



# Modification of the startle reflex in a community sample: do one or two dimensions of psychopathy underlie emotional processing?

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## Abstract

Recent research on psychopathy has begun to explore two dimensions that possibly underlie psychopathy—one related more to emotional and interpersonal traits, and another related more to antisocial behaviors. A community sample of adults was assessed for psychopathy using Hare's (1991) Psychopathy Checklist-Revised (PCL-R). Eyeblinks elicited by startle probes were recorded while participants viewed pictures of emotionally-laden stimuli. Consistent with previous research, participants scoring high on PCL-R Factor 2 ("antisocial") showed no affective modification of startle if they also scored high on PCL-R Factor 1 ("emotional detachment"). When the factor scores were analyzed together as continuous variables in a regression analysis, however, affective modification of startle was negatively related to Factor 1 but positively related to Factor 2. The results thus provide further support for a two-factor model of psychopathy.

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## 1. Introduction

Psychopathy is a personality disorder distinguished by distinct emotional and interpersonal traits and deviant social behaviors. Recent empirical and conceptual work has made use of Hare's

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Psychopathy Checklist-Revised (PCL-R; 1991), a 20-item measure that has a two-factor solution. Factor 1 measures core personality traits associated with psychopathy, such as grandiosity, glibness, and a lack of empathy, whereas Factor 2 measures more self-defeating and antisocial behaviors, such as poor behavioral controls, juvenile delinquency, and irresponsibility. Patrick, Bradley, and Lang (1993) have labeled Factor 1 “emotional detachment” and Factor 2 “antisocial behavior.” Others have argued that the two factors appear to map onto the distinction Karpman (1941) made between primary and secondary psychopaths (McHoskey, Worzel, & Szyarto, 1998).

The PCL-R is frequently used with incarcerated samples, but rarely with non-incarcerated samples, despite the greater external validity such studies might provide (see Lilienfeld, 1994, for a review). Regardless of the kind of sample, most researchers have focused on the total PCL-R score. However, differentiating the two factors that underlie psychopathy may have implications for assessing relations between psychopathy and other personality variables (Harpur, Hare, & Hakstian, 1989). For example, Patrick (1994) administered the PCL-R as well as the trait form of the Positive and Negative Affect Schedule (PANAS; Watson, Clark, & Tellegen, 1988), and the Emotionality-Activity-Sociability (EAS) Temperament Survey (Buss & Plomin, 1984) to a sample of male prisoners. Patrick computed partial correlations between each PCL-R factor with the other variables, while holding the other PCL-R factor constant. As expected, PCL-R Factor 1 scores were negatively related to the distress and fear subscales of the EAS, and to the negative affect subscale of the PANAS. However, more surprisingly, PCL-R Factor 2 scores were *positively* related to these same subscales. Using different measures of affect and a two-dimension model of psychopathy, similar relationships have also been found in incarcerated adults (Harpur et al., 1989), college students (McHoskey et al., 1998), and children (Frick, Lilienfeld, Ellis, Loney, & Silverthorn, 1999).

In the present study, we examined the relationships between the two PCL-R factors and a psychophysiological measure, modification of the startle reflex. Several investigators have demonstrated that the affective modification of the startle eyeblink reflex is a useful method to study emotional processes in humans and other animals (for reviews of this literature, see Bradley, Cuthbert, & Lang, 1999; Davis, Walker, & Lee, 1999). In a common paradigm with humans, participants view an affect-laden picture, such as a snake or an attractive nude model, during which there is a presentation of a loud, startling burst of white noise. The amplitudes of startle blinks that occur when the participant is viewing a negative picture are generally greater than when the picture is neutral or positive. This affective modification of startle is more likely to occur when the participant has had sufficient time to process the stimulus (i.e. greater than 1 s), although it can occur at lead intervals as short as 250 ms, depending on the task requirements (Vanman, Boehmelt, Dawson, & Schell, 1996). According to Lang and his colleagues (Lang, 1995; Lang, Bradley, & Cuthbert, 1997), this startle modification effect reflects an “affect match,” in that the startle reflex, which has a negative valence, is enhanced during a negatively valenced foreground stimulus (e.g. a picture of a burn victim), but diminished during a positively valenced one (e.g. a picture of beautiful scenery).

Patrick et al. (1993) examined the relationships of the PCL-R with startle modification with a sample of incarcerated participants. Participants viewed emotionally evocative and neutral pictures during which acoustic probes occurred between 4.5 and 6.5 s after picture onset. In one set of analyses, Patrick et al. used the total PCL-R score to form three equal groups: nonpsychopaths

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