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Psychopathy and Negative Emotionality: Analyses of Suppressor Effects Reveal Distinct Relations With Emotional Distress, Fearfulness, and Anger–Hostility

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Abstract

Low negative emotionality (NEM) holds a central place in classic descriptions and seminal theories of psychopathy. However, the empirical link between low NEM and psychopathy is weak. The authors posited that this inconsistency is due to the multifaceted nature of both the NEM and psychopathy constructs and to suppressor effects between facets of psychopathy in relation to NEM criteria. The authors sought to delineate the differential associations between facets of psychopathy and NEM in a large sample of male prisoners using the Psychopathy Checklist—Revised (PCL–R; R. D. Hare, 2003) and self-report measures assessing different aspects of NEM. Statistical analyses revealed that the interpersonal–affective facet of psychopathy is negatively associated whereas the social deviance facet of psychopathy is positively associated with facets of NEM. The results demonstrate that suppressor effects can reconcile the centrality of NEM in classic descriptions of psychopathy with empirical investigations using the PCL–R.

Keywords

psychopathy; negative affect; suppressor effects; Psychopathy Checklist—Revised

Explicating the relationship between psychopathy and negative emotionality (*NEM*; the tendency to experience unpleasant emotional states such as fear, anger, and nervous tension) has been one of the most challenging and conceptually important issues in psychopathy research. Although low anxiety and fearlessness have featured prominently in many clinical descriptions and theories of psychopathy (Cleckley, 1941; Fowles, 1980; Karpman, 1948; Lykken, 1995; Patrick, in press), empirical investigations often yield weak, inconsistent, or complex effects, creating confusion regarding the etiological significance of low NEM in psychopathy (cf. Hare, 2003). We contend that these difficulties are due to (a) the multifaceted nature of both the NEM and psychopathy constructs, such that different facets of NEM have differential associations with the facets of psychopathy, and (b) the presence of suppressor effects between the factor scores of the Psychopathy Checklist—Revised (PCL–R; Hare, 1991, 2003) in relation to NEM criterion measures.

We provide a comprehensive analysis of the relationship between facets of psychopathy as operationalized by PCL–R factor scores and several facets of NEM. In particular, we provide a systematic examination of the suppressor effects present between the PCL–R factor scores in the prediction of NEM outcomes. We demonstrate that suppression provides the analytic and conceptual framework needed to reconcile the centrality of NEM in clinical descriptions

of psychopathy with empirical investigations that use the PCL–R. Specifically, we demonstrate that PCL–R Factor 1 (F1) and Factor 2 (F2) exhibit mutually repulsive effects in the prediction of facets of NEM, wherein F1 is negatively associated with emotional distress (a similar but broader construct than trait anxiety) and fearfulness and is unrelated to anger–hostility, whereas F2 is positively associated with all facets of NEM.

Role of NEM in Psychopathy

In his classic monograph *The Mask of Sanity*, Cleckley (1941) discussed and included several manifestations of low emotional distress in his diagnostic criteria for psychopathy. For one, psychopathy can be distinguished from other psychiatric disorders in that suicide is rarely carried out (though Cleckley acknowledged that psychopaths may sometimes engage in manipulative suicidal gestures). Such resiliency is notable because of its rarity among psychiatric inpatients, and it implies a relative inoculation to the depressive symptoms that often accompany suicidal behavior. Consistent with this inference is Cleckley's contention that psychopathy entails a failure to experience the self-conscious emotions of guilt and shame (Tangney & Dearing, 2002), resulting in an interpersonal callousness and immunity to humiliation. Lack of emotional distress is also manifested as a lack of psychoneurotic disorder; that is, psychopaths are unlikely to manifest symptoms of anxiety disorders. Cleckley further contended that this lack of anxiety is more pervasive and includes a general attenuation of negative emotional reactivity to both intense and everyday stressors, such that psychopathy is characterized by an absence of nervousness, that is, low trait anxiety or trait emotional distress. In conjunction with this, Cleckley also considered strong anger reactions to be uncharacteristic of psychopaths. Such emotional imperturbability engenders the impression of superficial adjustment, making psychopathy uncommon in that it is characterized by a lack of the general emotional distress otherwise ubiquitous among psychiatric disorders.

Subsequent etiological theories also postulated that low NEM was central to psychopathy. Karpman (1941, 1948) proposed a taxonomy of psychopathic subtypes wherein a primary psychopathic subtype characterized by low anxiety and lack of conscience could be distinguished from a secondary psychopathic subtype characterized by heightened emotional distress, depression, and impulsivity. Lykken (1957, 1995) hypothesized that fearlessness was the primary psychological deficit in psychopathy, which in combination with poor rearing environments gave rise to the other symptoms of the disorder. Fowles (1980, 1987) applied the conception of a weak behavioral inhibition system (a hypothetical behavioral–brain system that underlies withdrawal and avoidance behavior) to account for the disinhibited behavior associated with primary psychopathy. Finally, Patrick and colleagues (Levenston, Patrick, Bradley, & Lang, 2000; Patrick, 1994, 2001), in press; Patrick, Bradley, & Lang, 1993) have demonstrated that psychopathic individuals exhibit attenuated defensive response to threatening and fearful stimuli, further implicating low NEM in the etiology of psychopathy.

Psychometric evidence of the link between psychopathy and NEM, however, has been less than robust and at times paradoxical, with some work indicating a positive association between psychopathy and NEM (cf. Hare, 2003). The dominant tool for assessing psychopathy is Hare's (1991, 2003) PCL–R. Though the PCL–R total score is purported to be an adequate index of overall psychopathy, items of the PCL–R exhibit a replicable two-factor structure:¹ F1 indexes the interpersonal and affective traits of psychopathy, whereas F2 encompasses the impulsive and antisocial behaviors characteristic of the disorder. The correlation between F1 and F2 is typically around .50. Of note, the PCL–R measurement procedures do not explicitly incorporate the assessment of low anxiety or fearlessness. However, an association between PCL–R scores and low NEM should be detected if (a) the hypothesis that psychopathy is associated with low NEM is correct and (b) the PCL–R is a valid measure of the psychopathy construct.

Most conceptions of psychopathy would predict that at least PCL-R total and F1 scores should be associated with low NEM. The empirical evidence for this hypothesis, however, is not impressive. Harpur, Hare, & Hakistan (1989) reported correlations between seven self-report measures of trait anxiety and the PCL-R. Trait anxiety was modestly negatively correlated with F1 (mean $r = -.21$, range $= -.12$ to $-.37$), but comparatively unrelated to the PCL-R total score (mean $r = -.10$, range $= .02$ to $-.30$) and F2 (mean $r = .03$, range $= .18$ to $-.14$). Shine and Hobson (1997) reported that F1 was negatively correlated with self-criticism whereas F2 was positively correlated with self-criticism, guilt, and several hostility scales. Hale, Goldstein, Abramowitz, Calamari, & Kosson (2004) detected a significant positive association between F2 and negative affect as measured by the Welsh Anxiety Scale (Welsh, 1956), whereas F1 was unrelated to negative affect. In a sample of female prisoners, Vitale, Smith, Brinkley, & Newman (2002) reported a positive association between negative affect and PCL-R total and F2 scores and a null association with F1 scores. In a fairly comprehensive test of the low NEM hypothesis, Schmitt and Newman (1999) failed to detect any significant negative associations between seven² self-report measures of NEM and the PCL-R total and factor scores in a large sample of male prison inmates.

However, evaluation of the association between measures of NEM and the PCL-R factors after controlling for their common variance (i.e., with the use of partial correlations) generally yields results more consistent with theory. Controlling for the overlap between the PCL-R factors, Patrick (1994) reported a negative association between F1 and measures of emotional distress, fearfulness, and trait negative affect and a positive association with trait positive affect, whereas F2 exhibited a positive association with emotional distress, fearfulness, anger, and trait negative affect and a negative association with trait positive affect. Using an omnibus personality inventory, Verona, Patrick, & Joiner (2001) found that F1 was negatively correlated with stress reaction and positively correlated with overall positive emotionality, whereas F2 was positively correlated with stress reaction, aggression, and overall negative emotionality and negatively correlated with overall positive emotionality. Finally, in a study of relations between psychopathy facets and anxiety in children, Frick, Lilienfeld, Ellis, Loney, & Silverthorn (1999) found that callous-unemotional traits were negatively associated with trait anxiety measures whereas impulsive-conduct problems were positively associated with such measures.

Suppressor Effects

When two correlated predictors exhibit opposing relations with a criterion variable, as is the case between the PCL-R factors and NEM, a suppressor situation may be present (for an excellent exposition on suppressor situations, see Paulhus, Robins, Trzesniewski, & Tracy, 2004). *Suppression* is defined here as occurring when the inclusion of two correlated predictor variables in the same regression model increases one or both validities (i.e., the beta coefficient for one or both predictor variables is greater than its bivariate or validity coefficient; Cohen & Cohen, 1975; Conger, 1974; Paulhus et al., 2004; Smith, Ager, & Williams, 1992).

¹Alternative three-factor (Cooke & Michie, 2001) and four-facet (Hare, 2003) models of the PCL-R have also been proposed, wherein F1 is parsed into Interpersonal and Affective facets and F2 is parsed into Impulsive Behavior and Antisocial Behavior facets. We limit our investigation to the traditional two-factor structure for the following reasons. First, the majority of previous research and validity evidence has been conducted on the two-factor model, and we wanted our results to be applicable to as broad a segment of the psychopathy literature as possible. Second, the primary thesis of the current investigation is that suppressor situations can reconcile inconsistencies between clinical descriptions of psychopathy and empirical investigations using the PCL-R. Given that goal, it is very difficult (both conceptually and analytically) to provide a concise and cogent illustration of the consequences of suppressor situations using more than two predictor variables.

²Although the Schmitt and Newman (1999) study included nine self-report measures, two of these measures (Harm Avoidance and Constraint) have been shown to be indicators of behavioral disinhibition rather than the emotional aspect of fear associated with NEM (Tellegen & Waller, 1992).

Recently, researchers have demonstrated that suppressor effects fall within the same intervening variable framework as mediating and confounding effects, wherein the impact of an initial predictor is partitioned into a direct and an indirect effect via a third variable (MacKinnon, Krull, & Lockwood, 2000; Shrout & Bolger, 2002). In this model, suppression occurs when the indirect effect of a predictor is opposite that of its direct effect. In other words, the indirect effect undermines or suppresses the direct effect. When this suppression is removed by entering the third (i.e., suppressor) variable into the model, the direct effect becomes a more valid indicant of the association between the predictor and criterion. One advantage of interpreting suppressor situations within the intervening variable framework is that statistical tests of mediation and spuriousness can also be applied to test the significance of suppressor effects (e.g., the Sobel test).

Suppressor situations are typically of two forms. *Cooperative or reciprocal suppression* occurs when the beta coefficients for both predictor variables are greater than their validity coefficients (Cohen & Cohen, 1975; Conger, 1974; Paulhus et al., 2004; Smith et al., 1992). *Crossover or net suppression* occurs when the beta coefficient of the initial predictor reverses sign, whereas the beta coefficient for the suppressor variable increases relative to its initial validity coefficient (Cohen & Cohen, 1975; Conger, 1974; Paulhus et al., 2004; Rosenberg, 1968). This is in contrast to *mediation*, wherein the inclusion of a second correlated predictor into the regression model decreases the validity coefficient of the initial predictor. Typically, the inclusion of two correlated predictors in the same regression model results in *redundancy*, wherein the beta coefficients of both predictors are less than their validity coefficients (Paulhus et al., 2004). Redundancy occurs because the shared variance between predictors also overlaps with the criterion. Suppression is the unique case in which the shared variance between the predictors is irrelevant to the criterion, and so its removal enhances the validity of each predictor.

Illustrative examples of suppression can be found in the PCL–R literature. Verona, Hicks, and Patrick (2005) detected a cooperative suppressor effect in evaluating the association between suicidal behavior and the PCL–R factors in female prisoners. In terms of bivariate associations, F1 exhibited a small negative ($r = -.12$) and F2 a medium positive ($r = .24$) association with a history of suicide attempts. When history of suicide attempts was predicted using both F1 and F2, however, the beta coefficients for both F1 ($\beta = -.32$) and F2 ($\beta = .40$) were greater than their validity coefficients. Additionally, each PCL–R factor demonstrated incremental validity over the other, indicating that the distinct personality constructs measured by F1 and F2 are both informative in understanding suicidal behavior. The previously cited studies that used partial correlations when examining the association between facets of psychopathy and NEM are also examples of cooperative suppressor effects.

Patrick, Hicks, Krueger, and Lang (2005) detected a crossover suppressor effect between the PCL–R factors and disinhibitory syndromes. A latent behavioral disinhibition or externalizing variable (Krueger et al., 2002) was operationalized as the covariance between the child and adult criteria of antisocial personality disorder and self-report measures of alcohol abuse, drug abuse, and disinhibited personality traits. Both F1 ($r = .44$) and F2 ($r = .84$) exhibited robust bivariate associations with the latent externalizing variable. Including both factors in the same predictive model, however, resulted in a reversal of the sign and attenuation of the effect size for F1 ($\beta = -.16$) and an increase in the validity of F2 ($\beta = .94$). As illustrated in this example, crossover suppression can be conceptualized as a special case of mediation and has also been referred to as a correction for distortion (Rosenberg, 1968), in that removal of the suppressing variance reveals the genuine associations between the predictors and criterion. Similar crossover suppressor effects between the PCL–R factors have also been detected in relation to symptoms of alcohol and drug dependence (Smith & Newman, 1990).

Suppressor situations are complex, and their interpretation is dependent on the theoretical framework that stipulates the hypothetical relationships between the predictors and criterion. Suppressor situations are important to identify, however, because they can reconcile what may appear to be inconsistency between theory and empirical observation. For example, the results of Verona et al. (2005) reconcile the clinical description of psychopaths as being at low risk for suicide with the empirical evidence that antisocial behavior so typical of psychopathy increases risk for suicidal behavior. Given the necessity of a theoretical framework to interpret suppressor situations, we next discuss the structure of NEM and its predicted relations with facets of psychopathy.

Structure of NEM and Facets of Psychopathy

NEM is conceptualized as individual differences in the propensity to experience unpleasant affective states—including emotions such as nervousness, worry, fear, sadness, guilt, irritability, anger, and contempt (Buss & Plomin, 1984; Watson & Clark, 1984, 1992). One perspective on the facet structure of NEM is embodied in the emotionality construct of Buss and Plomin's (1984) model of childhood temperament. These authors defined temperament traits as traits that are heritable, appear within the 1st year of life, exhibit temporal stability, and provide the basis for later personality development. In their model, the broad trait of emotionality refers to inherited differences in emotional arousal and the intensity of one's emotional experience. However, Buss and Plomin used this term only in reference to negatively valenced stimuli and responses, and they contended that only negative emotions produce the high levels of arousal necessary to meet their definition of a temperament trait. Thus, negative emotionality can be considered a more appropriate label for their dimension of emotional arousal and intensity.

According to Buss and Plomin (1984), NEM is initially expressed as *emotional distress*, the tendency to become upset easily and intensely when confronted with negative emotional stimuli, for example, the hassles and stressors of everyday life. Within the 1st year of life, distress differentiates into fear and anger, that is, instrumental tendencies to respond to threatening stimuli with either escape or attack. More broadly, the trait dimension of *fearfulness* is the tendency to experience a negative emotional state because of exposure to a threatening or noxious stimulus, and subsequent attempts or desire to escape from or avoid that stimulus (Buss & Plomin, 1984). The trait dimension *anger–hostility* is the tendency to respond to an aversive stimulus with feelings that range from irritation to annoyance to rage, followed by motivated behavior to aggress against the stimulus (Buss & Plomin, 1984; Spielberger, Jacobs, Russell, & Crane, 1983). In the present context, fearfulness refers only to the negative emotional experience of fear as opposed to the propensity to engage in risky or physically dangerous activities for the purpose of thrill seeking. This is because fear associated with the latter context is a facet of the higher order trait dimension of behavioral disinhibition rather than NEM (Tellegen & Waller, 1992).

Contemporaneous with Buss and Plomin's (1984) development of their childhood temperament model, Tellegen and colleagues (Tellegen, 1978/1982/1985; Tellegen & Waller, 1992) independently developed a temperament-based structural model of adult personality. Tellegen's model (Tellegen & Waller, 1992) includes 11 relatively distinct, lower order personality trait constructs whose interrelations yield three orthogonal higher order trait dimensions. Tellegen (Tellegen & Waller, 1992) interpreted two of these higher order trait dimensions, positive emotionality and negative emotionality, as having a direct link with temperament traits; that is, these dimensions reflected individual differences in the intensity of one's experience of positive and negative emotions, respectively. Tellegen and Waller's conception of NEM includes the lower order trait constructs of stress reaction and aggression, which closely correspond to the emotional distress and anger facets of Buss and Plomin's

emotionality dimension. Consistent with this conceptualization, Markon, Krueger, and Watson (2005) recently examined the meta-analytic factor structure of trait constructs assessed by several inventories of well-validated models of normal and abnormal personality and identified distinct but correlated dimensions of emotional distress and anger–hostility. Additionally, molecular genetic studies have linked facets of emotional distress and anger–hostility, further evidence of a broad, multifaceted NEM dimension (Jang et al., 2001).

Fearfulness is less well differentiated from emotional distress than anger–hostility, and most structural models of personality do not incorporate separate measures of fearfulness and emotional distress (even Buss & Plomin, 1984, reported a large correlation between fearfulness and emotional distress when developing an inventory for their temperament model). However, investigations into the comorbidity of disorders in the *Diagnostic and Statistical Manual of Mental Disorders—Fourth Edition (DSM–IV)* (American Psychiatric Association, 1994) provide support for distinguishable, though highly correlated, fearfulness and emotional distress dimensions. Specifically, confirmatory factor and behavior genetic analyses of *DSM–IV* disorders have identified a broad Internalizing dimension that accounts for the comorbidity among unipolar mood and anxiety disorders. This Internalizing dimension can be differentiated into highly correlated subfactors of *anxious–misery*, marked by major depression, dysthymia, and generalized anxiety disorder; and *fear*, marked by social phobia, simple phobia, panic, and agoraphobia (Kendler, Prescott, Myers, & Neale, 2003; Krueger, 1999; Vollebergh et al., 2001).

The tripartite model is another intensively researched and well-validated model designed to account for the comorbidity between depression and anxiety disorders (Brown, Chorpita, & Barlow, 1998; Clark & Watson, 1991; Mineka, Watson, & Clark, 1998). The model posits that a general dimension of negative affectivity accounts for the comorbidity between depression and anxiety disorders, whereas specific factors of low positive affect and autonomic hyperarousal account for the distinctive phenotypic expression of depression and anxiety disorders, respectively. Negative affectivity is roughly equivalent to the emotional distress dimension, and the specific autonomic hyperarousal factor distinguishes anxiety disorders that comprise the fearfulness dimension. However, low positive affect and depression are not well represented in our conceptual model of NEM. For this reason, we do not include such indicators in our primary analyses here. However, because of their relevance to the tripartite model and because limited data exist on associations between PCL–R psychopathy factors and depression, we include supplementary measures and analyses to elucidate these associations.

Given the multifaceted nature of both NEM and psychopathy, it is important to specify the predicted relations between particular facets of each. F1 is partly defined by a lack of deep emotional experience; therefore, F1 should be associated with a general diminution of emotional arousal across all the NEM facets. F1 also includes elements of grandiosity and narcissism, suggesting it would have especially strong inverse relations with the self-conscious and self-deprecating feelings of guilt and shame associated with depression. F2 is highly correlated with antisocial behavior and substance disorders, which are in turn strongly associated with anger, hostility, and aggression (Krueger, Caspi, Moffitt, Silva, & McGee, 1996; Sher & Trull, 1994). These disorders are also characterized by comorbid depression and mood instability, resulting in elevated scores on measures of emotional distress (Krueger et al., 1996; Sher & Trull, 1994). As fearfulness is defined by motivated behavior to escape or avoid a noxious stimulus, it is somewhat incompatible with the behavioral disposition to confront and attack a noxious stimulus that defines anger–hostility. However, people high in general emotional distress and mood instability are more likely to experience both fear and anger (Buss & Plomin, 1984). Therefore, F2 is likely to exhibit a modest positive association with fearfulness.

Current Study

In the current study, we used 11 self-report measures to assess the three aforementioned facets of NEM (distress, fear, and anger) and delineate their relationship with facets of psychopathy as measured by the PCL–R. A primary goal was to detect any suppressor situations that might be present between the PCL–R factors in their relations with different facets of NEM. We also undertook an empirical test of our three-facet model of NEM using structural equation modeling.

Structural equation modeling has several advantages. One is that it allows for the simultaneous estimation of the associations between the multiple NEM and psychopathy facets in the same model. Such a model provides a more accurate representation of the multivariate relations that the constructs actually operate within. In addition, the use of multiple measures to index latent variables has the methodological advantage of correcting for the attenuating effects of measurement error. Rarely discussed is that most investigations of the association between NEM and psychopathy have used self-report measures to index NEM and clinician ratings to measure psychopathy. This difference in mode of measurement likely underestimates the true associations between latent constructs and reduces power to detect significant effects—problems likely to be magnified if the true effect sizes are modest or if scores on the measuring instruments exhibit low reliability (Campbell & Fiske, 1959).

Method

Participants

Participants were 241 male inmates recruited from the population of the Federal Correction Institution in Tallahassee, Florida, a large medium security prison. Inmates who demonstrated conversational competency in English and the ability to read aloud a text description of the study were scheduled for further participation and supplied written informed consent. The racial and ethnic composition of the sample was 46.9% ($n = 113$) White non-Hispanic, 39.8% ($n = 96$) African American, 12.9% ($n = 31$) Hispanic, and 0.4% ($n = 1$) other. The mean age of the sample was 32.7 years ($SD = 7.7$, range = 19–57 years).

Assessment

Psychopathy—Psychopathy was assessed via ratings on the PCL–R. Ratings were based on information gathered from a semistructured clinical interview and review of prison file information. Interviewers were either bachelor's or master's level psychology students who received specialized training in administration and scoring of the PCL–R from the second author. All interviews were videotaped and rated by a second diagnostician on the basis of the interview and file information. The mean of the two raters was used for the participants' total and factor scores. Though not fully independent tests of reliability due to ratings based on video recordings rather than conducting a separate interview, interrater reliability as determined by the intraclass correlation coefficients for PCL–R total, F1, and F2 scores were .95, .91, and .94, respectively. The mean PCL–R total, F1, and F2 scores were 21.2 ($SD = 7.3$), 9.0 ($SD = 3.4$), and 9.2 ($SD = 3.7$), respectively.

Negative emotionality—We used various self-report instruments to assess the following facets of NEM: general emotional distress, fearfulness, and anger–hostility. Measures of these facets were primarily drawn from the self-report inventories of major structural models of temperament, personality, and mood, including the Emotionality–Activity–Sociability Temperament Survey (EAS; Buss & Plomin, 1984), the NEO Five-Factor Inventory of personality (FFI; Costa & McCrae, 1992), the Multidimensional Personality Questionnaire (MPQ; Tellegen & Waller, 1992), and the Positive and Negative Affect Schedule (PANAS;

Watson, Clark, & Tellegen, 1988). In addition to scales imbedded in these broadband inventories, we also used ancillary measures designed to assess particular facets of NEM, including the Fear Survey Schedule—III (FSS—III; Arrindell, Emmelkamp, & van der Ende, 1984), the Fear Questionnaire (Marks & Mathews, 1979), and the Anger Expression Questionnaire (AEQ; Spielberger, Krasner, & Solomon, 1988). Table 1 provides the scale names, internal consistency coefficients (i.e., Cronbach's alpha), and a brief description of the content assessed by each scale.

Emotional distress was assessed with the EAS Distress, FFI Neuroticism, MPQ Stress Reaction, and the PANAS Negative Affect scales. Fearfulness was assessed with the EAS Fearfulness scale and total scores for the FSS—III and the Fear Questionnaire. Anger–hostility was assessed with the EAS Anger, FFI Antagonism (reversed Agreeableness), and MPQ Aggression scales and with the total score for the AEQ. For supplementary analyses, depression was assessed with the Beck Depression Inventory (BDI; Beck, Ward, Mendelson, Mock, & Erbaugh, 1961) and PANAS Positive Affect scale. The number of participants with data for a given measure ranged from 107 to 241. Little's (1988) test of data missing completely at random failed to detect any bias to the patterns of missing data, $\chi^2(158, N = 241) = 146.15, p = .74$.

Data Analysis

First, we examined the latent structure of NEM by testing a series of confirmatory factor analysis models designed to empirically evaluate our conceptual organization of NEM as correlated facets of emotional distress, fearfulness, and anger–hostility. These models ranged from a broad one-factor model of NEM to a correlated three-factor model. Models were fit to the raw data via maximum likelihood estimation, an estimation procedure that allows for missing data, in the computer program *Mplus 2.02* (Muthén & Muthén, 2001). Model fit was evaluated with the chi-square fit statistic, the root-mean-square error of approximation (RMSEA), the standardized root-mean-square residual (SRMR), and the sample-size adjusted Bayesian Information Criterion (BIC_{adj} ; $\chi^2 - df \ln N^*$, where $N^* = (N + 2)/24$; Schwartz, 1978; Sclove, 1987). The chi-square and RMSEA provide overall estimates of model fit, with the RMSEA providing an index of the discrepancy in model fit per degree of freedom. The SRMR is an index of the average discrepancy between the model-estimated statistics and observed sample statistics. RMSEA and SRMR values less than .08 indicate a good fit to the data, whereas values less than .05 indicate a very good fit. Negative BIC_{adj} values indicate a good fit to the data, with more negative BIC_{adj} values indicative of better fit.

Next, we examined relations between facets of NEM and psychopathy using structural equation modeling by including the PCL–R factors in the measurement model as predictors of the latent NEM variables. The primary conceptual difference between this structural model and standard linear regression is that the criterion variable is a latent variable rather than a single observed variable. Additionally, we sought to identify any suppressor effects between the two PCL–R factors in relation to the latent NEM variables. Suppressor effects were detected by regressing each latent NEM variable on each PCL–R factor—first alone, and then jointly. A suppressor effect would be present if the beta coefficient for either PCL–R factor increased after the inclusion of the other PCL–R factor in the model.

The Sobel test (z) was used to evaluate the significance of any suppressor effects. The Sobel test provides an index of the magnitude of the change in the beta coefficient for a predictor variable after entry of another predictor variable into the structural model. We calculated Sobel test statistics using a publicly available macro at <http://www.unc.edu/~preacher/sobel/sobel.htm>. The incremental validity of each PCL–R factor over the other factor was evaluated using the change in the multiple correlation squared (R^2). We also tested whether the beta coefficients differed significantly from one another when

both PCL–R factors were entered into the same structural model by constraining the beta coefficients to be equal and then examining the change in model fit using the chi-square fit statistic.

Results

Measurement Model of Negative Emotionality

We examined the latent structure of NEM by fitting a series of confirmatory factor models to the covariance matrix of the 11 self-report measures of emotional distress, fearfulness, and anger–hostility. Examination of the residuals revealed excessive within-inventory overlap for the EAS Distress and Anger scales. Therefore, for each model tested, the residual variances for these two scales were allowed to correlate ($r = .15, p < .01$).

The first model we tested was a one-factor model of NEM hypothesizing that a single factor could best account for the covariance among the 11 measures. As reported in Table 2, this model provided a poor fit to the data, as indicated by high RMSEA, SRMR, and BIC_{adj} values. The next model we tested hypothesized a distinct Anger–Hostility factor (defined by loadings on EAS Anger, FFI Antagonism, MPQ Aggression, and the AEQ) that was correlated with a general Emotional Distress factor (defined by loadings on the remaining seven NEM measures). This model provided an adequate overall fit to the data, as indicated by its low RMSEA and SRMR values, and a significantly better fit to the data than the one-factor model on the basis of the likelihood ratio test, $\Delta\chi^2(1, N = 241) = 127.50, p < .01$. Next, we fit a correlated three-factor model that included the Anger–Hostility factor, a Fearfulness factor (defined by loadings on EAS Fearfulness, FSS–III, and Fear Questionnaire), and an Emotional Distress factor (defined by loadings on EAS Distress, FFI Neuroticism, MPQ Stress Reaction, and PANAS NA). This model provided a good overall fit to the data as indicated by its low RMSEA and SRMR values and negative BIC_{adj} value and a significantly better fit to the data than the three-factor model, $\Delta\chi^2(2, N = 241) = 19.64, p < .01$.

We also examined the association between depression and the facets of NEM by constructing a latent depression variable using the BDI and PANAS Positive Affect scales (factor loadings = .69 and -.61, respectively). The latent depression and emotional distress variables were highly correlated ($r = .86, p < .01$), and a four-factor model of NEM that included a distinct depression facet failed to provide a better fit than a three-factor model (details available from the authors on request). Because of this lack of parsimony, depression was not included in our model of negative emotional temperament, but we do provide supplementary analyses delineating the association between the PCL–R factors and the latent depression variable.

Figure 1 provides the parameter estimates for the correlated three-factor model of NEM. Our results are consistent with those reported by Buss and Plomin (1984) in the development of the EAS, that is, a large correlation between emotional distress and fearfulness, a moderate-to-large correlation between emotional distress and anger–hostility, and a moderate correlation between anger–hostility and fearfulness. Substantively, the results are also consistent with Buss and Plomin's conception of a NEM dimension characterized by individual differences in susceptibility to general emotional distress that can be further differentiated into tendencies toward fear or anger.

Structural Equation Modeling of the Relations Between the PCL–R Factors and Facets of Negative Emotionality

Finally, we sought to delineate the relations between facets of NEM and psychopathy using structural equation modeling wherein the latent NEM facets were criterion variables and the PCL–R factors were predictor variables. To detect suppressor effects, we entered each PCL–

R factor alone into the correlated three-factor measurement model of NEM as a predictor of each NEM facet. Next, the PCL–R factors were entered simultaneously as predictors of the latent NEM facets. Table 2 provides the model fitting results when entering F1 alone, F2 alone, and the factors jointly as predictors of the three latent NEM facets. In each case, the model provides a good fit to the data as evinced by the low RMSEA, SRMR, and BIC_{adj} values. We conducted separate analyses to examine relations between the PCL–R factors and depression.

Parameter estimates for the structural relations between the PCL–R factors and latent NEM facets are provided in Table 3. Entered alone, F1 exhibited a significant negative association with the latent fearfulness variable, a nonsignificant negative association with the latent emotional distress variable, and a significant positive association with the latent anger–hostility variable. Entered alone, F2 exhibited a significant positive association with the latent anger–hostility and emotional distress variables and a non-significant positive association with the latent fearfulness variable.

The correlation between PCL–R F1 and F2 was .51 ($p < .01$), which is consistent with other values reported in the literature (cf. Hare, 2003). When both F1 and F2 were entered in the model, cooperative suppressor effects (i.e., the beta coefficients increased for both F1 and F2) were detected for the latent emotional distress and fearfulness variables. Using the Sobel test, we found a significant increase in the negative structural associations between F1 and emotional distress and fearfulness after inclusion of F2 in the model. For F2, there was a significant increase in its positive associations with the latent emotional distress and fearfulness variables after the inclusion of F1 in the model. As determined by the change in R^2 , both F1 and F2 exhibited incremental validity over the other in the prediction of emotional distress and fearfulness.

A crossover suppressor effect (i.e., a change in the sign of the initial predictor and an increase in the beta coefficient of the suppressor variable) was detected between the PCL–R factors and the latent anger–hostility variable. Using the Sobel test, we found a significant change in the structural association between F1 and anger–hostility, reversing from a small but significant positive association to a nonsignificant negative association. Conversely, there was a nonsignificant increase in the positive association between F2 and the latent anger–hostility variable. As determined by the change in R^2 , F2 exhibited incremental validity over F1, but F1 failed to provide incremental validity over F2 in the prediction of anger–hostility.

For the latent depression variable, at the bivariate level F1 exhibited a significant negative association and F2 exhibited a significant positive association. When both F1 and F2 were entered into the same structural model, a cooperative suppressor effect was detected. Using the Sobel test, we found a significant increase in the negative association with F1 and a significant increase in the positive association with F2. As determined by the change in R^2 , both F1 and F2 exhibited incremental validity over the other in the prediction of depression. As determined by the change in the χ^2 fit statistic, the structural associations for F1 and F2 were significantly different from each other for all the latent NEM facets and depression.

Perhaps the most revealing statistics are the R^2 when using the PCL–R total score to predict the three NEM facets and the depression variable compared with using F1 and F2 as separate predictors. The PCL–R total score was only informative in the prediction of anger–hostility and exhibited virtually no predictive power for emotional distress, fearfulness, and depression. However, when the same information was entered into the model with F1 and F2 scores included as separate predictors, the psychopathy facets evinced a large effect size in the prediction of all the NEM facets and depression, including a substantial improvement in the prediction of anger–hostility. This analysis demonstrates that the PCL–R factors index distinct personality constructs that have opposing and repulsive relations with negative emotionality

outcomes, and their full predictive power is only realized when their common, irrelevant variance is removed (though the common variance might be useful in predicting other outcomes).

Discussion

In the current study, the two broad factors of the PCL–R exhibited diverging relations with various facets of NEM, and in all cases the divergence was amplified when the two factors were entered simultaneously into a predictive model. For two of the three NEM facets (emotional distress and fearfulness), cooperative suppressor effects were observed—in which relations for both PCL–R factors increased, in opposing directions, when the two were used concurrently as predictor. For the third NEM facet that we assessed (anger–hostility), a crossover or net suppressor effect was evident—in which simultaneous entry of the two PCL–R factors as predictors resulted in a change in the direction of association for F1 (i.e., from a significant positive to a nonsignificant negative association) and a nonsignificant increase in the positive association for F2. Furthermore, for all three NEM facets, prediction based on the two PCL–R factors was superior to that based on PCL–R total scores alone. Indeed, for emotional distress and fearfulness, PCL–R total scores provided negligible predictive power, whereas concurrent use of the two PCL–R factors yielded significant prediction.

Practical Implications: Prediction of Aggression, Suicide, and Treatment Response

These results, which replicate and extend prior findings (e.g., Hale et al., 2004; Harpur et al., 1989; Verona et al., 2001; Vitale et al., 2002), are of both practical and theoretical importance. From a practical standpoint, our findings encourage concurrent use of the two PCL–R factors in predicting criterion measures in the realm of negative emotionality and potentially other domains. Relations between psychopathy and NEM are of practical importance because NEM is central to a range of clinical phenomena. Three such phenomena of obvious relevance to criminal offenders are aggression, suicide, and amenability to treatment.

With regard to aggression, our findings for measures of anger–hostility suggest that use of the two PCL–R factors in tandem could improve prediction of a particular form of aggression thought to be mediated by NEM, namely, reactive (angry) aggression (Berkowitz, 1990; Moyer, 1968; Verona, Patrick, & Lang, 2002). In the current study, the use of the two PCL–R factors enhanced prediction of anger–hostility over the use of PCL–R total scores because the unique variance in F1 showed a weak negative association with measures of anger–hostility, whereas the unique variance in F2 strongly (+) predicted such measures. In parallel with this, there is evidence for differential associations between the two PCL–R factors and aggressive acts that might be construed as reactive. For example, using data on 1,136 civil psychiatric patients from the MacArthur Violence Risk Assessment Project, Skeem and Mulvey (2001) reported a moderate effect for F2 ($\beta = .25$) and a very small effect for F1 ($\beta = .07$) in the prediction of violent and aggressive behavior. Patrick, Zempolich, and Levenston (1997) reported correlations of $+.24$ to $+.40$ for F2 (after controlling for F1) and $-.03$ to $-.13$ for F1 (after controlling for F2) with measures of assaultiveness and fighting derived from official criminal records and clinical interviews in a sample of male prison inmates. It is interesting that differential relations have also been reported between the two PCL–R factors and proactive (instrumental) aggression—but in this case, F1 is more strongly (+) predictive (Cornell et al., 1996; Woodworth & Porter, 2002). However, limitations of this existing research include imprecision in the subtyping of aggression (e.g., assaults and fights do not invariably entail anger) and the possibility of criterion contamination (i.e., reliance on aggressive behaviors in the scoring of some PCL–R items). Further research is needed in which motives and affective states are assessed in connection with aggressive acts and aggression is assessed in isolation from ratings of psychopathy.

With regard to suicide, Verona et al. (2005) reported a cooperative suppressor effect in the prediction of past suicide attempts among female offenders, with associations for both PCL–R F1 (–) and F2 (+) increasing when the two were entered concurrently as predictors in a regression model. As we found for measures of depression, anxiety, and fear in the current study, PCL–R total scores showed a negligible relationship with suicide history. Moreover, Verona et al. (2005) reported that NEM played a mediating role in the positive association between suicide and PCL–R F2 (see also Verona et al., 2001). This work provides a further illustration of the practical value of using the two distinct facets of PCL–R to predict maladaptive behaviors associated with NEM.

The current findings also have implications for the prediction of treatment responsiveness. Cleckley (1941) characterized psychopathic individuals as generally unresponsive to treatment because they lack the underlying psychological discomfort and distress that serve as an impetus for change; he noted that psychopaths typically enter treatment in response to external pressures (e.g., court referral; insistence of family or friends) rather than seeking it out themselves. The perspective that psychopathy is recalcitrant to treatment has persisted to the present day (e.g., Harris & Rice, 2006). However, the current findings suggest that the two major facets of psychopathy indexed by the PCL–R are differentially related to the psychological distress that Cleckley and others view as a crucial motivator for change. To this extent, we expect that concurrent use of the two factors to predict change associated with interventions that focus on the experience and expression of negative affect would improve prediction over reliance on PCL–R total scores. As an example, in line with the above-noted points regarding aggression, we expect that outcomes of treatments that focus on anger management (e.g., Novaco, 1975; Novaco, Ramm, & Black, 2000) would be predicted better by using the two PCL–R factors in tandem rather than relying on overall PCL–R scores.

Theoretical Implications for Psychopathy

In addition to their practical importance, the current findings also have implications for the conceptualization and assessment of psychopathy. Paulhus et al. (2004) noted that detection of suppressor effects is important because it helps to reconcile disparities between theory and empirical observations obtained for a particular assessment instrument. In the present case, the identification of suppressor effects for the two PCL–R factors helps to reconcile the strong theoretic emphasis that Cleckley placed on absence of nervousness and “psychoneurotic features” (i.e., anxious or depressive symptomatology) in psychopathy with the observed null association between overall PCL–R scores and NEM measures. It is not the case that PCL–R psychopathy is unrelated to NEM; rather, it is the case that the two distinct factors of the PCL–R relate differentially to NEM.

More fundamentally, the presence of suppressor effects, in particular *cooperative* suppressor effects, signifies the presence of highly distinctive underlying constructs embedded within a common measurement instrument (Paulhus et al., 2004). Elsewhere, we have argued that the PCL–R taps two distinctive entities—one corresponding phenotypically to low stress reaction and an agentic interpersonal style and genotypically to a core weakness in defensive (fear) reactivity, and the other phenotypically to an impulsive–aggressive (externalizing) behavioral style and genotypically to a basic weakness in inhibitory control systems (Patrick, 2001, in press; see also Fowles & Dindo, 2006). Consistent with this interpretation is research showing that individuals selected to be very high on one of the PCL–R factors but low on the other show dramatically different patterns of physiological reactivity to emotional stimuli (e.g., Patrick, 1994; Verona, Patrick, Curtin, Bradley, & Lang, 2004). In addition, recent research indicates that individuals with generally high scores on the PCL–R (i.e., diagnosed as psychopaths) can be classified on the basis of personality profiles into a low-anxious agentic subgroup and an impulsive–aggressive subgroup (Hicks, Markon, Patrick, Krueger, & Newman, 2004). The

results of the current investigation dovetail nicely with these previous findings and indicate that the suppressor effects are due to a mixture of subpopulations within incarcerated PCL–R scorers that represent opposite ends of the NEM dimension. This body of evidence suggests a dual process model of psychopathy, wherein persons with distinct temperament styles exhibit overlapping behavioral pathology.

What might account for the representation of such distinctive constructs within the PCL–R? Our perspective is that the PCL–R represents an effort to capture an inherently multidimensional construct within a single, putatively unidimensional measurement instrument (see Patrick, 2006). Cleckley (1941) described psychopathy as a paradoxical clinical entity in which severe behavioral maladjustment was “masked” by a veneer of positive social and psychological adjustment. His 16 diagnostic criteria for the disorder included explicit indicators of positive psychological adjustment not included in the PCL–R (e.g., good intelligence, absence of delusions–irrationality, absence of nervousness or “psychoneurotic” symptoms, and suicide rarely carried out), in addition to indicators of affective–interpersonal and behavioral deviance included in the PCL–R. Although it is somewhat unclear from the information provided in the manual for the PCL–R (Hare, 1991, 2003) and earlier published reports (e.g., Hare, 1980) what precise criteria were used to select items for the PCL–R, these sources indicate that items were retained if they discriminated low versus high psychopathy groups defined on the basis of global ratings (i.e., reflecting degree of match with Cleckley’s description) and if they showed good psychometric properties. By this, we presume that items were selected that added to the coherency (i.e., internal consistency) of the overall scale as well as providing discrimination between individuals with high and low Cleckley global ratings.

Presumably as a consequence of selecting items to tap a putatively unitary construct, the PCL–R items as a whole are strongly oriented toward deviance and maladjustment. In particular, the items of Factor 1 can be seen as reflecting the affective–interpersonal features of psychopathy in their more deviant forms: insincere charm; inflated ego; lying and manipulation; and lack of remorse, empathy, or deep emotion. Missing from the PCL–R are the purer indices of good adjustment and resiliency that Cleckley emphasized—including the distinct absence of nervousness that appeared as a prominent feature in so many of his clinical case illustrations. Thus, it may well be the case that the PCL–R taps a more unitary construct than what Cleckley had in mind. Nonetheless, the data of the present study indicate that when considered separately from the social deviance tapped by F2, the unique variance in F1 captures something of the lack of anxiety and fear that Cleckley viewed as central to the psychopathy construct.

The current findings also highlight the variegated nature of the NEM construct itself. Although anxiousness, fear, and anger are interrelated phenomena (thought to be mediated at some level by a common defensive system, e.g., Lang, Bradley, & Cuthbert, 1990; Mineka et al., 1998; Watson & Clark, 1984), they nevertheless show distinctive relations with external criterion measures (cf. Clark & Watson, 1991; Watson & Clark, 1992). In the current study, the most notable divergence was for anger–hostility in relation to the other NEM variables. Anger–hostility was the only facet of NEM that showed a reliable association with overall PCL–R scores. Moreover—in contrast with emotional distress and fearfulness, as well as depression, which all showed opposing relations with the two PCL–R factors (negative with Factor 1, positive with Factor 2)—anger showed positive associations with both PCL–R factors, although the association for F1 became null after accounting for its overlap with F2. This pattern of results likely reflects the fact that anger–hostility taps a more active (agentic) form of negative affectivity (cf. Buss & Plomin, 1984; Harmon-Jones & Allen, 1998) that is more compatible with the PCL–R psychopathy construct as a whole than other facets of NEM.

Certain limitations of the current study should be noted. One is the relatively small number of observations for some of the NEM scales. Other concerns are the limitations to generalizability

inherent in using an incarcerated sample, reliance on a single measure of psychopathy and whether the suppressor effects are limited to the PCL–R conception of psychopathy, and sole reliance on self-report to assess NEM.

However, studies that have used community samples and self-report measures of psychopathy, such as Levenson's Self-Report Psychopathy scales (LSRP; Levenson, Kiehl, & Fitzpatrick, 1995) and Lilienfeld's Psychopathic Personality Inventory (PPI; Lilienfeld & Andrews, 1996) suggest that our results are robust to these limitations. For example, McHoskey, Worzel, and Szyarto (1998) demonstrated cooperative suppressor effects between the primary and secondary psychopathy scales of the LSRP (conceptually similar to PCL–R F1 and F2 and correlated with one another at .50 to .60) in the prediction of several measures of NEM across three studies with undergraduate samples. Using the PPI or MPQ-estimated PPI scores, Benning and colleagues (Benning, Patrick, Blonigen, Hicks, & Iacono, 2005; Benning, Patrick, Hicks, Blonigen, & Krueger, 2003) demonstrated phenotypic links consistent with the present study between factors of the PPI that correspond to PCL–R F1 and F2 and several measures of NEM in both community and incarcerated samples (however, the orthogonal structure of the PPI factors precluded suppressor effects). Additionally, Blonigen, Hicks, Krueger, Patrick, & Iacono (2005) extended these links to the genetic level using *DSM–IV* symptoms of depression and anxiety disorders and MPQ-estimated PPI scores in a large community twin sample. The cumulative evidence, therefore, indicates that despite limitations to the present study, the suppressor effects and differential associations detected between facets of psychopathy and NEM are robust across varying samples, methods of measurement, and conceptions of psychopathy.

In summary, the current findings suggest that, although developed to index a unitary psychopathy construct, the PCL–R nevertheless includes distinguishable facets that exhibit differing relations with various components of negative affectivity. Our findings demonstrate that separating these facets of psychopathy can significantly improve prediction of criterion variables in the realm of NEM—and perhaps, by extension, affiliated clinical phenomena such as reactive aggression, suicidal behavior, and treatment effectiveness. We encourage further research aimed at isolating distinctive elements of the psychopathy construct and exploring their unique predictive associations with important criterion variables, as well as their unique etiologic underpinnings.

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Figure 1.

Measurement model of negative emotionality ($N = 241$). FFI = Five-Factor Inventory; EAS = Emotionality–Activity–Sociability Temperament Survey; MPQ = Multidimensional Personality Questionnaire; PANAS = Positive and Negative Affect Schedule; NA = Negative Affect; AEQ = Anger Expression Questionnaire; FSS–III = Fear Survey Schedule—III. FFI Antagonism is reversed Agreeableness. The residual variances of the scales in italics were allowed to covary. All factor loadings and latent correlations are significant at $p < .01$.

Table 1
Self-Report Measures of Facets of Negative Emotionality

Scale	α	Content assessed
EAS Distress (4 items, $n = 180$)	.74	Prone to feel distressed, upset, frustrated
NEO-FFI Neuroticism (12 items, $n = 180$)	.79	Anxiousness, anger–hostility, depressiveness, self-consciousness, vulnerability
MPQ Stress Reaction (26 items, $n = 241$)	.90	Prone to worry; sensitive; easily upset or irritable; guilt prone
PANAS Negative Affect (10 items, $n = 182$)	.84	Mood adjectives of various forms of distress, for example, upset, guilty, nervous, ashamed
EAS Fearfulness (4 items, $n = 180$)	.62	Prone to fear and panic; number of fears; feelings of insecurity
Fear Survey Schedule (52 items, $n = 190$)	.94	Ratings of intensity of fear in relation to various objects and situations
Fear Questionnaire (15 items, $n = 107$)	.86	Symptoms of agoraphobia, blood-injury phobia, and social phobia
Anger Expression Questionnaire (20 items, $n = 181$)	.78	Inward and outward expression of anger; ability to control anger
EAS Anger (4 items, $n = 180$)	.60	Temper; prone to annoyance and anger
NEO-FFI Antagonism (12 items, $n = 180$)	.70	Mistrusting, deceptive, exploitive, oppositional, combative, arrogant, callous
MPQ Aggression (20 items, $n = 241$)	.82	Competitive; intimidates others; seeks revenge for perceived transgressions
Beck Depression Inventory (21 items, $n = 112$)	.86	Various symptoms of depression, for example, sadness, lack of pleasure, guilt, pessimism, low self-esteem
PANAS Positive Affect (10 items, $n = 181$)	.84	Mood adjectives of various forms of positive activation, for example, inspired, excited, active

Note. EAS = Emotionality–Activity–Sociability Temperament Survey; FFI = Five-Factor Inventory; MPQ = Multidimensional Personality Questionnaire; PANAS = Positive and Negative Affect Schedule. FFI Antagonism is reversed Agreeableness.

Results of Model Fitting for Measurement Model of Negative Emotionality (NEM) and Structural Models of PCL-R Factors and Facets of NEM

Description of model	χ^2	df	RMSEA	SRMR	BIC _{adj}
Measurement models of NEM					
One-factor: Single NEM dimension	227.69	43	.133	.107	128.14
Two-factor: Correlated Anger-Hostility and Emotional Distress factors	100.19	42	.076	.069	2.96
Three-factor: Correlated Fearfulness, Anger-Hostility, and Emotional Distress factors	80.55	40	.065	.052	-12.15
Structural equation models of PCL-R factors and facets of NEM					
PCL-R Factor 1 as single predictor of three-factor model of NEM	88.07	48	.059	.051	-23.05
PCL-R Factor 2 as single predictor of three-factor model of NEM	85.91	48	.057	.050	-25.21
PCL-R Factors 1 and 2 as predictors of three-factor model of NEM	93.86	56	.053	.049	-35.78

Note. $N = 241$. PCL-R = Psychopathy Checklist—Revised; χ^2 = chi-square goodness-of-fit statistic; RMSEA = root-mean-square error of approximation; SRMR = standardized root-mean-square residual; BIC_{adj} = Sample-size adjusted Bayesian Information Criterion.

Structural Relations and Suppressor Effects Between PCL-R Factors and Latent Emotional Distress, Fearfulness, Anger-Hostility, and Depression Variables

Table 3

Latent criterion variable	Factor 1				Factor 2				$\Delta\chi^2(1)$			
	β PCL-R total	R^2 PCL-R total	R^2 F1 and F2	β alone	β with F2	Sobel test (z)	ΔR^2	β alone		β with F1	Sobel test (z)	ΔR^2
Negative emotionality												
Emotional distress	.13	.02	.17***	-.10	-.33	4.53***	.16***	.29***	.45***	-3.72***	.08***	34.9***
Fearfulness	-.04	.00	.09***	-.21*	-.34	2.31*	.05***	.07	.24*	-2.99**	.09***	13.0***
Anger–hostility	.39***	.15***	.25***	.18*	-.09	4.58***	.22***	.49***	.53***	1.13	.01	19.3***
Depression	.04	.00	.20***	-.22*	-.45	3.32***	.15***	.23*	.45***	-3.51***	.15***	22.5***

Note. $N = 241$. PCL-R = Psychopathy Checklist-Revised; F1 = Factor 1; F2 = Factor 2; $\Delta\chi^2(1)$ = change in the chi-square goodness-of-fit statistic on one degree of freedom. The Sobel test provides an index of the change in the beta coefficient of a predictor variable after entry of another predictor into the regression model. A significant Sobel z value indicates there is a significant change in the beta coefficient of the initial predictor. The $\Delta\chi^2(1)$ refers to the change in model fit after constraining the beta coefficient of Factor 1 and Factor 2 in the structural equation model to be equal. A significant $\Delta\chi^2(1)$ indicates the beta coefficients are significantly different from each other.

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