelations (Watson & Clark, 1984). Moreover, emerging data in neuroscience suggest that fear and anxiety are underpinned by distinct physiological systems (Dien, 1999; Rosen & Schulkin, 1998).

Some authors have argued that trait anxiety can be a consequence of exposure to stressful events, and that some individuals, particularly those prone to risk-taking, may experience high levels of trait anxiety because of their stable propensities to encounter and produce stressful events (Fowles, 1987; Tellegen, 1978/1982). Although there is no definitive evidence that repeated stressful events can lead to elevated levels of trait anxiety, exposure to chronic stressors has been found to produce irritability and physiological alterations (e.g., elevated heart rate) that persist even after the cessation of these stressors (Frankenhauser, 1978). This line of reasoning suggests that the high levels of trait anxiety in antisocial individuals is not in principle incompatible with theories (e.g., Lykken, 1995) that

propose that such individuals lack fearful inhibition (i.e., fearlessness). In fact, given the high rate of stressful events (e.g., criticisms from others, incarceration, familial and marital discord, financial difficulties) encountered by antisocial individuals (Robins *et al.*, 1991; Walker *et al.*, 1991), it is plausible that these individuals would experience high levels of trait anxiety as a consequence of these events (Fowles, 1987, 1988; Lilienfeld, 1994). Although Frankenhauser's (1978) research is consistent with the hypothesis that cumulative exposure to stressors over prolonged time periods may result in persistent levels of trait anxiety, it is also possible that elevated trait anxiety levels may arise as a short-term consequence of antisocial behavior. For example, adults whose antisocial behavior brings them into contact with the legal system often experience a marked and sudden increase in negative affect (Duckworth & Anderson, 1995). If such findings extend to children and adolescents, they might help to explain the association between antisocial behavior and anxiety in youthful samples (Krueger *et al.*, 1991; Russo & Beidel, 1993).

A second finding that may be critical for clarifying the association between anxiety and antisocial behavior is that the construct of psychopathy (Cleckley, 1941/1982) can be explained by two correlated dimensions of behavior in both children (Frick, O'Brien, Wootton, & McBurnett, 1994) and adults (Harpur, Hare, & Hakstian, 1989). One dimension can be conceptualized as an impulsive and antisocial lifestyle and is characterized by a short temper, irresponsible and impulsive actions, and criminal activities. The second dimension can be conceptualized as a callous and unemotional interpersonal style and is characterized by shallow and superficial emotions, an absence of guilt and empathy, and a callous use of others.

When these two dimensions are separated in children (Frick, 1998) and adults (Hare, Hart, & Harpur, 1991), they exhibit different correlates. For example, conduct problems in children and an antisocial lifestyle in adults is more strongly associated with intellectual deficits and a dysfunctional family background (Christian, Frick, Hill, Tyler, & Frazer, 1997; Hare *et al.*, 1991), whereas the callous and unemotional dimension is more strongly associated with deficits in the processing of emotional stimuli (O'Brien & Frick, 1996; Patrick, Bradley, & Lang, 1993). In addition, whereas the former dimension tends to be positively correlated with trait anxiety, the latter dimension tends to be negatively correlated with trait anxiety (Harpur *et al.*, 1989). Because many measures of psychopathy contain a mixture of items assessing the impulsive and antisocial lifestyle dimension and the callous and unemotional dimension (Hare *et al.*, 1991; Lilienfeld, 1994), it is possible that much of the confusion concerning the

relation of psychopathy to trait anxiety stems from a failure to differentiate these two dimensions (see Lilienfeld, 1994).

Based on these important issues concerning the relation between anxiety and antisocial behavior, the goal of this study was to examine several predictions concerning the associations among fearlessness, trait anxiety, and the two dimensions of psychopathy in a clinic-referred sample of children. On the basis of existing research, we tested the prediction that measures of trait anxiety would not be highly correlated with a measure of fearlessness because these are posited to represent two distinct psychological dimensions. Second, we tested the prediction that measures of trait anxiety and measures of fearlessness would exhibit differential associations with the two dimensions of psychopathy. Specifically, we predicted that trait anxiety would be positively associated only with conduct problems, whereas fearlessness would be associated only with callous and unemotional traits. An important issue that we addressed in examining these differential associations was the need to control for the correlation between the two dimensions of psychopathy, which is approximately $r = .50$ in both clinic-referred samples of children (Frick *et al.*, 1994) and forensic adult populations (Hare *et al.*, 1991). We hypothesized that controlling for the effects of each dimension would provide a clearer picture of the discriminant correlations between the other dimension and measures of both anxiety and fearlessness (see also Patrick, 1994).

METHOD

Participants

Participants were 143 children between the ages of 6 and 13 who were drawn from 154 consecutive referrals to a diagnostic and referral service of a university-based outpatient mental health clinic. Children who scored in the mentally retarded range ($n = 8$) or who were diagnosed with autistic disorder ($n = 1$) were excluded. In addition, 2 children were eliminated from the analyses because their scores on the main study measures were above three standard deviations from the mean and were therefore considered outliers. The mean age of the sample was 8.65 years ($SD = 2.0$), and the sample was predominantly male (77%) and Caucasian (76%). All but 2 of the minority participants were African American. The participants tended to come from families in the lower to lower-middle socioeconomic statuses (SES), with a mean score on Duncan's Socioeconomic Index (Hauser & Featherman, 1977) of 36.3 ($SD = 24.4$). The mean full scale IQ of the sample

(Wechsler, 1974, 1991) was 93.9 ($SD = 12.7$), indicating that participants tended to be somewhat below average in measured intelligence.

Measures

Conduct Problems. *Diagnostic and Statistical Manual for Mental Disorders* (3rd ed., rev.; *DSM-III-R*) symptoms of oppositional defiant disorder (ODD) and conduct disorder (CD; American Psychiatric Association, 1987) were assessed using the highly structured NIMH Diagnostic Interview Schedule for Children—Version 2.3 (DISC-2.3; Shaffer, Fisher, Piacentini, Schwab-Stone, & Wicks, 1992).⁵ The symptoms of ODD and CD, which were correlated at $r = .64$ ($p < .001$), were combined to form a composite index of conduct problem symptoms. Three versions of the DISC were used. A custodial parent completed the DISC-P, and each child's primary teacher (e.g., in most cases, the homeroom teacher) completed the DISC-T. Children ages 9 and older were administered the self-report DISC-C. This self-report version of the DISC was administered only to older children, because information from younger children from the structured interview format has generally proven to be unreliable (Hodges & Zeman, 1993; Kamphaus & Frick, 1996). Information from multiple informants was combined using the approach recommended by Piacentini, Cohen, and Cohen (1992), in which a symptom was considered present if it was endorsed by any informant. Also, information was used only from informants who have been found to be valid for assessing a given symptom domain (see Kamphaus & Frick, 1996, for a review). Specifically, parent and teacher reports were used to assess conduct problems.

The DISC interviews were administered by either advanced graduate students in clinical psychology or a licensed psychologist trained in the assessment of childhood psychopathology. All interviewers were trained in

⁵Data collection began prior to the publication of the *DSM-IV* (American Psychiatric Association, 1994). Therefore, we used the symptom list from the *DSM-III-R* criteria for oppositional defiant disorder (ODD) and conduct disorder (CD). However, for two reasons it is likely that our results will be applicable to *DSM-IV* criteria. First, there is extensive overlap between the two operationalizations, with over 90% of the children diagnosed by one criterion set being diagnosed by the other (Lahey *et al.*, 1994). Second, we used the combined ODD and CD symptom lists in all analyses. The *DSM-IV* field trials indicated that most children who met *DSM-III-R* criteria for CD, but not the more stringent *DSM-IV* criteria for CD, exhibited sufficient conduct problems to meet criteria for ODD. Therefore, by using continuous symptom lists we likely captured the variations in severity that produce discrepancies between the two most recent versions of the *DSM*.

standardized DISC administration procedures, and the same interviewer administered the DISC-P, the DISC-C, and DISC-T for each child. In 60 cases, the DISC-P interviews were observed through a one-way mirror. The agreement between the symptoms coded by the observer and the primary interviewer was used as the estimate of reliability and was calculated only if the symptom was present at least three times when an observer was present. The kappas for the conduct problem symptoms ranged from .65 to 1.0, with a median kappa of 1.0.

A second measure of conduct problems was the Aggressive Behavior subscale of the Child Behavior Checklist (CBCL; Achenbach, 1991). The CBCL is a standardized and widely used behavior rating scale that was completed by each child's parent. The CBCL contains 112 items that are rated on a 0 (Not true) to 2 (Very true or Often true) scale. Despite its name, the 20-item Aggressive Behavior subscale assesses a wide range of conduct problems, including oppositional ("Argues a lot") and noncompliant ("Disobedient at home") behaviors as well as more serious conduct problems ("Gets into many fights"). In the current sample, the items that compose this scale were internally consistent, with a coefficient alpha of .92.

Trait Anxiety. The DISC-2.3 was also used to assess the symptoms of overanxious disorder (OAD), separation anxiety disorder, social phobia, and simple phobia according to *DSM-III-R* criteria. Symptoms of these disorders were combined and used to form a composite index of trait anxiety. The correlations among these symptom scales ranged from .03 ($p < ns$; social phobia and separation anxiety symptoms) to .69 ($p < .001$; separation anxiety and overanxious symptoms). A second variable using only the OAD symptoms was also used in the analyses because symptoms of chronic worry and generalized anxiety appear to provide the best approximation of trait anxiety as it has been used in past studies. Due to the internalizing nature of these symptoms that are often not noticed by teachers (Kamphaus & Frick, 1996), parent and child reports were combined to form this composite. The kappas for anxiety symptoms between the interviewer and observer ranged from .85 to 1.0, with a median kappa of 1.0.

The 14-item Anxious-Depressed scale of the CBCL was used as an additional measure of trait anxiety. The items that compose this scale encompass a wide range of both anxious ("Nervous, high strung, or tense," "Worries") and dysphoric ("Unhappy, sad, or depressed," "Cries a lot") behaviors. These items were internally consistent in this sample, with a coefficient alpha of .86.

Childhood Psychopathy. The Psychopathy Screening Device (PSD; Frick & Hare, in press) is a 20-item behavior rating scale that was completed by each child's

parent and teacher. The PSD was designed to be a childhood extension of the Psychopathy Checklist-Revised (PCL-R; Hare, 1991), which has been widely used to measure psychopathic characteristics in adults. Each item on the PSD is scored either 0 (Not at all true), 1 (Sometimes true), or 2 (Definitely true). Frick *et al.* (1994) found that the PSD contains two factors in clinic-referred children. The Callous-Unemotional (CU) factor contains 6 items assessing the interpersonal and affective dimensions of psychopathy, such as lack of guilt, absence of empathy, and absence of deep emotions. The Impulsivity/Conduct Problems (I/CP) factor contains 10 items assessing the impulsive and antisocial behaviors of psychopathy, such as acting without thinking, risk-taking, and illegal activities. Scales derived from this factor analysis were used in the present study. A sum of parent and teacher ratings of each item was used in all analyses to approximate the multiinformant procedure used to assess *DSM-III-R* symptoms. In this sample, the coefficient alphas for the combined parent and teacher report of the CU and I/CP scales were .73 and .84, respectively. The correlations between parent and teacher ratings for the CU and I/CP scales were .26 ($p < .001$) and .28 ($p < .001$), respectively.

Fearlessness. The Thrill and Adventure Seeking (TAS) subscale from the Sensation Seeking Scale for Children (SSSC; Russo *et al.*, 1991; Russo *et al.*, 1993) is a self-report measure of fearlessness that is analogous to the TAS subscale of the adult Sensation Seeking Scale (SSS) (Zuckerman, Kolin, Price & Zoob, 1964). The format of the SSSC is similar to the adult scale in that respondents indicate which of two choices best describe them. One choice indicates a preference for sensation seeking behaviors (e.g., "I think riding fast on a skateboard is fun"), and the other indicates a preference against these behaviors (e.g., "Some of the daring acts of skateboard riders seem scary to me"). Factor analyses of the SSSC in a large sample ($N = 828$) of elementary- and middle-school children yielded three reliable factors (Russo *et al.*, 1993). The first factor is the TAS, which accounts for the most variance (17%) within the full SSSC scale.

Watson and Clark (1984) noted that the TAS subscale of the adult version of the SSS can be thought of as a measure of the lower-order dimension of fearlessness (Watson & Clark, 1984), which in turn loads on a higher-order dimension of constraint (Tellegen, 1978/1982). In addition, Levenson, Kiehl, and Fitzpatrick (1995) reported that the TAS subscale of the adult SSS was moderately to highly ($r = -.50$) negatively correlated with a measure of harm avoidance, which can be conceptualized as fearlessness in reverse (Tellegen & Waller, 1994). Moreover, Levenson *et al.* found that the TAS subscale was the most highly (negatively) correlated of all SSS subscales with harm

avoidance, suggesting that this subscale may be the best SSS marker of fearlessness. The 12-item childhood TAS subscale was internally consistent in this sample, with a coefficient alpha of .77.

Procedure

The measures were administered as part of a comprehensive psychological evaluation for children referred to the university-based outpatient clinic. On their initial visit to the clinic, all referred children and their parents were asked to consent to the use of assessment data in research. They were told that their willingness to participate in research would in no way affect the clinical services they received. No parent or child refused participation. Following informed consent, parents were administered a semistructured interview to obtain demographic information and were then administered the DISC-P. Following the DISC-P, the parents completed the PSD and CBCL. While parent data were collected, children were administered an intelligence test to screen for mental retardation. Following a break for lunch, children over the age of 9 were administered the DISC-C. The child's teacher was contacted and administered the DISC-T by telephone within the week following the evaluation and was mailed the PSD along with a self-addressed stamped envelope. All teachers agreed to participate.

RESULTS

Descriptive statistics for the major study variables are displayed in Table I. To examine the convergent validity of the main constructs of interest, zero-order correlations of the variables within each construct were computed. The measures of conduct problems were all highly intercorrelated, with the correlations among *DSM-III-R* conduct problems composite (CP), the CBCL Aggressive Behavior scale (CBCL-AGG), and the PSD Impulsive-Conduct Problems scale ranging from .63 to .72 (all p s < .001). Similarly, the measures of anxiety were highly intercorrelated. The *DSM-III-R* anxiety symptom (ANX) composite was correlated significantly with the CBCL Anxious-Depression scale (CBCL-ANDE; $r = .56, p < .001$), and the *DSM-III-R* overanxious symptom (OAD) composite and CBCL-ANDE were highly correlated ($r = .52, p < .001$). As expected from past research, the CU scale of the PSD was moderately but significantly correlated with the measures of conduct problems. These correlations ranged from .33 ($p < .001$) with the CBCL-AGG scale to .58 ($p < .001$) with the I/CP scale of the PSD.

Table I. Descriptive Statistics for Major Study Variables

Variable	<i>M</i>	<i>SD</i>	Range
Thrill and adventure seeking	6.82	3.1	0-12
CBCL anxiety/depression	5.55	5.1	0-22
Anxiety symptoms	3.78	3.6	0-16
Overanxious symptoms	.92	1.5	0-7
CBCL aggression	12.44	8.8	0-38
Conduct problem symptoms	4.61	3.9	0-13
PSD impulsive-conduct problems	14.22	6.3	2-32
PSD callous-unemotional	8.89	3.9	0-19

Note. Thrill and adventure seeking = Thrill and Adventure Seeking subscale of the Children's Sensation Seeking Scale (Russo *et al.*, 1993); CBCL = Child Behavior Checklist-1991 (Achenbach, 1991); Anxiety symptoms = *DSM-III-R* symptoms of overanxious disorder, separation anxiety, social phobia, simple phobia, and panic disorder based on parent and child report on a structured interview; Conduct problem symptoms = *DSM-III-R* symptoms of conduct disorder and oppositional defiant disorder based on parent and teacher report on a structured diagnostic interview; PSD = Psychopathy Screening Device (Frick & Hare, in press).

The correlations between the major study variables and demographic variables were also examined. Age was positively associated with scores on the TAS subscale of the SSSC ($r = .15, p < .05$) and the two scales from the PSD (I/CP, $r = .18, p < .05$; CU, $r = .18, p < .05$). Ethnicity (coded 1 for Caucasian and 2 for African American or other ethnicity) was positively associated with the I/CP ($r = .17, p < .05$) and CU ($r = .22, p < .01$) scales, and SES was negatively associated with the I/CP ($r = -.19, p < .01$) and the CU scales ($r = -.33, p < .001$). Gender (coded 1 for boys and 2 for girls) was negatively associated with the TAS subscale ($r = -.35, p < .001$), and full scale IQ was positively associated with the TAS subscale ($r = .17, p < .05$).

Because of these correlations, partial correlations were used to compare the associations across the psychological domains of interest after controlling for demographic variables (i.e., age, ethnicity, gender, SES, and full scale IQ). These partial correlations are reported in Table II. Consistent with our hypotheses, the TAS subscale's measure of fearlessness was essentially uncorrelated with measures of trait anxiety after controlling for demographic variables. Also, consistent with our hypotheses, the three measures of trait anxiety were significantly and positively correlated with the measures of conduct problems. The one exception was the I/CP scale, which was significantly associated with only one of the measures of trait anxiety. More important, however, the CU scale was not associated with any of the measures of

Table II. Partial Correlations Controlling for Demographic Variables and Either Conduct Problems or Callous-Unemotional Traits

	Thrill & adventure seeking	CBCL anx/dep	DSM-III-R anxiety	DSM-III-R overanxious
Thrill & adventure seeking		-.06	.04	-.01
CBCL aggression	-.11/-.16*	.64***/.69***	.32***/.39***	.29***/.36***
Conduct problems	-.09/-.16*	.37***/.43***	.30***/.41***	.30***/.41***
PSD impulsive-conduct problems	.00/-.08	.28***/.35***	.09/.19*	.07/.17*
PSD callous-emotional	.12/.18*	-.02/-.24**	-.12/-.31***	-.13/-.32***

Note. Correlations on left side of / are partial correlations controlling for demographic variables (Full Scale intelligence, age, ethnicity, gender, and socioeconomic status) only. Correlations on right side of / are partial correlations controlling for demographic variables and either callous-unemotional traits or conduct problem symptoms.

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

trait anxiety and, in fact, showed nonsignificant negative correlations with these measures. After controlling for demographic variables, the TAS subscale was not associated with any of the measures of conduct problems ($r = .00$ to $-.11$) or with the CU scale ($r = .12$).

The final set of analyses examined (a) the associations among conduct problems, fearlessness, and trait anxiety after controlling for CU traits and (b) the association among CU traits, fearlessness, and trait anxiety after controlling for DSM-III-R conduct symptoms.⁶ These partial correlations, which also control for demographic variables as in the previous analyses, are presented in Table II. This second set of partial correlations was more strongly supportive of our hypotheses. For example, all of the partial correlations between conduct problem measures and trait anxiety were significant after controlling for CU traits. In contrast, the partial correlations between callous-unemotional traits and trait anxiety were all significant and negative after controlling for conduct problems. The differential associations among fearlessness, conduct problems, and CU traits also became clearer in these analyses. The TAS subscale was negatively correlated with two of the three measures of conduct problems after controlling for CU traits, but was significantly

positively correlated with CU traits after controlling for conduct problems.⁷

The fact that most of the correlations became stronger after partialing out either conduct problems or CU traits suggests the operation of cooperative suppressor effects (Cohen & Cohen, 1983). Specifically, the correlation between CU and conduct problems appears to suppress the divergent correlations between these domains and the various measures of anxiety and fearlessness. This suppressor effect is illustrated in Fig. 1, where the regression line (after controlling for demographic variables) for CU traits predicting OAD symptoms was calculated separately for those children above the median on conduct problems and those at or below the median on this measure. As shown in Fig. 1, the slope of the regression line is negative in both cases. Nevertheless, the slope is much steeper and significant only in children above the median on conduct problems. Moreover, the regression lines do not converge, suggesting that children high in conduct problems tended to exhibit more anxiety symptoms at all levels of CU traits. Nevertheless, this level of divergence between the regression lines was much greater at low levels of these traits.⁸

DISCUSSION

The analyses supported several of our key predictions. As expected, the measure of fearlessness was essentially uncorrelated with measures of trait anxiety. Furthermore, these two constructs demonstrated different patterns of correlations with the two dimensions of psychopathy. The

⁶Analyses using the other measures of conduct problems (Child Behavior Checklist-Aggression and the Impulsivity/Conduct Problems scale of the Psychopathy Screening Device) in partial correlations yielded very similar results. These analyses are available from Paul J. Frick on request. We present the results based on DSM-III-R conduct problems because this is the most widely used and accepted measure of conduct symptoms.

⁷Because we had clear theoretical reasons for separating the two dimensions of psychopathy when testing their correlations with anxiety and fearfulness, we did not focus on the total score of the Psychopathy Screening Device (PSD). However, the correlations between the PSD total score and the three measures of trait anxiety ranged from .02 ($p = ns$) to .21 ($p < .01$), whereas the correlation between the PSD total score and the TAS subscale was .06 ($p = ns$).

⁸We repeated the partial correlations separately for boys ($n = 110$) and girls ($n = 32$) in our sample. Given the small number of girls, these analyses should be viewed as exploratory. Not surprisingly given the large proportion of boys in the full sample, the results for boys was virtually identical to that found in the full sample. More important, the pattern of results for girls was also quite similar to that reported in Table II.

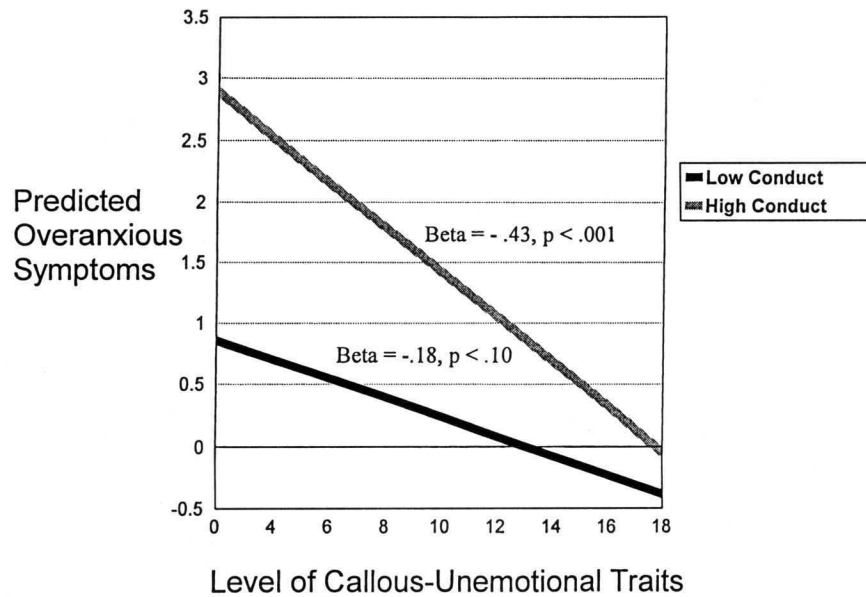


Fig. 1. Regression line showing association between generalized anxiety symptoms and callous-unemotional traits separated by those children showing conduct problems above the median (high conduct) and those showing conduct problems at or below the median (low conduct). The regression line shows predicted levels of anxiety after controlling for demographic variables.

measures of trait anxiety exhibited consistent positive correlations with measures of conduct problems and were either uncorrelated or negatively correlated with the measure of CU traits. This pattern of findings supports our contention that the association between anxiety and antisocial behavior found in past studies is due primarily to the use of measures of (a) trait anxiety and (b) an antisocial lifestyle.

Although the measure of fearlessness displayed a different pattern of associations with the two psychopathy dimensions than did the measures of trait anxiety, the association between fearlessness and the two psychopathy dimensions was neither as strong nor as consistent as expected. These associations became clearer, however, when the correlation between the two psychopathy dimensions was taken into account. Specifically, fearlessness was significantly correlated with CU traits after controlling for the presence of conduct problems, although the correlation remained quite modest. Fearlessness was significantly negatively correlated with two of the three measures of conduct problems, although the correlations were again modest in magnitude.

There were several other instances in which controlling for the association between the two psychopathy dimensions increased the correlations of each dimension with measures of anxiety and fearlessness. This cooperative suppressor effect was most pronounced in the

correlations between CU traits and measures of trait anxiety, whereby the negative correlations between these measures became much stronger after controlling for the level of conduct problems. These results are consistent with the findings of Patrick (1994), who reported that controlling for the effects of each PCL-R factor increased the divergent correlations of the other factor with a measure of negative affectivity, and those of McHoskey, Worzel, and Szyarto (1998), who reported that the correlations between neuroticism and Levenson *et al.*'s (1995) primary and secondary psychopathy scales (which were designed to assess the PCL-R callous-unemotional and antisocial lifestyle factors, respectively) become more divergent after controlling for the effects of the other scale.

The pattern of associations we have reported not only supports our contention that trait anxiety is differentially associated with the two dimensions of psychopathy (see also Hare *et al.*, 1991; Harpur *et al.*, 1989), but it helps to explain some of the confusion in interpreting the association between anxiety and conduct problems in children. Specifically, Walker *et al.* (1991) found that children with both anxiety disorders and CD were much less impaired on several measures of adjustment than children with CD without anxiety disorders, suggesting that anxiety may play a protective role in children with CD. In contrast, Zoccolillo (1992) reviewed a number of studies suggesting that children and adolescents with cooccurring anxiety

and CD represent the most severely disturbed subgroup of CD children.

The influence of CU traits on the relation between conduct problems and trait anxiety provides one possible explanation for this paradox. In community samples or samples with a large number of children with mild conduct problems (Zoccolillo, 1992), the severity of conduct problems would be expected to be positively associated with measures of trait anxiety. As a consequence, the children with the most severe levels of conduct problems are those most likely to exhibit high rates of anxiety problems. However, among children with CD (Walker *et al.*, 1991), all of whom have relatively high rates of conduct problems and trait anxiety, those children with high levels of CU traits show less trait anxiety, which we interpret as indicating that they are less distressed by their behavior than children lower on these traits. Either because of the relative lack of distress over their behavior (Quay, 1987) or because of the presence of CU traits (Christian *et al.*, 1997), these children would be expected to exhibit more impairment associated with their conduct problems. Although this explanation accords with the data we have presented, it needs to be examined further in other samples.

In summary, our findings suggest that measures of fearlessness and trait anxiety assess different constructs (Lilienfeld, 1994; Tellegen & Waller, 1994; Watson & Clark, 1984). Furthermore, the pattern of correlations supports our contention that the association between anxiety and antisocial behavior found in past studies is due primarily to the use of measures of trait anxiety and an antisocial lifestyle. The differential associations with the two dimensions of psychopathy provide further evidence for the need to separate these dimensions in both child and adult samples, especially when examining their associations with measures of anxiety and fearlessness (Frick, 1998; Hare *et al.*, 1991) or when studying the performance of persons with psychopathic traits on tasks that are sensitive to the effects of anxiety (e.g., Newman, Patterson, & Kosson, 1987; O'Brien & Frick, 1996).

Perhaps the most important implication of our findings, however, is their potential to reconcile models positing a temperamental lack of fearful inhibition as a key predisposing factor for psychopathic behavior (Cloninger, 1987; Gray, 1982; Lykken, 1995) with findings of a high rate of anxiety among antisocial individuals (Robins *et al.*, 1991; Russo & Beidel, 1993; Zoccolillo, 1992). Our results are consistent with a model in which fearlessness is more specifically associated with the callous and unemotional dimension of psychopathy (see also Frick, 1998; Patrick *et al.*, 1993). In contrast, children who exhibit antisocial behavior may experience emotional distress (trait

anxiety) secondary to the numerous stressors they experience as a result of their maladaptive behaviors. Antisocial individuals who show callous and unemotional traits may also show high rates of distress, albeit at a somewhat lower level than antisocial individuals without such traits (see Fig. 1).

Our findings appear to run counter to those of Harpur *et al.* (1989), who reported that all four subscales of the adult SSS, including the TAS subscale, tended to be more highly related to the antisocial lifestyle factor of the PCL-R than to the callous-unemotional dimension in a prison sample. At least two explanations for the discrepancy between the present findings and those of Harpur *et al.* must be considered. First, it is possible that the meaning of the two psychopathy factors shifts over the course of development, although additional research on the differential correlates of these two factors as a function of age will be necessary to test this hypothesis. A second, and not incompatible, hypothesis is that our findings reflect a difference in the content and correlates of the TAS compared with other sensation-seeking subscales. Consistent with this possibility, Frick *et al.* (1994) found that only the TAS scale of the SSSC was significantly associated with the CU factor of the PSD, and the other dimensions of SSSC were more strongly (yet not significantly) associated with the I/CP factor. Moreover, Zuckerman's (1994) review of the correlates of sensation-seeking suggested that across a number of studies (e.g., Wallbank, 1985), the TAS subscale of the adult SSS appears to be less related to criminality and delinquency than other SSS subscales. Thus, it is possible that thrill and adventure seeking, in contrast to other components of sensation-seeking, bears only a relatively weak relation to antisocial behavior in adults and conduct problems in children. Nevertheless, the inconsistent findings in this area (e.g., Harpur *et al.*, 1989) suggest that further research on the correlates of the TAS subscale in both children and adults is necessary.

All of our interpretations need to be offered in light of two caveats. First, because our sample was based on clinically referred children, these results will need to be replicated in nonreferred samples. Second, because we assessed fearlessness by means of only one measure, our conclusions would be buttressed by constructive replication (Lykken, 1968) of our findings using alternative indexes of this construct. A similar case could be made with our use of the PSD. Replication using other common measures of psychopathy, such as the PCL-R (Hare, 1991) or the Psychopathic Personality Inventory (Lilienfeld & Andrews, 1996), would be important for testing our theoretical predictions. Despite these limitations, however, our results raise an important theoretical and methodological issue for future research. Namely, in examining the as-

sociation between anxiety and antisocial behavior, it is critical to distinguish between fearlessness and trait anxiety and between callous-unemotional traits and an antisocial lifestyle. Given the pivotal role accorded to anxiety in many theories of psychopathy and conditions characterized by antisocial behavior (e.g., Gray, 1982; Lykken, 1995), these distinctions may be necessary to clarify the potential etiological role played by fearlessness and trait anxiety in these syndromes.

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