Interview Assessment of Boldness:
Construct Validity and Empirical Links to Psychopathy and Fearlessness

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Dedication

For Lien, my primary advisor in life; and for Evan, my primary reason for living. This work is dedicated to both of you.

Abstract

The triarchic model of psychopathy (Patrick, Fowles, & Krueger, in press) conceptualizes this intriguing disorder in terms of three distinct elemental phenotypes: *disinhibition*, reflecting tendencies toward deficient behavioral control and externalizing psychopathology; *meanness*, reflecting deliberate cruelty and agentic exploitation of others; and *boldness*, reflecting resilience to life stress, calmness in the face of threat, and social dominance. The predominant instrument for assessing criminal psychopathy, Hare's (1991, 2003) Psychopathy Checklist-Revised (PCL-R), appears to tap the disinhibition and meanness facets of psychopathy directly and substantially, but captures boldness only indirectly and to a modest degree. Given its reliance on antisocially deviant indicators, the PCL-R is also ill-suited to investigation of non-criminal psychopathy in community settings. Thus, the primary aim of the present study was to evaluate the construct validity and neurobiological correlates of a newly-developed interview measure of the phenotypic boldness construct. Relationships between the Boldness Interview (BI) and multi-modal measures of psychopathy, externalizing psychopathology, and personality traits with theoretical or empirical links to the boldness construct were investigated in a sample of incarcerated adult males. The present study also investigated relationships between the BI measure and emotional modulation of the startle blink reflex – a well-validated physiological measure of fear reactivity that has previously been linked to the interpersonal-affective features of PCL-R psychopathy – in a picture-viewing paradigm. Results strongly supported the construct validity of the BI. Consistent with theory and prediction, BI total scores were: substantially and positively related to the PCL-R Interpersonal facet, the fearless

dominance factor of the self-report Psychopathic Personality Inventory (Lilienfeld & Andrews, 1996), and self-reported narcissism, thrill-seeking, and dominance; negatively related to self-report measures of harm avoidance, trait anxiety, fear, and internalizing symptoms; and largely unrelated to externalizing psychopathology. Total scores on the BI were also related to reduced startle amplitude during aversive pictures in the picture-viewing paradigm. These results are discussed in terms of their implications for the assessment and conceptualization of psychopathy (particularly non-criminal psychopathy) as well as the neurobiological underpinnings of the disorder.

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Chapter 1: Introduction

Overview

Psychopathy is a disorder characterized by features such as superficial charm, deceitfulness, manipulation of others, lack of empathy or remorse, impulsivity, irresponsibility, aggression, and a chronic pattern of antisocial behavior. In his highly influential work, *The Mask of Sanity*, Cleckley (1941) conceptualized psychopathy as a paradoxical combination of severe affective and behavioral deviance "masked" by a superficial appearance of adaptive psychological functioning. Cleckley also characterized psychopathy as a disorder that did not necessarily entail severe antisocial deviance, and he presented several case studies of "successful psychopaths": relatively high-functioning individuals who possessed key personality features of the disorder, but who refrained from engaging in serious antisocial behavior.

Recent work by Patrick and colleagues (Patrick, Fowles, & Krueger, in press) has suggested that psychopathy can be conceptualized in terms of three distinct phenotypes, labeled *disinhibition*, *meanness*, and *boldness*. The boldness facet of psychopathy, encompassing traits such as interpersonal dominance, immunity to life stress, thrill-seeking, and preference for novel or exciting situations over predictable routine, is conceptually similar to the "mask" discussed by Cleckley, and is proposed to arise from a relatively fearless temperament. However, the most widely-used measure for assessing psychopathy, the PCL-R (Hare, 1991, 2003), does not incorporate items that directly assess either fearlessness or the boldness component of psychopathy as described by Patrick et al. Consequently, the PCL-R places greater emphasis on the disinhibition and meanness facets of psychopathy, and minimizes the prominence of adaptive

psychological functioning in its conceptualization of psychopathy. The PCL-R is also not well-suited for assessing psychopathy in non-forensic settings, as it relies heavily on antisocially deviant behavioral indicators of psychopathy. This makes the PCL-R inappropriate for use in the study of successful psychopathy, and leads to a lack of definitional clarity regarding this phenotype.

In light of these issues, the aim of the present study was to evaluate the construct validity of an interview-based measure of the boldness construct. This interview measure was administered to a sample of adult male inmates who were also assessed using the PCL-R and other diagnostic and personality instruments relevant to the construct of psychopathy. In addition, a subset of the inmate sample took part in psychophysiological testing, which allowed the investigation of relationships between the boldness interview and a well-validated physiological index of fear reactivity, potentiation of the startle blink reflex.

Psychopathy, Fear, and Anxiety

Cleckley's seminal work forms the basis for modern conceptualizations of the psychopathy construct. His book, *The Mask of Sanity*, in which Cleckley recorded his observations and theories regarding psychopathic personality, was based on decades of experience at an inpatient psychiatric hospital. In *The Mask of Sanity*, Cleckley presented a series of highly detailed case studies from his own practice, in which he highlighted several features which distinguished psychopathy from other psychiatric disorders. In an effort to further clarify the scope and definition of psychopathy, Cleckley compiled a list of 16 key features of psychopathy. Among these features were indicators of behavioral deviance (e.g., irresponsibility, impulsive antisocial behavior, sexual promiscuity), and

affective deficits (e.g., lack of remorse or shame, shallow affect, poor attachment). Paradoxically, however, Cleckley's criteria for psychopathy also included several indicators of apparent psychological health, including relative immunity to life stress and a charming, capable social demeanor. Cleckley referred to these features as the "mask of sanity" – in other words, the severe underlying pathology of the psychopath is obscured by a superficial appearance of psychological well-being.

Whereas Cleckley hypothesized that the unique affective and interpersonal features of psychopathy are the result of a generalized affective deficit, subsequent etiological theories have suggested that psychopathy is distinguished from other more common antisocial phenotypes by a specific deficit in fear reactivity – defined here as a state of physiological arousal and behavioral avoidance in response to a specific environmental cue. Lykken's low fear hypothesis (1957, 1995) posited that criminal psychopathy is the result of a relatively fearless temperament paired with failed socialization. Citing evidence suggesting that conditioned fear is an integral component of the socialization process, Lykken argued that the individual low in trait fear would be naturally resistant to socialization efforts. In the absence of exceptional parenting, this would lead to the development of a weak conscience, emotional detachment from others, lack of empathy, and poorly constrained antisocial behavior – all of which are characteristic of criminal psychopathy. Lykken also speculated that relative fearlessness, in the presence of skilled parenting and a positive rearing environment, could result in an individual who exhibits the bold and daring behavior characteristic of criminal psychopaths, but who refrains from serious antisocial behavior – similar to the construct of successful psychopathy described by Cleckley.

From a neurobiological standpoint, a deficit in fear reactivity would likely involve components of the subcortical limbic system, most notably the amygdala, which is a centerpiece of the brain's defensive motivational system. Consistent with this notion, Fowles (1980) argued that the key factor underlying psychopathy is a relatively deficient behavioral inhibition system, a conceptual neurobehavioral system originally proposed by Gray (1987). The BIS is hypothesized to drive avoidance and withdrawal behavior when the individual is exposed to fear cues, and is associated with activity of the septo-hippocampal system and the amygdala. Fowles argued that a relatively weak BIS could potentially lead to the disinhibited reward seeking behavior characteristic of criminal psychopaths. Patrick and colleagues (Patrick, 2001, 2007; Patrick & Lang, 1999), as well as Fowles and Dindo (2006), have also proposed a dual-process model of psychopathy, which asserts that distinct etiological factors underlie the affective-interpersonal and antisocial deviance components of psychopathy. Specifically, the dual-process model posits that the interpersonal-affective features of the disorder (including grandiosity, glibness/charm, deceptiveness, conning/manipulation, lack of empathy/guilt, externalization of blame, and shallow affect) arise from a relatively fearless temperament underpinned by deficient amygdala reactivity to fear cues. On the other hand, the antisocial deviance features (including impulsivity, irresponsibility, lack of a life plan, parasitic lifestyle, boredom proneness, aggression, early conduct problems, juvenile delinquency, criminal versatility, and repeated failure of parole/probation) derive from deficits in key prefrontal and orbitofrontal cortex functions such as affect regulation, behavioral self-monitoring, and executive behavioral control.

Findings from laboratory research largely support the proposed link between psychopathy and fearlessness. In a classic study, Lykken (1957) reported that psychopathic individuals demonstrated poor conditioning of skin conductance responses (SCRs) to cues signaling punishment in a passive avoidance task. In subsequent research, Hare and colleagues (Hare, 1965a, 1965b; Hare, Frazelle, & Cox, 1978; for a review, see Hare, 1978) found that incarcerated psychopaths demonstrated reduced electrodermal activity when presented with cues signaling a variety of aversive stimuli. For example, Hare (1965a) examined electrodermal activity during a countdown to delivery of a painful electric shock in a sample of incarcerated men; in this study, psychopaths identified using a global rating of similarity to a Cleckley psychopathy prototyped exhibited reduced electrodermal activity that peaked later in the countdown series, relative to non-psychopaths. Hare (1965a) referred to this effect as a "steep temporal gradient of fear arousal" (p. 445) meaning that psychopaths appear to discount aversive events that are distant in time.

Electrodermal activity, however, is a physiological indicator of general autonomic arousal and not a specific marker of fear reactivity (Bradley, Codispoti, Cuthbert, & Lang, 2001; Greenwald, Cook, & Lang, 1989). One physiological measure that provides a more direct index of defensive activation is potentiation of the startle blink reflex. In humans, the startle blink reflex is measured via electromyographic (EMG) recording of the *orbicularis occuli* muscle, and is typically elicited using a loud and abrupt noise probe. Numerous studies have found that this reflex is reliably potentiated when the acoustic startle probe is delivered in the context of threatening or aversive cues, such as unpleasant pictures (Bernat, Patrick, Benning, & Tellegen, 2006; Vrana, Spence, & Lang,

1988) or conditioned stimuli signaling punishment (Grillon, Ameli, Woods, Merikangas, & Davis, 1991). These stimuli presumably activate the defensive motivational system, which in turn facilitates protective reflexes such as startle (Lang, Bradley, & Cuthbert, 1990). Extensive animal research has revealed that the primary mechanism behind this potentiation effect involves a neural projection from the central nucleus of the amygdala to the startle circuit in the brain stem (Davis, 1989; LeDoux, 1995).

Several studies have now found that psychopaths fail to show the typical pattern of startle blink potentiation while viewing aversive pictures (Levenston, Patrick, Bradley, & Lang, 2000; Patrick, Bradley, & Lang, 1993; Vanman, Mejia, Dawson, Schell, & Raine, 2003); rather, psychopaths either fail to exhibit startle potentiation or demonstrate an aberrant pattern of startle inhibition when exposed to aversive images. This deficit is consistently observed despite the fact that psychopaths, compared to controls, demonstrate no differences in autonomic reactivity (including heart rate, SCR), facial expressions (as measured via EMG recording of facial muscles associated with smiling and frowning), or subjective ratings of aversive pictures. Patrick (1994) reported a similar finding in the context of an aversive conditioning procedure, such that psychopaths, relative to non-psychopathic offenders, exhibited reduced startle amplitude during anticipation of an aversive noise stimulus. These results suggest that cues signaling danger or punishment, which normally prime the defensive motivational system and thereby augment protective reflexes such as the startle blink, have a significantly reduced impact on psychopaths. Interestingly, this deficit in startle potentiation has been specifically associated with the affective-interpersonal features of psychopathy, rather than the antisocial deviance facet (Patrick, 1994; Patrick et al., 1993; Vaidyanathan,

Bernat, Hall, & Patrick, 2009; Vanman et al., 2003). This dissociation suggests that the affective-interpersonal component of psychopathy is linked to a relatively fearless temperament, likely underpinned by reduced amygdala reactivity.

Recent laboratory research has employed neuroimaging methods to more directly examine the role of the amygdala in the link between psychopathy and deficits in fear reactivity. Results of these studies have largely supported the hypothesis that psychopathy is associated with reduced amygdala activity. Veit et al. (2002) found reduced amygdala activation during an aversive conditioning procedure among psychopaths, relative to healthy controls. In a subsequent study using a similar design, Birbaumer et al. (2005) found that psychopaths, relative to healthy controls, exhibited reduced left amygdala activation, as well as reduced SCR amplitude and lower subjective ratings of distress, during the acquisition phase of an aversive conditioning procedure. Kiehl and colleagues (Kiehl et al., 2001, 2003) have also reported a pattern of reduced amygdala activation, but increased frontal activation, among psychopaths during processing of both negative emotional words and pictures. Kiehl et al. have suggested that this pattern of increased frontal activation, in the context of reduced amygdala activity, reflects the engagement of cognitive processes to compensate for deficient limbic contribution to the processing of aversive stimuli. In a recent study, Marsh et al. (2008) found that these deficits in amygdala activation are also present in children and adolescents with conduct problems who also exhibit traits similar to the distinctive affective-interpersonal features of psychopathy. Specifically, children with “callous-unemotional” traits (reflecting features such as lack of remorse and manipulativeness), relative to children with attention-deficit/hyperactivity disorder and healthy controls,

demonstrated reduced amygdala activation and reduced functional connectivity between amygdala and ventromedial prefrontal cortex while processing fearful (but not angry or neutral) facial expressions.

Thus, as the foregoing review illustrates, substantial data from behavioral, electrodermal, startle, and neuroimaging measures support the theory that psychopathy is associated with a deficit in fear reactivity. Findings from startle and neuroimaging research also converge on the notion that this deficit is mediated by hypo-activation of the amygdala, a key component in the brain's defensive system. Furthermore, this deficit appears to be linked specifically to the affective-interpersonal features of psychopathy that distinguish the disorder from general antisocial deviance – in spite of the fact that none of the PCL-R items explicitly assess lack of fear or anxiety. However, despite strong conceptual and empirical support for the role of fearlessness in psychopathy, correlations between the PCL-R and personality or diagnostic measures of fear have been modest or inconsistent. Hicks and Patrick (2006) presented evidence that the weak relationships that have been reported between PCL-R psychopathy and psychometric indicators of fear arise due to the multi-faceted nature of the psychopathy construct. Specifically, they found that the affective-interpersonal facet of psychopathy exhibits consistently negative but modest correlations with multiple indicators of fear or anxiety, while the antisocial deviance component demonstrates an opposite pattern of correlations. However, when the two psychopathy components were entered into a regression model simultaneously as predictors of fear/anxiety, the predictive power of each increased substantially. This effect, known as cooperative suppression, strongly suggests that the measurement instrument in question (in this case, the PCL-R) taps multiple distinct

constructs (cf. Paulhus, Robins, Trzesniewski, & Tracy, 2004). What are the constructs measured by the PCL-R, and how did they come to be represented in an instrument designed to tap a putatively unidimensional construct? In order to address these questions, the following section will examine issues in the assessment of psychopathy as they relate to the constructs tapped by the PCL-R, as well as a promising self-report inventory of psychopathy, the Psychopathic Personality Inventory (PPI; Lilienfeld & Andrews, 1996).

Assessment and Conceptualization of Psychopathy

Hare's Psychopathy Checklist – Revised. Hare's (1991, 2003) PCL-R is by far the most widely-used and well-validated instrument for the assessment of psychopathy. The PCL-R, which is designed for use in correctional or forensic populations, utilizes a semi-structured interview, supplemented by review of institutional file information. It consists of 20 items, each of which is scored on a 3-point scale ranging from 0 (trait does not apply) to 2 (trait strongly applies) based on similarity to item descriptions found in the PCL-R manual. Total scores on the instrument are derived by summing items, and range from 0-40, with a recommended cutoff score of 30 or above for making a diagnosis of psychopathy.

The original version of the PCL was developed by Hare (1980) in an effort to operationalize the psychopathy criteria enumerated by Cleckley for use in research with forensic populations. Hare selected the final set of 22 items from a larger pool of candidate items on the basis of their ability to discriminate high and low scorers on a global rating of similarity to the Cleckley psychopathy construct. Interestingly, however, none of the positive adjustment features that Cleckley described were

ultimately included in this scale, or in the revised 20-item version of the instrument that followed. Thus, features reflecting the appearance of robust psychological health (i.e., the paradoxical "mask of sanity" that Cleckley emphasized), such as lack of anxiety or delusions, above-average intelligence, genuine charm, and resilience to suicide, were not incorporated in the PCL-R. Patrick and colleagues (Patrick, 2006; Patrick, Fowles, & Krueger, in press) have argued that, due to the predominance of deviant indicators among Cleckley's psychopathy criteria, and the fact that the original PCL was developed using an offender sample, indicators of positive adjustment were likely dropped from the final set of items due to lack of internal consistency. In other words, indicators of apparent psychological health were less likely to cohere with a set of items that largely reflected deviant affective and behavioral features. This presumably resulted in a measure that was more unidimensional than the multi-faceted, paradoxical construct described by Cleckley, and placed greater emphasis on emotional and behavioral deviance.

Although the PCL-R was developed with a putatively unitary construct in mind, item-level factor analyses of the instrument have nevertheless consistently revealed the presence of distinct factors within the PCL-R item set. Early factor analytic research on the PCL and PCL-R revealed a reliable two-factor structure (Harpur, Hakstian, & Hare, 1988; Hare, Harpur, Hakstian, Forth, Hart, & Newman, 1990). Factor 1 of the PCL-R is comprised of items reflecting the deviant affective and interpersonal features of psychopathy, including shallow affect, lack of empathy or remorse, externalization of blame, conning and deceitfulness, grandiosity, and glibness/superficial charm. Factor 2, on the other hand, consists of items reflecting chronic antisocial deviance and behavioral

disinhibition, including impulsivity, boredom proneness, irresponsibility, lack of long-term goals, parasitic lifestyle, aggression, childhood/adolescent delinquency, repeated revocation of parole/probation, and a versatile criminal career. More recent work has proposed alternative three-factor (Cooke & Michie, 2001) and four-factor (Hare, 2003; Hare & Neumann, 2006) structural models of the PCL-R, in which Factor 1 is parsed into distinct "interpersonal" (conning, deceptiveness, grandiosity, superficial charm) and "affective" (shallow affect, lack of empathy/remorse, blame externalization) facets. In the three-factor model, Factor 2 is reduced to a subset of items reflecting behavioral disinhibition and irresponsibility (impulsivity, boredom proneness, irresponsibility, parasitic lifestyle, lack of long-term goals); in the four-factor model, Factor 2 is comprised of this "lifestyle" facet as well as a separate facet reflecting chronic antisocial deviance ("antisocial" facet: aggression, childhood/adolescent delinquency, repeated revocation of parole/probation, criminal versatility).

The factors of the PCL-R are moderately correlated ($r \sim .50$), but nonetheless demonstrate divergent (and in some cases, opposing) relationships with a host of criterion-related variables across multiple domains, particularly when examining the unique variance in each factor via partial correlation or regression analyses. With regard to self-report personality traits, Factor 1 is related to several seemingly adaptive traits such as low self-reported fear, trait anxiety, and neuroticism (Hicks & Patrick, 2006; Patrick, 1994; Widiger & Lynam, 1998), as well as high social dominance/extraversion (Hare, 1991; Harpur, Hare, & Hakstian, 1989; Verona, Patrick, & Joiner, 2001; Widiger & Lynam, 1998) and positive affect (Patrick, 1994). However, Factor 1 also correlates positively with more exploitative and maladaptive traits such as narcissism,

machiavellianism, low empathy, and antagonism (Hare, 1991, 2003; Harpur et al., 1989; Verona et al., 2001; Widiger & Lynam, 1998). Factor 2, on the other hand, is correlated more consistently with maladaptive personality features, such as high trait anxiety (Hicks & Patrick, 2006; Verona et al., 2001), aggression, impulsivity and sensation-seeking (Harpur et al, 1989; Hare, 1991). In the domain of psychopathology, Factor 1 again demonstrates both adaptive and maladaptive correlates, as it is positively correlated with symptoms of antisocial personality disorder (APD; Hare, 2003), but also resilience to mood and anxiety disorders (Hicks & Patrick, 2006), as well as lower risk for suicide (Verona et al., 2001). Factor 2, however, is associated more uniformly with maladaptive psychological outcomes, including a substantially stronger association with APD (Hare, 2003; Verona et al., 2001), as well as positive correlations with symptoms of alcohol and substance abuse/dependence (Hare, 2003; Smith & Newman, 1990), depression (Hicks & Patrick, 2006), and suicide risk (Verona et al., 2001). In terms of behavioral correlates, Factor 1 has been associated with instrumental use of aggression and violent criminal offending, while Factor 2 is correlated with impulsive/reactive forms of aggression (Patrick & Zempolich, 1998; Porter & Woodworth, 2006) and an earlier onset and higher frequency of criminal offenses (Hare, 2003).

Research on the external correlates of the three- and four-factor models of psychopathy has also yielded interesting patterns of discriminant validity. Hall, Benning, and Patrick (2004) examined the criterion-related validity of the three-factor model of the PCL-R in a sample of adult male inmates. The interpersonal facet of Factor 1 (and in particular its unique variance when controlling for the other PCL-R factors) exhibited positive correlations with multiple markers of psychological adjustment, including

positive affect, social dominance, achievement, verbal intelligence, socioeconomic status, and low stress reactivity. The affective facet, on the other hand, was associated with a higher number of violent criminal offenses and low sociability, while the disinhibition facet was correlated with impulsivity, aggression, anger, low positive affect, anxiety, sensation seeking, symptoms of APD and alcohol/substance abuse, and a variety of criminal offenses.

Self-Report Psychopathy Assessment. Although the PCL-R has demonstrated impressive construct validity in correctional and forensic populations, it is not well-suited to measurement of psychopathy in community samples due to its reliance on a lengthy (60-90 minute) interview and the availability of collateral file information. As noted above, the items of the PCL-R also rely heavily on socially deviant behaviors and attitudes as indicators of psychopathic traits, making it less than ideal for the assessment of psychopathy in a non-forensic population. As an alternative, researchers have increasingly made use of self-report measures of psychopathy in community samples. One promising self-report psychopathy measure is the Psychopathic Personality Inventory (PPI; Lilienfeld & Andrews, 1996), which was designed using a personality-based approach and intended to tap a wide array of traits described by Cleckley and other psychopathy theorists. Prior to the development of the PPI, the most widely-used self-report measures for assessing psychopathy were the MMPI Pd scale (McKinley & Hathaway, 1944) and the Socialization (So) scale of the California Psychological Inventory (CPI; Gough, 1987). However, neither measure is particularly well-suited for this purpose, as they both primarily index the antisocial behaviors associated with

psychopathy, and are only negligibly correlated with the core personality features of psychopathy (Hare, 2003; Harpur et al., 1989) described by Cleckley and others.

The items and scales of the PPI were rationally derived on the basis of an exhaustive survey of the theoretical literature on psychopathy, and then refined via an iterative process of item-level factor analysis across three samples (total N = 1104; Lilienfeld & Andrews, 1996). Since the PPI was primarily intended for use in noncriminal populations, an effort was also made to develop test items that measured psychopathic personality attributes without explicit reference to antisocial behaviors. The resulting measure consisted of 187 items grouped into eight subscales: Machiavellian Egocentricity, Social Potency, Fearlessness, Coldheartedness, Impulsive Nonconformity, Blame Externalization, Carefree Nonplanfulness, and Stress Immunity. The PPI has demonstrated adequate convergent and discriminant validity, as total scores correlate substantially with both factors of the PCL-R, global ratings of Cleckley psychopathy, narcissism, and antisocial personality disorder features. Consistent with theory, PPI total scores also correlate negatively with measures of fear and anxiety (Lilienfeld & Andrews, 1996; Poythress, Edens, & Lilienfeld, 1998).

Factor analysis of the PPI subscales has revealed a two-factor structure that closely parallels the structure of the PCL-R (Benning, Patrick, Hicks, Blonigen, & Krueger, 2003). The first factor (PPI-1), which has been labeled *fearless dominance* (Benning, Patrick, Blonigen, Hicks, & Iacono, 2005a) consists of the Social Potency, Stress Immunity, and Fearlessness subscales, and reflects a personality style marked by interpersonal dominance, lack of fear or anxiety, and sensation-seeking. The second factor (PPI-2), dubbed *impulsive antisociality*, is comprised of the scales Impulsive

Nonconformity, Blame Externalization, Machiavellian Egocentricity, and Carefree Nonplanfulness, and taps a rebellious, impulsive, aggressive, and blame externalizing personality dimension. The Coldheartedness scale, which taps a lack of empathy or sentimentality, does not load substantially on either factor. The two-factor structure of the PPI has been replicated among undergraduate (Benning, Patrick, Salekin, & Leistico, 2005b), community (Benning et al., 2003), and correctional (Patrick, Edens, Poythress, Lilienfeld, & Benning, 2006) samples. Of note, unlike the PCL-R, the two factors of the PPI are essentially orthogonal to each other (Benning et al., 2003; Patrick et al., 2006; however, see Benning et al., 2005b, for an exception), suggesting that they tap completely independent dimensions of personality.

Research in forensic samples has indicated that PPI-1 relates selectively (but to a modest degree; r ~ .30) to the unique variance in PCL-R Factor 1 – and the interpersonal facet in particular (Benning et al., 2005a) – whereas PPI-2 correlates selectively (and more strongly; r ~ .40) with Factor 2 of the PCL-R. The external correlates of the two PPI factors also parallel the correlates of PCL-R Factors 1 and 2 (Benning et al., 2005a; Benning et al., 2003; Benning et al., 2005b; Patrick et al., 2006; Ross, Benning, Patrick, Thompson, & Thurston, 2009). Like PCL-R Factor 1, PPI-1 consistently exhibits negative correlations with multiple measures of trait anxiety, neuroticism, and symptoms of mood and anxiety disorders; and positive correlations with interpersonal dominance, extraversion, thrill-seeking, and narcissism. Unlike its PCL-R counterpart, however, PPI-1 exhibits rather modest or null relationships with antisocial behavior and symptoms of APD. Also, like the unique variance in the PCL-R interpersonal facet, PPI-1 is positively correlated with socioeconomic status and educational achievement (Benning et al., 2003),

and is also positively correlated with neuropsychological measures of executive function (Sellbom & Verona, 2006). In contrast, PPI-2 is correlated exclusively with maladaptive traits and behaviors, including impulsivity, anger/aggression, boredom proneness, trait anxiety/neuroticism, low socialization, low empathy, and symptoms of APD, borderline personality disorder, depression, and alcohol and substance abuse/dependence. PPI-2 is also negatively correlated with IQ, educational achievement, and socioeconomic status (Benning et al., 2003), as well as impaired executive function and response inhibition (Sellbom & Verona, 2006). At the genotypic level, twin research has indicated that PPI-1 is associated with diminished genetic risk for internalizing psychopathology, whereas PPI-2 demonstrates genetic overlap with risk for externalizing psychopathology (Blonigen, Hicks, Krueger, Patrick, & Iacono, 2005).

The two factors of the PPI also demonstrate divergent psychophysiological correlates. Benning, Patrick, and Iacono (2005c) examined the PPI factors in relation to startle modulation and skin conductance responses during a picture-viewing paradigm in a sample of community males (N = 355). In extreme group analyses, low PPI-1 participants demonstrated a normal pattern of startle potentiation during aversive image viewing, whereas the high PPI-1 group exhibited an abnormal pattern of startle inhibition for aversive pictures (relative to neutral), similar to criminal psychopaths. High PPI-1 participants also exhibited reduced amplitude of skin conductance responses to aversive pictures. PPI-2, on the other hand, was unrelated to startle, but was associated with an overall reduction in the amplitude of skin conductance responses to pictures, regardless of emotional valence. Gordon, Baird, and End (2004) used fMRI to explore relationships between the PPI factors and patterns of brain activation during a facial emotion

recognition task. Whereas the low PPI-1 group in this study evidenced a pattern of brain response characterized by both prefrontal cortex and amygdala activation, individuals in the high PPI-1 group primarily demonstrated activation in right dorsolateral prefrontal cortex, with no significant activation of the amygdala. This pattern suggests a reliance on cognitive, rather than affective, processing of emotional stimuli, and is consistent with prior research demonstrating increased prefrontal cortex activation during emotional tasks among criminal psychopaths, presumably to compensate for deficient subcortical limbic activation (Kiehl et al., 2001). In contrast, the high PPI-2 group in the Gordon et al. (2004) study exhibited a pattern of increased amygdala activation, suggesting an exaggerated emotional response, and perhaps deficient affect regulation. Subsequent research has also found reduced amygdala activation among individuals high in PPI-1 in response to betrayal or "defection" by a partner in a prisoner's dilemma game (Rilling et al., 2007). Although unrelated to amygdala activity in this study, PPI-2 was associated with reduced anterior cingulate activity during response selection periods that preceded a decision to defect against a partner, suggesting reduced neural processing of response conflict.

Summary. Evidence from multiple lines of research converges on the notion that the two factors of the PCL-R tap distinct constructs with separate etiologies, despite their correlated nature. Specifically, the two PCL-R factors demonstrate divergent correlates across domains of personality, psychopathology, behavior, and neurobiology. To return to a question posed in the previous section, what are the constructs tapped by the PCL-R? Factor 1, which is associated with a mixture of maladaptive (narcissism, low empathy, machiavellianism, APD symptoms, instrumental aggression) and adaptive (sociability,

relatively low fear/anxiety, resilience to suicide and internalizing psychopathology) traits, and associated with neurobiological markers of deficient fear reactivity (reduced startle potentiation and amygdala responses to fear cues), appears to index a relatively fearless, interpersonally dominant, cruel, exploitative, and emotionally detached phenotype. Factor 2, on the other hand, is associated more exclusively with a number of maladaptive traits and behaviors (impulsivity, angry/reactive aggression, high negative affect/anxiety, sensation seeking, criminal offending, suicide risk, and symptoms of APD, substance abuse/dependence, and internalizing disorders), and appears to measure an impulsive, irresponsible, aggressive, and irritable phenotype. Notably absent from the PCL-R conceptualization of psychopathy, however, are features reflecting the appearance of psychological health or the "mask of sanity" that Cleckley emphasized as the key component that distinguishes psychopathy from other antisocial phenotypes. This likely resulted from the initial strategy used to develop the PCL-R item set, which emphasized emotional and behavioral deviance as markers of a putatively unidimensional construct. Nevertheless, the unique variance in Factor 1 of the PCL-R (and the interpersonal facet in particular) – controlling for its substantial overlap with Factor 2 – does relate to external variables in a manner suggesting that this component of the PCL-R taps the adaptive features of psychopathy described by Cleckley, at least indirectly.

The PPI, on the other hand, was developed using a personality-based approach in which psychopathy is conceptualized as a multi-dimensional configuration of traits, and appears to tap the adjustment features of psychopathy more directly. Like the PCL-R, the PPI exhibits a reliable two-factor structure; the two factors of the PPI bear close resemblance to the factors of the PCL-R in terms of content and external correlates, but

with some notable differences. First, the two factors of the PPI are essentially orthogonal to each other, whereas the PCL-R factors are moderately correlated. The uncorrelated nature of the PPI factors is most likely a consequence of the "bottom-up" approach used to select items for the PPI, which emphasized the multi-dimensional nature of the psychopathy construct as described by Cleckley and other theorists. Furthermore, the items constituting both PCL-R factors are heavily saturated with antisocial deviance (Patrick, Hicks, Nichol, & Krueger, 2007), which is likely to inflate correlations between the factors due to common reliance on deviant behavioral indicators for item scoring. In contrast, the items of the PPI (particularly those that load on scales comprising PPI-1) were intended to measure psychopathic traits without explicit reference to antisocial behaviors. Consequently, PPI-1 appears to be unrelated to tendencies toward externalizing psychopathology, including antisocial behavior and substance abuse. Also, while PCL-R Factor 1 is associated with a mixture of maladaptive and adaptive traits, PPI-1 appears to relate more directly to indicators of psychological adjustment and resilience to internalizing psychopathology, at both phenotypic and genotypic levels of analysis. Nevertheless, PCL-R Factor 1 and PPI-1 share strikingly similar neurobiological correlates, suggesting an overlapping etiologic process rooted in diminished physiological reactivity to fear cues.

How can these differing conceptualizations of the psychopathy construct be reconciled? Although the PCL-R and PPI both appear to capture the behavioral deviance component described by Cleckley (e.g., impulsivity, irresponsibility, rebelliousness), these two conceptualizations of psychopathy place differing emphasis on features reflecting psychological adjustment versus affective deficits. Whereas the PPI clearly

emphasizes a fearless, resilient, and socially dominant psychopathy phenotype, the PCL-R embodies a much more deviant expression of the disorder, characterized by emotional detachment, deliberate cruelty, and exploitation of others. Recent work by Patrick, Fowles, and Krueger (in press) has proposed that psychopathy can be conceptualized in terms of three distinct phenotypic constructs that may shed light on these and other historical discrepancies in the conceptualization of psychopathy, as described in the following section.

The Triarchic Model of Psychopathy

Based on an extensive review of the theoretical and empirical literature on psychopathy, Patrick et al. (in press) proposed that psychopathy can be decomposed into three distinct, elemental phenotypic constructs. In this conceptual framework, psychopathy represents the nexus of *disinhibition*, reflecting tendencies toward impulsivity, deficient behavioral constraint, and poor affect regulation; *meanness*, which encompasses traits such as lack of empathy, cruelty, and exploitativeness; and *boldness*, reflecting relative fearlessness, social dominance, and resilience to stress. These authors noted that the various theories of psychopathy that have been advanced in the seven decades since Cleckley's original publication of the *Mask of Sanity* have emphasized these constructs in varying degrees, which has led to discrepancies in how psychopathy is conceptualized, operationalized, and studied. Below, these three constructs will be explored in terms of their referents in the PCL-R and PPI, links to other constructs from the domains of personality and psychopathology, neurobiological correlates, and hypothesized etiologic substrates.

Disinhibition. The disinhibition component of psychopathy, as described by Patrick and colleagues (in press), encompasses a broad range of deviant behavioral and personality features, including impulsivity, inadequate behavioral monitoring and constraint, a short time horizon, failure to plan for the future, impatience, low frustration tolerance, angry/reactive aggression, and poor regulation of affect. Historically, disinhibition has been well-represented in most theoretical accounts of psychopathy, as these features tend to be the most salient behavioral markers of the disorder and are also most likely to result in legal or social problems. Cleckley's criteria included several markers of disinhibition, including "inadequately motivated" antisocial behavior, failure to learn from experience, unreliability, "fantastic and uninviting" behavior while intoxicated, promiscuity, and lack of a life plan. In terms of the PCL-R, the disinhibition construct is best represented by Factor 2, and by the lifestyle facet (comprised of impulsivity, irresponsibility, boredom proneness, failure to plan, and parasitic lifestyle) in particular; in the PPI, disinhibition is best captured by PPI-2, particularly the Impulsive Nonconformity and Carefree Nonplanfulness scales.

Disinhibition, as defined by Patrick et al. (in press) overlaps substantially with externalizing, a latent factor that accounts for the comorbidity among DSM-IV (American Psychiatric Association, 2000) disorders such as APD, conduct disorder (CD) and alcohol/substance dependence (Krueger, Hicks, Patrick, Carlson, Iacono, & McGue, 2002; Young, Stallings, Corley, Krauter, & Hewitt, 2000), and reflects general tendencies toward disinhibited behavior. Indeed, structural modeling has revealed that the unique variance in Factor 2 is essentially identical to the externalizing factor (Patrick, Hicks, Krueger, & Lang, 2005), and PPI-2 evidences substantial genetic overlap with

externalizing (Blonigen et al., 2005). Much like externalizing, disinhibition can be defined in personality terms of low behavioral constraint and high negative emotionality (Krueger, Caspi, Moffitt, Silva, & McGee, 1996) – including both the distress/anxiety and anger/aggression facets of negative emotionality (cf. Hicks & Patrick, 2006). The disinhibition component of psychopathy, as well as the broader construct of externalizing with which it overlaps, is hypothesized to involve neurobiologically based deficits in self-monitoring (Hall, Bernat, & Patrick, 2007), affect regulation (cf. Davidson, Putnam, & Larson, 2000), and executive control of behavior (cf. Raine, 2002), presumably rooted in prefrontal and anterior cingulate cortex.

Meanness. Meanness is conceptualized by Patrick et al. (in press) as a phenotype marked by a callous lack of empathy or concern for others, lack of emotional attachment, exploitativeness, instrumental aggression, and deliberate cruelty. The construct is also described by Patrick et al. as "agentic disaffiliation – a motivational style in which pleasure and satisfaction are actively sought without regard for and at the expense of others." This trait dimension is strongly emphasized in McCord and McCord's (1964) conceptualization of psychopathy, which posits that the central deficits in psychopathy are guiltlessness and lovelessness, and that the psychopath's "emotional relationships, when they exist, are meager, fleeting, and designed to satisfy his own desires" (p. 17). Cleckley's criteria included several features consistent with meanness, including lack of remorse/shame, "poverty" of emotional reactions, "incapacity for love," and "unresponsiveness" in relationships; however, Cleckley framed these characteristics as primarily reflecting deficient affective responses, rather than active or agentic exploitation of others. In the PCL-R, meanness is captured predominantly by the

affective facet of Factor 1 (comprised of lack of empathy/remorse, blame externalization, and shallow affect), although the scoring criteria for items constituting the interpersonal factor also make reference to feelings of superiority, a “survival of the fittest” mentality, and taking pleasure in the deception and exploitation of others. Although meanness is not well represented in either factor of the PPI, the Coldheartedness scale (which reflects low affiliation and lack of sentimentality, and does not load appreciably on either factor) appears to capture at least some aspects of phenotypic meanness. Aspects of PPI-2, notably the Machiavellian Egocentricity scale (which taps willingness to harm or take advantage of others in order to achieve goals) also bear conceptual resemblance to meanness.

In personality terms, Patrick et al. (in press) described meanness as a combination of low affiliation and high dominance from the interpersonal circumplex model, and low Agreeableness, Neuroticism, and Extraversion from the Five-Factor Model. With regard to psychopathology, meanness is likely to be associated with symptoms of APD and CD, particularly those features reflecting lack of remorse and aggression in the APD criteria, and weapon use and intentional cruelty to people/animals in the CD criteria. Furthermore, research on the construct of callousness in adolescents, which bears strong conceptual similarity to phenotypic meanness in adults, has consistently revealed associations with low trait anxiety/neuroticism, fearlessness, thrill-seeking, and diminished reactivity to negative emotional cues (cf. Frick & White, 2008). These data point to deficient fear reactivity as an etiologic contributor to meanness. Specifically, a relatively fearless temperament is hypothesized to hinder the processes of socialization

and conscience development via a reduction in aversive arousal states associated with rule-breaking or the distress of others (Blair, 1999; Kochanska, 1993; Newman, 1987).

Boldness. The construct of boldness, as conceptualized in the triarchic model of psychopathy, is a phenotype encompassing traits such as social dominance and efficacy, self-confidence, immunity to life stress, thrill-seeking, tolerance of novelty and uncertainty, and the ability to remain calm in the face of threat. Historically, the boldness construct has been emphasized most prominently in Cleckley's conceptualization of psychopathy, in which he described a number of case examples who were socially poised, persuasive, charming, and emotionally stable (i.e., lacking anxiety). In the PCL-R, boldness is best represented by the unique variance in Factor 1 (controlling for the substantial overlap with Factor 2), and the interpersonal facet in particular. However, PCL-R Factor 1 appears to measure boldness only indirectly, and taps a much more virulent, deviant expression of boldness than that described by Cleckley, which may explain the relatively modest zero-order correlations between Factor 1 and indicators of psychological adjustment or low anxiety. In contrast, PPI-1 appears to measure phenotypic boldness directly, as indicated by more robust correlations with low trait anxiety, thrill seeking, and social dominance, as well as other indicators of psychological adjustment.

From a personality perspective, the core of boldness is low trait anxiety/neuroticism, high social dominance, and novelty-seeking. Phenotypic boldness is hypothesized to be associated with resilience to internalizing psychopathology, including depression, anxiety disorders, and suicidality. As noted previously, PPI-1 demonstrates negative phenotypic correlations with both self-report and diagnostic measures of

internalizing disorder symptoms, and demonstrates a negative genetic correlation with internalizing psychopathology (Blonigen et al., 2005). However, PPI-1 is essentially unrelated to indicators of externalizing psychopathology. Like phenotypic meanness, boldness is thought to be underpinned by deficient fear reactivity, and this hypothesis is strongly supported by research (reviewed above) linking PPI-1 to reduced startle potentiation and amygdala activation during aversive or threatening cues. However, whereas meanness is thought to arise from the potentially disruptive impact of fearlessness on socialization processes, Patrick et al. (in press) suggest that boldness be construed as "a purer, more benign expression of underlying temperamental fearlessness" – in other words, the phenotypic expression of a fearless genotype, in the absence of failed socialization. A logical extension of this argument is that it is inconsistent with theory for an individual to be high in both boldness and meanness – thus, individual psychopaths may be characterized predominantly by traits suggesting boldness or meanness, but not both. Indeed, research on subtypes of psychopathy has found evidence of two distinct groups within the incarcerated psychopathic population – a socially dominant, low-anxious group, and an aggressive, disinhibited, high-negative emotionality group (Hicks, Markon, Patrick, Krueger, & Newman, 2004; Skeem, Johansson, Andershed, & Eno Louden, 2007).

"Successful" or Non-criminal Psychopathy and Phenotypic Boldness. As noted above, the boldness construct is considered to be essentially orthogonal to tendencies toward disinhibition/externalizing. This suggests that boldness may be of particular relevance to the conceptualization and assessment of successful, or non-criminal psychopathy, defined as the presence of affective-interpersonal features of psychopathy

in the absence of serious antisocial deviance (Hall & Benning, 2006). Research on non-criminal manifestations of psychopathy could potentially yield valuable insights regarding etiologic factors that shape the expression of genotypic fearlessness away from phenotypic meanness and toward more benign manifestations of a fearless temperament, i.e. boldness. However, despite a recent surge of interest in this topic, non-criminal psychopathy remains an under-studied construct, largely due to difficulties related to the conceptualization and assessment of this phenotype.

Although the PCL-R remains the most well-validated instrument for assessing psychopathy in criminal populations, its use in non-forensic settings is problematic for several reasons. Methodologically, the PCL-R requires a lengthy (60-90 minute) semi-structured interview, as well as the availability of collateral file information, which makes the PCL-R impractical for use in community settings. Furthermore, the PCL-R was specifically designed for and validated among a prisoner population, rendering its generalizability to non-forensic settings problematic. Also, as noted previously, the items of the PCL-R (both Factors 1 and 2) rely heavily on socially deviant indicators, making the PCL-R inappropriate for measuring non-criminal manifestations of psychopathic traits. Furthermore, the previous section has highlighted how the PCL-R measures boldness only indirectly, and to a modest degree. Although a screening version of the PCL-R (PCL:SV; Hart, Cox, & Hare, 1995) has been developed for use in non-forensic settings, the PCL:SV is similar to the PCL-R in that its items are heavily saturated with markers of antisocial deviance.

As an alternative to PCL-R assessment of psychopathy in non-criminal populations, researchers have increasingly made use of self-report psychopathy measures,

including the PPI. The PPI is particularly promising in this regard, as it appears to directly tap the boldness dimension of psychopathy and is related to a variety of indictors of psychological adjustment. As noted previously, the items of the PPI do not rely on antisocially deviant indicators as behavioral referents for traits, and PPI-1 is uncorrelated with markers of disinhibition and criminal behavior. Furthermore, unlike the PCL-R and its variants, the PPI is easily administered to large samples, making it a practical instrument for purposes of large-scale screening.

Summary and Integration. Historical accounts of psychopathy, most notably Cleckley's highly influential work, have depicted the disorder as a paradoxical combination of deviant behavioral disinhibition and affective deficits, masked by the superficial appearance of psychological adjustment. Although the PCL-R was intended to capture Cleckley's conceptualization of the psychopathy construct, this instrument appears to tap a much more aggressive and deliberately cruel phenotype than Cleckley's portrayal of the psychopath as a charming, carefree rogue who hurts others coincidentally via unrestrained reward-seeking, not out of cruelty or spite. This is likely a consequence of the strategy used to develop items for the PCL-R, which favored deviant affective and behavioral traits as indicators of a putatively unidimensional construct, rather than the multi-dimensional psychopathy construct depicted in Cleckley's work. Nevertheless, there is substantial evidence suggesting that the PCL-R taps distinct phenotypic constructs related to dispositional fearlessness (i.e., Factor 1) on the one hand and disinhibited externalizing psychopathology (i.e., Factor 2) on the other.

In terms of the triarchic model of psychopathy advanced in recent work by Patrick and colleagues, Cleckley's psychopathy construct emphasizes phenotypic disinhibition

and *boldness*, while the PCL-R conceptualization of psychopathy places greater emphasis on disinhibition and *meanness*. Boldness and meanness are conceptualized as alternate phenotypic expressions of a relatively fearless disposition, with meanness representing a fearless temperament that has resulted in failed socialization processes. Although elements of the PCL-R (particularly the unique variance in the interpersonal facet of Factor 1), demonstrate modest overlap with the boldness construct, this relationship is indirect and not particularly distinct, as these same elements of the PCL-R also evidence substantial relationships with aggressive externalizing tendencies (which is theoretically unrelated to boldness). In contrast, PPI-1 of Lilienfeld's self-report Psychopathic Personality Inventory appears to measure the boldness phenotype much more distinctly (as indicated by its orthogonal relationship with PPI-2 and other indicators of externalizing tendencies) and directly (as evidenced by substantial correlations with low trait anxiety/neuroticism, social dominance, and relative fearlessness). PPI-1 also demonstrates consistent relationships with diminished physiological responses to aversive or threatening cues, suggesting an etiologic substrate involving deficient amygdala reactivity. The boldness construct, as well as its operationalization in PPI-1, may be of particular relevance to the assessment and conceptualization of successful, or non-criminal psychopathy, an understudied phenomenon that could potentially shed light on etiologic factors that may shape the phenotypic expression of fearlessness in adaptive (i.e., boldness) rather than maladaptive/destructive (i.e. meanness) directions.

Present Study

In light of the issues summarized above, the aim of the present study was to validate a newly-developed interview-based measure of the boldness construct. This

effort was primarily intended to address the aforementioned under-representation of the boldness construct in the PCL-R conceptualization of psychopathy. Furthermore, development of a boldness interview would help to address the current lack of well-validated interview measures that are appropriate for assessing psychopathy in non-forensic populations, without reliance on socially deviant indicators of the disorder. Toward this end, development of the boldness interview proceeded in three stages (described in greater detail in the Method section, below). The first stage focused on the development of a coherent set of items tapping the boldness construct in the self-report measurement domain. In the second stage, this item set, which drew on content from existing self-report measures of boldness and related constructs (including PPI-1, thrill/adventure-seeking, low harm avoidance), was refined and validated across several waves of data collection with large undergraduate samples. In the third stage, the content of the final 153-item self-report boldness measure was then adapted to semi-structured interview format.

Following established guidelines for construct validation, (Campbell & Fiske, 1959; Cronbach & Meehl, 1955), the convergent and discriminant validity of the Boldness Interview was then evaluated in relation to relevant personality and diagnostic variables from self-report and interview measurement domains in a sample of adult male inmates. These variables included PCL-R psychopathy, DSM-IV symptoms of externalizing disorders, and self-reported psychopathy, externalizing tendencies, normal-range personality traits, narcissism, harm avoidance, sensation-seeking, and internalizing disorder symptoms. Data from institutional file information regarding criminal offending history were also available. Furthermore, in order to test the hypothesis that phenotypic

boldness reflects tendencies toward dispositional fearlessness, the present study also investigated the relationship between the Boldness Interview and physiological reactivity to aversive emotional cues. Specifically, a subset of participants completed an emotional picture-viewing paradigm in which eyeblink responses to acoustic startle probes were measured while participants viewed photographic images varying in affective content and valence.

Based on prior research, it was predicted that the Boldness Interview would demonstrate convergent validity with PCL-R Factor 1 (particularly the Interpersonal facet) in the interview domain, and with PPI-1, self-report boldness, and indicators of social dominance, narcissism, and thrill/adventure-seeking in the self-report domain. It was also predicted that the Boldness Interview would exhibit negative correlations in relation to trait anxiety, harm avoidance, fears, and internalizing symptoms in the self-report domain, and in relation to startle potentiation during aversive picture viewing in the physiological domain. Finally, it was predicted that the Boldness Interview would demonstrate discriminant validity in relation to PCL-R Factor 2 and DSM-IV externalizing disorder symptoms (including APD, and alcohol/substance/nicotine dependence) in the interview domain, as well as PPI-2 and externalizing psychopathology in the self-report domain. Scores on the Boldness Interview were also predicted to be unrelated to criminal offense history data.

Chapter 2: Method

Participants

Participants were 189 adult male inmates at a medium-security state correctional facility near Minneapolis, Minnesota. Volunteers were recruited from sign-up forms made available following informational presentations about the research project delivered in residential units at the correctional facility. Screening criteria for participation in the study included the following: age between 18 and 45 years; absence of any major neurological conditions or visual/auditory impairments that would impact ability to participate in the psychophysiological assessment; and ability to converse fluently in English. Inmates with release dates within one month of recruitment were also not eligible to participate. The mean age of participants in the sample was 32.6 years (SD = 7.6, range = 20 – 45). The racial and ethnic composition of the sample was 52.4% White Non-Hispanic (n = 99), 20.1% African-American (n = 38), 9.5% Hispanic (n = 18), 4.2% Asian-American (n = 8), and 13.8% other or mixed ethnicity (n = 26). From this overall sample, a subset of 167 participants took part in psychophysiological testing; of this group, 6 participants were excluded due to recording equipment malfunction or procedural irregularities, and 15 were omitted from analyses due to excessive physiological artifact or zero-amplitude responses (see Data Reduction, below), resulting in a final sample of 146 participants for the psychophysiological portion of the study. Self-report and diagnostic data were also available for a varying number of participants for each study measure.

Participants were reimbursed $10 for each of the three study sessions (described below) that they completed. Informed consent was obtained prior to the beginning of the

first session, and reviewed at the beginning of the two subsequent sessions. This research protocol was reviewed and approved by institutional review boards at both the University of Minnesota and the Minnesota Department of Corrections.

Interview and File Measures

Boldness Interview. The Boldness Interview (BI) is a semi-structured interview measure (see Appendix A) intended to capture the phenotypic boldness construct as described in Patrick et al.'s (in press) triarchic model of psychopathy. Thus, the BI was designed to assess traits such as social poise and dominance, relative immunity to life stress, lack of fear in the context of threat or pressure, and tolerance for novel or dangerous situations. As described above, development of the BI proceeded in three stages: item pool generation, iterative validation and refinement of the item set, and adaptation to interview form. The process used to develop the item set is described in greater detail elsewhere (Patrick, Vaidyanathan, Bayevsky, & Benning, 2009). Briefly, items were written by project staff who were familiar with the target construct and relevant literature. Multiple sources were consulted, including existing scales that tap constructs either theoretically or empirically related to boldness (e.g., dominance, narcissism, sensation-seeking, existing psychopathy measures), as well as omnibus measures of normal-range personality. In the second stage, the psychometric properties of proposed test items were examined by administering the items to a sample of male and female undergraduates. Items were retained if they demonstrated primary loadings on target construct scales (with no substantial secondary loadings) and demonstrated stronger correlations with PPI-1 than with measures of externalizing. Using IRT analysis, the scales were further refined by retaining only those items that demonstrated

good discrimination or difficulty parameters or contributed substantial information at the extremes of trait dimensions. This iterative process was carried out through several rounds of item generation and subsequent waves of data collection and scale refinement; the ultimate sample size of the self-report validation effort was N = 1,937 male and female undergraduates. In the third and final stage of development, the content of the remaining self-report boldness items was adapted to semi-structured interview format, and a manual detailing scoring procedures (see Appendix B) for each item was produced.

The resulting BI measure was comprised of ten scales: Courage, Social Assurance, Self-Confidence, Glibness, Dominance, Persuasiveness, Intrepidness, Resiliency, Optimism, and Tolerance for Uncertainty (see Table 1). Each scale consists of 2-5 items, rated by the interviewer on a Likert-type scale ranging from 1 (does not apply) to 5 (strongly applies). Ratings are made on the basis of similarity to high and low item score descriptions found in the scoring manual. Ratings for each item are then averaged within scale, and summed across scales to generate a total score (see Appendix C).

Psychopathy Checklist—Revised. The PCL-R (Hare, 1991, 2003) is designed to measure psychopathic personality traits and behaviors in criminal populations and consists of a semi-structured interview, supplemented by a review of institutional file data as a collateral source of information. The PCL-R consists of 20 items rated by the interviewer on a scale of 0 (not descriptive) to 2 (highly descriptive). Item scores are summed to yield a total score, which is intended to reflect degree of overall resemblance to a psychopathy prototype. The PCL-R also yields two factor scores: Factor 1 consists of items that measure interpersonal-affective features, and consists of separate Affective

Table 1. Boldness Interview scale information and content.

Boldness Interview Scale	**Number of Items**	**Description**
Courage	5	Remains calm when faced with threat or pressure; recovers quickly from fearful situations
Social Assurance	5	At-ease in social interactions, poised, comfortable drawing attention to self
Self-Confidence	3	High self-esteem, confident in abilities, not discouraged by challenges
Glibness	4	Talkative, skilled in conversation, interpersonally engaging, witty
Dominance	4	Asserts will over others, aspires to and spontaneously assumes leadership roles
Persuasiveness	4	Able to influence others through argument and use of more indirect tactics
Intrepidness	2	Actively seeks dangerous activities for enjoyment, pursues physiological arousal of danger
Resilience	4	Deals effectively with life stress, overcomes major challenges, rebounds quickly from stress
Optimism	3	Feels lucky, looks forward to the future, not preoccupied with potential misfortune
Tolerance for Uncertainty	3	Prefers novelty and excitement over comfort of predictability and routine

(shallow affect, lack of empathy or remorse) and Interpersonal (superficial charm, grandiosity, conning and deceitfulness) facets; Factor 2 consists of items measuring chronic antisocial deviance, and is comprised of Lifestyle (impulsivity, irresponsibility, failure to plan, parasitic lifestyle) and Antisocial (aggression, childhood behavior problems, juvenile and adult criminal record, failure on parole/probation) facets.

DSM-IV Externalizing Disorders. Interview assessments of DSM-IV symptoms for the following disorders were collected: antisocial personality disorder, conduct disorder, alcohol dependence, substance dependence, and nicotine use disorder. These diagnoses were chosen because of their empirical or theoretical links to the externalizing factor of psychopathology (cf. Krueger, 1999; Krueger et al., 2002). Symptoms were assessed using a modified version of the Structured Clinical Interview for DSM-IV (SCID; First, Spitzer, Gibbon, & Williams, 1997; First, Spitzer, Gibbon, Williams, & Benjamin, 1997). Scores on the first principal component accounting for the statistical overlap among symptoms of these disorders were computed using multiple regression and used to represent the externalizing psychopathology factor in correlational analyses.

Criminal History. Two measures of criminal behavior, violent and non-violent offenses, were coded from institutional file data available for each participant. Violent crimes were coded as the number of formal criminal convictions (including the inmate's current or "governing" offense) pertaining to crimes of homicide, assault, robbery, domestic violence, weapon offenses, kidnapping, and terroristic threats, that appeared in a participant's correctional file. Non-violent offenses were coded as the number of formal criminal convictions for crimes ranging from property offenses (e.g., theft,

burglary, shoplifting) to drug-related charges (e.g., possession, sales/distribution), fraud/forgery, and vehicular offenses (e.g., DWI, driving after suspension).

Self-Report Measures

Boldness Questionnaire. The 153-item self-report Boldness Questionnaire (BQ; Patrick et al., 2009) used in the present study was developed using the process described in the Boldness Interview section, above. The scales of the BQ are essentially identical in content to the scales of the BI; total scores on the BQ were used in the present study.

Externalizing Inventory. The 159-item version of the Externalizing Inventory (Krueger, Markon, Patrick, Benning, & Kramer, 2007) is designed to assess both personality traits and behavioral markers of the externalizing psychopathology factor. It consists of 23 scales related to impulsivity, irresponsibility, rebelliousness, dishonesty, various forms of aggression, alcohol and drug use problems, and specific antisocial behaviors such as theft and fraud. Each item is rated on a scale of 1 (always false) to 4 (always true). Scores on this measure are associated with the trait dimensions of negative emotionality and disinhibition, as well as deficits in event-related brain potential response to performance errors in a laboratory task (Hall et al., 2007).

Multidimensional Personality Questionnaire—Brief Form. The Brief Form of the MPQ (MPQ-BF; Patrick, Curtin, & Tellegen, 2002) is a 155-item omnibus measure of normal-range personality traits that measures three temperament-based, higher order dimensions of personality: Positive Emotionality, consisting of the lower-order traits Well-Being, Social Closeness, Social Potency, and Achievement; Negative Emotionality, consisting of Stress Reaction, Alienation, and Aggression; and Constraint, which is

comprised of Control, Harm Avoidance, and Traditionalism. Each item consists of a statement which is rated on a scale of 1 (always false) to 4 (always true).

MPQ-Estimated Scores on PPI-1 and PPI-2. The PPI (Lilienfeld & Andrews, 1996) is a self-report measure of psychopathic personality traits that was designed using a personality-based approach and intended for use in noncriminal populations. Previous research by Benning et al. (2005a) has demonstrated that scores on the two factors of the PPI can be reliably and substantially predicted via multiple regression by the lower-order trait scales of the MPQ-BF (R's = .89 and .84 for PPI-1 and PPI-2, respectively). The factors of the PPI, when predicted in this way, mirror the correlates of directly-assessed PPI-1 and PPI-2 in community, undergraduate, and incarcerated samples (Benning et al., 2005a), supporting the validity of this approach to measuring psychopathic traits.

Narcissistic Personality Inventory. The 40-item Narcissistic Personality Inventory (NPI; Raskin & Hall, 1979) is intended to measure tendencies toward aggressive dominance, pathological egocentricity, and self-aggrandizement. It consists of seven subscales, including Authority, Exhibitionism, Superiority, Entitlement, Exploitativeness, Self-Sufficiency, and Vanity. Each item consists of a forced-choice pair of statements (e.g., "I am much like everybody else" vs. "I am an extraordinary person"). In addition to a variety of negative outcomes, scores on the NPI are associated with heightened confidence and self-esteem (Raskin, Novacek, & Hogan, 1991; Watson, Little, Sawrie, & Biderman, 1992) and social efficacy (Paulhus, 1998).

Sensation Seeking Scale—Thrill and Adventure Seeking. Zuckerman's (1979) Sensation Seeking Scale (SSS) measures tendencies to seek out novel and exciting activities. In particular, the Thrill and Adventure Seeking (TAS) subscale of the SSS,

which indexes tendencies toward sports and other activities that may involve danger or risk, appears to be most closely related to boldness or dispositional fearlessness (as opposed to sensation seeking related to behavioral disinhibition or boredom proneness). This 10-item measure consists of a series of paired statements that require test-takers to choose between attitudes reflecting aversion to risk (e.g., "I can't understand people who risk their necks climbing mountains") versus enjoyment of risk (e.g., "I often wish I could be a mountain climber"). Each item is rated on a scale of 1 (definitely A) to 4 (definitely B). Scores on the TAS scale are related to self-reports of engaging in risk-taking behaviors in a variety of contexts (Himmelstein & Thorne, 1985) and dangerous or adventurous recreational pursuits (Freixanet, 1991; Straub, 1982).

Tridimensional Personality Questionnaire—Harm Avoidance. The 34-item Harm Avoidance scale of Cloninger's (1987) Tridimensional Personality Questionnaire (TPQ) is designed to measure tendencies toward worry and pessimism, fear of uncertainty, lack of vigor, and social inhibition in the presence of strangers. Items are rated on a scale of 1 (always false) to 4 (always true). The Harm Avoidance trait dimension has also been interpreted as a measure of trait fearfulness; elevated scores are associated with high self-report trait anxiety (Jiang et al., 2003), obsessive-compulsive disorder (Lyoo, Yoon, Kang, & Kwon, 2003), social phobia (Pelissolo et al., 2002) and depression (Cloninger, Bayon, & Svrakic, 1998).

Emotionality-Activity-Sociability Temperament Survey—Fearfulness. Buss and Plomin's (1984) measure, the Emotionality-Activity-Sociability Temperament Survey (EAS), was designed to assess basic dimensions of variability in behavior that are evident within the first year of life and persist into adulthood. The 4-item EAS-Fear scale was

designed to assess a basic temperament style marked by fearfulness in a variety of situations (e.g., “When I get scared, I panic”), and should therefore be negatively correlated with boldness. Each item is rated on a scale of 1 (always false) to 4 (always true).

Fear Survey Schedule—III. The 52-item FSS-III (Wolpe & Lang, 1964) was developed to assess a number of specific phobic fears across multiple domains in clinical populations. For each item, test-takers rate how much fear they experience in a given situation (e.g., “dead people,” or “being in an elevator”) on a scale of 1 (not at all) to 5 (very much). Factor analyses have indicated that the specific fears assessed by the FSS-III consist of five categories, including fears relating to social situations, harmless animals and insects, medical procedures or bodily injury, sexual and aggressive scenes, and agoraphobic fears (Arrindell, 1980). Total scores on the FSS-III correlate positively with Eysenck’s Neuroticism dimension (Abdel-Khalek, 1988), and scores on the factors of the FSS-III accurately discriminate individuals with panic disorder from those with other anxiety disorders, although discrimination for other anxiety disorders is limited (Beck, Carmin, & Henninger, 1998).

Mood and Anxiety Symptoms Questionnaire—Short Form. The short form of the Mood and Anxiety Symptoms Questionnaire (MASQ; Watson & Clark, 1991) was developed to measure the three dimensions of the tripartite model of depression and anxiety (Clark & Watson, 1991). It consists of two subscales, Anhedonic Depression and Anxious Arousal, with remaining items reflecting non-specific or generalized distress. Each item consists of a symptom-relevant statement (e.g., “hands were shaky,” or

"blamed myself for a lot of things"), for which the test-taker rates how much they have experienced that symptom in the past week on a scale of 1 (not at all) to 5 (extremely).

Procedure

The study protocol consisted of three sessions, with each session taking place on a separate day, approximately a week apart. The packet of self-report questionnaire measures was completed across the three study days. In Session 1, participants were introduced to the lab environment, and the study procedures were thoroughly explained. After informed consent was obtained, the participant then completed the PCL-R interview. Following the first session, the interviewer reviewed the participant's institutional records needed to complete PCL-R ratings and to code for violent and non-violent criminal offenses.

In Session 2, participants completed the BI and modified SCID interviews. In order to maximize the independence of observations between the PCL-R and the BI (and thereby avoid inflated correlations between the measures due to halo effects or other interviewer biases), separate interviewers conducted these two interview sessions, and Session 2 interviewers were blind to the participant's PCL-R score. Following Session 2, the interviewer completed ratings for the BI and SCID measures. Both Sessions 1 and 2 were digitally videotaped, and a random subset of BI sessions (n = 54) were later reviewed and scored by a secondary rater trained by the measure's author (J.R.H.) for the purpose of inter-rater reliability analyses. All interviews (PCL-R, BI, and SCID) were performed by specially-trained staff who possessed at least a bachelor's-level degree in psychology.

The psychophysiological testing session took place in Session 3. During this session, participants were initially oriented to the laboratory equipment and procedures. After electrode placement and impedance checks were performed, participants completed the picture-viewing paradigm (see below) as part of a battery of psychophysiological testing that included additional affective and cognitive tasks not reported here. Following the psychophysiological testing session, participants completed any remaining questionnaires, and were then debriefed.

Picture-Viewing Paradigm

Stimuli for the picture-viewing paradigm consisted of 90 images drawn from the International Affective Picture System (IAPS; Center for the Study of Emotion and Attention, 1999), consisting of 30 aversive, 30 pleasant, and 30 neutral scenes[1]. Each affective valence category consisted of three image content categories (cf. Bernat et al., 2006). Pleasant pictures included 10 nurturant (babies and small animals), 10 erotic (attractive nude females and couples), and 10 adventure (thrill-seeking activities) scenes; aversive pictures included 10 threat (aimed guns and attacking animals), 10 mutilation (injured bodies, limbs, faces), and 10 victim (depicting others being attacked) scenes. The neutral scenes comprised a variety of images such as household objects, buildings, and neutral human faces. Affective valence categories were balanced such that the mean normative ratings of pleasantness for each category were equidistant from neutral, with equivalent mean normative ratings of arousal. Mean ratings of normative pleasantness and arousal (each on a scale of 1 to 9) for the three affective categories were as follows: pleasant – 7.59, 6.34; neutral – 5.01, 2.86; aversive – 2.58, 6.19.

Each image was presented for 6 s, followed by an inter-trial interval (ITI) of 12 s. Startle probes, with a 50 ms duration and 10 μs rise time, presented binaurally at a volume of 105 dB via Etymotics Research in-ear headphones, were delivered during the 6-s viewing period for 81 out of the 90 pictures. The probes occurred with equal frequency either 3, 4, or 5 s after picture onset (i.e., n = 27 for each probe onset time). For 6 of the remaining 9 pictures, startle probes were delivered during the ITI at either 1, 1.5, or 2 s following picture offset. The remaining 3 trials did not include startle probes. Preceding the main picture series in which responses were recorded, a practice series of three probed picture trials was presented in order to familiarize participants with the picture and startle probe stimuli, after which final instructions were given and the main task commenced.

Nine picture presentation orders (and nine reverse-order versions of those sequences) were used. Within and between orders, pictures and startle probes were counterbalanced such that all valence categories (pleasant, neutral, aversive) and image content categories (erotic, nurturant, adventure; threat, mutilation, victim) were represented equally across orders at each serial position, with the following constraints: no more than two pictures of the same valence occurred consecutively within any stimulus order; pictures of the same content category never appeared consecutively; and across orders, pictures were rotated so as to serve in both probed and unprobed trials.

Stimulus Presentation and Psychophysiological Data Acquisition

Participants were seated in a padded recliner in a dimly-lit testing room at a distance of 100 cm from a 21-in. CRT computer monitor, upon which picture stimuli were presented. Participants were simply instructed that they would be viewing a series

of pictures, and to view the images for the entire time they were on the screen. They were also advised that they would periodically hear loud noise clicks via earphones, which they could disregard. Stimulus presentation was controlled by an IBM-compatible computer running E-Prime software (MEL software Inc.). A second IBM-compatible computer running Neuroscan Acquire software controlled physiological data acquisition and synchronization with stimulus presentation.

Blink EMG responses to noise probes were measured using a pair of Med Associates 0.25 cm Ag–AgCl electrodes filled with electrolyte paste, positioned over the *orbicularis occuli* muscle under the left eye. Responses were recorded at a sampling rate of 1000 Hz using a Neuroscan Synamps amplifier with a 0.05-200 Hz bandpass analog filter applied prior to digitization to prevent aliasing (Blumenthal et al., 2005). Data were then digitally high-pass filtered at 10 Hz to remove artifacts due to movement (van Boxtel, Boelhouwer, & Bos, 1998). Signals were then rectified and integrated using a digital single-pole recursive filter (implemented using Matlab software; Mathworks, Inc.) to simulate a Coulbourn contour-following filter with a 30-ms time constant.

Data Reduction

The response to the first noise probe delivered in the task was discarded for each participant, as this initial response was disproportionately large compared with responses to subsequent probes (cf. Patrick et al., 1993). All trials were then visually inspected for excessive artifact (e.g., unstable baseline or spontaneous blink activity overlapping with the startle probe blink) or zero-amplitude responses (i.e., no discernible blink response). Trials with excessive artifact were omitted from further analyses (i.e., set to missing values), and zero-amplitude responses were set to a value of zero. Approximately 4.1%

of trials were set to missing, and 9.2% were scored as zero-amplitude responses. Participants with greater than 30% of trials scored either as missing or as zero-amplitude were omitted from further analyses; 15 participants were ultimately excluded in this manner. An additional 6 participants were excluded from analysis due to recording equipment malfunction or other procedural irregularities (e.g., participant falling asleep), yielding a total sample of n = 146 for startle measures.

The remaining startle blink responses were scored using an algorithm implemented in Matlab in which the maximum and minimum peaks recorded between 30 and 120 ms following the onset of the noise probe were determined relative to median EMG activity during the 50 ms prior to probe onset. Startle blink amplitude was then computed as the difference between the minimum and maximum peak values within the 30-120 ms response window. Given that raw startle magnitudes vary greatly from one individual to another, these raw values were then standardized across trials within subjects using a z-score transformation ($z = [\text{raw magnitude} - M_{all}] / SD_{all}$). These z-scores were then transformed to t-scores ($T = [\text{z-score} \times 10] + 50$), such that startle blink amplitude scores had a mean of 50 and a standard deviation of 10 for each participant.

Data Analysis

The first set of statistical analyses focused on evaluating the reliability, structure, and criterion-related validity of the BI measure. First, the scale reliability of the BI was evaluated using Cronbach's alpha statistic, computed separately for the items of the BI's ten constituent scales, and for the measure as a whole, treating each scale as an item. The inter-rater reliability of the BI was then examined using intraclass correlation coefficients for BI scale and total scores across primary and secondary raters. Next, the underlying

structure of the BI scales was explored using principal components analysis (PCA), with varimax rotation to facilitate interpretation. The criterion-related validity of the BI measure was evaluated using Pearson product-moment correlations between BI total scores and other study variables from the self-report, interview, and file information domains. In order to examine the relative contributions of boldness and externalizing (i.e., disinhibition) to PCL-R psychopathy, these analyses were followed by a series of regressions focusing on the extent to which total and factor scores of the PCL-R are predicted by the BI and the latent externalizing factor. Finally, in order to further summarize the relationships examined in this portion of the study, this set of analyses concluded with a PCA of several key variables from the present study.

In the second set of analyses, the role of dispositional fearlessness in the boldness and PCL-R psychopathy constructs was investigated by examining relationships between startle modulation variables and the BI and PCL-R. First, basic affective startle modulation effects were examined using multivariate analysis of variance, in which picture valence was entered as a within-subjects factor; planned linear and quadratic follow-up contrasts were used to clarify the overall effect of picture valence. Modulatory effects were then further examined in a series of dependent-samples t-tests comparing mean startle amplitude for each affective and content category with amplitude for neutral pictures.

In order to examine the relationship between boldness and affective startle modulation, both extreme group and continuous statistical approaches were utilized. Group effects were investigated by comparing the top and bottom quartiles of BI total scores in another multivariate analysis of variance, again using picture valence as a

within-subjects factor, but in this case with BI quartile group as a between-subjects factor. This analysis was followed-up with planned linear and quadratic contrasts to further elucidate main effects and interactions, as well as a series of independent-samples t-tests comparing high and low BI quartile groups on mean startle amplitude difference scores for affective and content picture categories versus neutral pictures. These analyses were followed by a series of simple effects t-tests examining patterns of startle modulation by valence and content among the two extreme groups separately. In order to replicate previous research on psychopathy and startle modulation, a parallel set of analyses followed using PCL-R psychopathy groups as the between-subjects variable. Following Hare's (1991, 2003) guidelines, total score cutoffs were used to create psychopathy groups; participants with PCL-R total scores at or above 30 were assigned to the "psychopath" group, and those participants with a total score of 20 or below were assigned to the "non-psychopath" group. Continuous relationships between boldness and startle modulation difference scores for affective and content picture categories were also examined in a series of Pearson product-moment correlations between these measures. The alpha criterion for all analyses was set at $p = .05$.

Chapter 3: Results

Descriptive Statistics and Reliability

The mean BI total score was 33.1, with a standard deviation of 6.9 and a range of 15.2 – 46.2. Results of reliability analyses examining the internal consistency and inter-rater reliability of the BI are presented in Table 2. All ten subscales of the BI demonstrated at least adequate internal consistency, with Chronbach's alpha values ranging from .64 (Optimism) to .90 (Glibness). Total BI scores demonstrated good internal consistency, with an overall Chronbach's alpha of .83 (treating each subscale score as an item). The subscales of the BI also exhibited adequate inter-rater reliability, as measured by intraclass correlations, with coefficients ranging from .69 (Self-Confidence) to .94 (Social Assurance). Inter-rater reliability for total scores on the BI was excellent, with an intraclass correlation coefficient of .92.

Inter-correlations among BI subscales and correlations between scale and total scores are presented in Table 3. Overall, correlations among subscales were all positive and most were statistically significant ($p < .01$). Inter-scale correlations ranged from a minimum of $r = .05$ (Optimism – Intrepidness) to a maximum of $r = .71$ (Glibness – Social Assurance). Scale-total score correlations were all positive and significant ($p < .001$), and ranged from $r = .50$ (Intrepidness) to $r = .77$ (Social Assurance). Table 3 also presents scale inter-correlations between the scales of the BI and those of the self-report BQ measure, which were also uniformly positive and generally strong and significant. Correlations between the BI scales and their BQ counterparts ranged from $r = .42$ (Resilience) to $r = .71$ (Social Assurance); total scores for the two instruments correlated at $r = .75$, $p < .001$.

Table 2. Boldness Interview scale and inter-rater reliability coefficients.

BI Scale	**Scale Reliability**	**Inter-rater Reliability**
Courage	.84	.87
Social Assurance	.87	.94
Self-Confidence	.85	.69
Glibness	.90	.92
Dominance	.84	.90
Persuasiveness	.81	.91
Intrepidness	.84	.83
Resilience	.78	.74
Optimism	.64	.78
Tolerance for Uncertainty	.71	.85
Total	.83	.92

Note: BI = Boldness Interview; *n* = 54 for inter-rater reliability estimates.

Table 3. Correlations among scales of the Boldness Interview and Boldness Questionnaire.

Boldness Scale	**1.**	**2.**	**3.**	**4.**	**5.**	**6.**	**7.**	**8.**	**9.**	**10.**	**11.**
1. Courage	*.53***	.31**	.34**	.27**	.19†	.19†	.37**	.47**	.33**	.37**	.45**
2. Social Assurance	.40**	*.71***	.40**	.56**	.49**	.41**	.17†	.42**	.35**	.50**	.57**
3. Self-Confidence	.45**	.60**	*.54***	.41**	.42**	.39**	.20†	.51**	.48**	.43**	.55**
4. Glibness	.25**	.71**	.50**	*.61***	.52**	.50**	.11	.28**	.29**	.43**	.53**
5. Dominance	.33**	.50**	.51**	.63**	*.65***	.46**	.20*	.41**	.39**	.46**	.57**
6. Persuasiveness	.21*	.40**	.33**	.51**	.57**	*.68***	.09	.22*	.24*	.30**	.50**
7. Intrepidness	.41**	.20*	.20*	.19†	.30**	.25**	*.61***	.25**	.22*	.33**	.38**
8. Resilience	.41**	.41**	.53**	.29**	.32**	.15†	.16†	*.42***	.35**	.32**	.40**
9. Optimism	.26**	.38**	.57**	.29**	.32**	.23*	.05	.45**	*.52***	.37**	.45**
10. Tolerance for Uncertainty	.37**	.48**	.36**	.40**	.38**	.29**	.39**	.26**	.31**	*.64***	.57**
11. Total	.60**	.77**	.76**	.74**	.75**	.62**	.50**	.59**	.56**	.64**	*.75***

Note: Values on the diagonal (in italics) reflect correlations between Boldness Interview scales and their Boldness Questionnaire counterparts. Coefficients to the left of the diagonal reflect inter-correlations among Boldness Interview scales; coefficients to the right of the diagonal reflect correlations between the Boldness Interview and Boldness Questionnaire scales. ** = $p < .001$, * = $p < .01$, † = $p < .05$.

Structure of Boldness Interview Scales

In order to examine the underlying structure of the BI scales, an exploratory PCA was performed. Three components with eigenvalues greater than 1.00 (4.40, 1.26, and 1.14), explaining 68.0% of the total variance, were extracted; visual inspection of the scree plot suggested that either a one- or three-factor solution would provide the best fit to the data. The dominant first factor, upon which all scales demonstrated substantial factor loadings (ranging from .40 – .80) in the initial unrotated factor solution, explained 43.9% of the total variance in BI scale scores; the two residual factors explained 12.6% and 11.4% of the remaining variance, but were not readily interpretable. Thus, the initial factor solution was submitted to varimax rotation, in order to increase the interpretability of the extracted factors; results are presented in Table 4.

In this rotated solution, the first factor (BI-Social, explaining 27.1% of total variance) reflected social poise, efficacy, and dominance; Glibness, Persuasiveness, Dominance, and Social Assurance all exhibited their primary loadings on this factor, with Self-Confidence and Tolerance for Uncertainty demonstrating weaker, secondary loadings. The second factor (BI-Stress, explaining 24.0% of total variance) reflected resilience, confidence, and relative immunity to life stress; the scales Resilience, Optimism, and Self-Confidence all demonstrated primary loadings on this factor, while Social Assurance and Courage exhibited lesser secondary loadings. The third factor (BI-Fear, explaining 16.9% of total variance) related to trait indicators of fearlessness, such as staying calm in the face of threat, sensation-seeking, and tolerance/preference

Table 4. Principal components analysis (with varimax rotation) of Boldness Interview scales.

BI Scale	BI-Social	BI-Stress	BI-Fear
Glibness	**.84**	--	--
Persuasiveness	**.79**	--	--
Dominance	**.75**	--	--
Social Assurance	**.65**	.48	--
Resilience	--	**.80**	--
Optimism	--	**.78**	--
Self-Confidence	.40	**.73**	--
Intrepidness	--	--	**.89**
Courage	--	.46	**.69**
Tolerance for Uncertainty	.41	--	**.52**

Note: Primary loadings are noted in bold; loadings less than .35 have been suppressed.

BI = Boldness Interview.

for novel, unpredictable, or dangerous situations; Intrepidness, Courage, and Tolerance for Uncertainty all demonstrated substantial primary loadings on this factor, with no significant secondary loadings.

Interview and File-Based Measures

PCL-R. As presented in Table 5, BI total scores demonstrated significant correlations with several variables derived from the PCL-R. As predicted, BI total scores correlated positively with PCL-R total and Factor 1 scores, and most strongly with the Interpersonal facet of Factor 1. Interestingly, BI total scores also demonstrated a positive correlation with Factor 2, due primarily to a significant relationship with the Antisocial facet. As this was unexpected, additional correlational analyses were conducted using standardized component scores on the three BI factors (computed using the regression method, in which scores reflect sums of beta-weighted values for constituent scales) in order to better understand the relationship between BI total scores and the PCL-R measures. These analyses revealed that BI-Social (reflecting social poise, dominance, and efficacy) correlated positively with PCL-R total scores, as well as both factors and the Interpersonal, Lifestyle, and Antisocial facets; however, BI-Social clearly related preferentially to the Interpersonal facet. BI-Stress (reflecting resilience, stress-immunity, and confidence), on the other hand, demonstrated a weak but significant negative correlation with the Lifestyle facet. BI-Fear (reflecting diminished reactivity to threat and tolerance of uncertainty or danger) correlated positively with PCL-R total scores, Factor 2, and the Antisocial facet. Thus, to the extent that BI total scores are related to the Antisocial facet of PCL-R Factor 2, this is likely due primarily to the fearless/sensation-seeking component of the BI.

Table 5. Boldness Interview correlations with scales of the Psychopathy Checklist – Revised.

PCL-R Scale	BI - Total	BI - Social	BI - Stress	BI – Fear
Factor 1	**.34****	**.29****	.10	.12
Interpersonal	**.45****	**.43****	.14	.09
Affective	.15†	.07	.04	.13
Factor 2	.25*	.23*	-.06	.18†
Lifestyle	.12	.19*	-.15†	.08
Antisocial	**.27****	.17†	.06	.20*
Total	**.35****	**.30****	.05	.17†

Note: PCL-R = Psychopathy Checklist – Revised; BI = Boldness Interview. ** = $p < .001$, * = $p < .01$, † = $p < .05$.

DSM-IV Externalizing Psychopathology and Offense Data. Table 6 presents findings from correlational analyses examining links between BI total scores and indicators of externalizing, including APD, CD, and alcohol/substance/nicotine dependence symptom counts. As in prior research (Krueger et al., 2002), these diagnostic measures all loaded substantially on a dominant single factor from a PCA using varimax rotation. Scores on this latent externalizing factor, reflecting the shared variance among these diagnostic variables, were computed via the regression method and also examined in relation to BI total scores. As predicted, boldness was not substantially related to any of the lower-order symptom count variables or the higher-order externalizing factor. However, weak positive correlations with APD and CD symptoms were noted, as well as a modest negative correlation with symptoms of alcohol dependence. Additionally, relationships between BI total scores and official offense data coded from prison files were examined. As described in the Method section above, offense data were coded in terms of two variables: number of convictions for violent crimes, and number of convictions for non-violent crimes. Consistent with prediction, total scores on the BI did not correlate significantly with either measure.

Boldness, Externalizing, and PCL-R Psychopathy. The preceding correlational analyses were followed by a series of three regression analyses to examine the unique contributions of interview-assessed boldness and externalizing to the PCL-R psychopathy phenotype. Total scores on the BI and latent externalizing factor scores were entered simultaneously as predictors of PCL-R total and factor scores in a series of three regression analyses. Results are presented in Table 7. In the first model, both

Table 6. Boldness Interview correlations with symptoms of DSM-IV externalizing disorders and criminal offense data.

Externalizing Measure	**BI - Total**
Adult Antisocial Behavior	.17†
Conduct Disorder	.15†
Alcohol Dependence	-.16†
Substance Dependence	-.08
Nicotine Dependence	-.10
Externalizing Factor Score	.03
Violent Offenses	.09
Non-violent Offenses	.05

Note: BI = Boldness Interview. ** = $p < .001$, * = $p < .01$, † = $p < .05$.

Table 7. Regression analyses predicting Psychopathy Checklist – Revised total and factor scores by Boldness Interview total scores and externalizing factor scores.

PCL-R Scale	R	BI Beta	EXT Beta
Total	.499	**.330****	**.364****
Factor 1	.373	**.331****	.162†
Factor 2	.541	.220*	**.488****

Note: PCL-R = Psychopathy Checklist – Revised; BI = Boldness Interview; EXT = externalizing factor score. ** = $p < .001$, * = $p < .01$, † = $p < .05$.

boldness and externalizing contributed uniquely and comparably to the prediction of PCL-R total scores, with a strong overall prediction model, $F(2, 180) = 29.81$, $p < .001$, and a relatively high percentage of total variance (approximately 24.9%) accounted for. In the second model, both boldness and externalizing contributed uniquely to the prediction of PCL-R Factor 1, although boldness was notably stronger, with a standardized beta more than twice that of externalizing. The overall prediction model was again significant, $F(2, 180) = 14.51$, $p < .001$, with approximately 13.9% of variance accounted for. In the third model, both BI and externalizing scores contributed significantly as unique predictors of PCL-R Factor 2, although the beta weights were again very asymmetric, this time with externalizing as the stronger predictor. The overall prediction model was very strong, $F(2, 180) = 37.29$, $p < .001$, with a high percentage of overall variance accounted for (approximately 29.3%) by these two variables.

Self-Report Measures

Total scores on the BI were examined in relation to self-report measures of personality traits theoretically and/or empirically related to the phenotypic boldness construct; results are presented in Table 8. As predicted, the BI correlated positively with total scores on the self-report BQ measure, PPI total scores, PPI-1, NPI total scores, and scores on the Thrill-Adventure Seeking scale of the SSS. Also as predicted, BI total scores correlated negatively with the Harm Avoidance scale of the TPQ, the Distress – Fear scale of the EASI, and total scores on the FSS and MASQ – Short Form. In addition, the BI was unrelated to scores on the Externalizing Inventory and PPI-2, which is also consistent with prediction.

Table 8. Boldness Interview correlations with self-report personality and symptom measures.

Self-Report Measure	BI Total
Boldness Self-Report Form	**.75****
Externalizing Inventory	.10
PPI – Total	**.42****
PPI – 1	**.68****
PPI – 2	-.05
NPI – Total	**.42****
SSS – Thrill Seeking	**.32****
TPQ – Harm Avoidance	**-.65****
EASI – Fear	**-.50****
FSS – Total	**-.44****
MASQ – Total	**-.36****

Note: PPI = Psychopathic Personality Inventory; NPI = Narcissistic Personality Inventory; SSS = Sensation Seeking Scale; TPQ = Tridimensional Personality Questionnaire; EASI = Emotionality-Activity-Sociability Temperament Survey; FSS = Fear Survey Schedule; MASQ = Mood and Anxiety Symptom Questionnaire – Short Form. ** = $p < .001$, * = $p < .01$, † = $p < .05$.

Table 9. Boldness Interview correlations with scales of the Multidimensional Personality Questionnaire – Brief Form.

MPQ-BF Scale	BI - Total
Positive Emotionality	**.59****
Social Potency	**.57****
Achievement	**.32****
Social Closeness	**.36****
Well-Being	**.39****
Negative Emotionality	-.09
Stress Reaction	**-.31****
Aggression	.10
Alienation	-.17†
Constraint	-.11
Harm Avoidance	-.23*
Control	.04
Traditionalism	-.04

Note: MPQ-BF = Multidimensional Personality Questionnaire – Brief Form; BI = Boldness Interview. ** = $p < .001$, * = $p < .01$, † = $p < .05$.

The BI was also examined with regard to its correlates from an omnibus measure of normal-range personality traits, the MPQ-BF. As shown in Table 9, BI total scores related strongly to the higher-order dimension of Positive Emotionality, and demonstrated significant positive correlations with all of its constituent lower-order scales, particularly Social Potency (reflecting tendencies toward leadership and interpersonal dominance), but also Achievement (reflecting diligence and motivation for success), Social Closeness (reflecting sociability and enjoyment of social interaction), and Well-Being (reflecting general tendencies to experience positive affect). Total BI scores also correlated negatively with the lower-order traits Stress Reaction (reflecting tendencies toward worry and rumination) and Alienation (reflecting distrust of others and blame externalization) from the Negative Emotionality higher-order dimension, and Harm Avoidance (reflecting tendencies to avoid risk in favor of predictable or familiar situations) from the higher-order dimension of Constraint.

Integration: PCA of Key Interview and Self-Report Measures

In order to summarize and further clarify the network of relationships among individual difference measures examined in this study, a PCA with varimax rotation was conducted using key variables from both interview and self-report domains. Specifically, this analysis included interview and self report measures of psychopathy factors (PCL-R; PPI), boldness (BI; BQ), and externalizing (latent externalizing factor; Externalizing Inventory). Two factors with eigenvalues greater than 1.00 (2.97, 2.01), accounting for 62.4% of the variance, were initially extracted. Visual inspection of the scree plot further supported extraction of two factors. The two factors were then submitted to varimax rotation to enhance interpretability; the results are presented in

Table 10. Principal components analysis of boldness, externalizing, and psychopathy factor scales from interview and self-report domains.

Variable	PC-1	PC-2
Boldness Self-Report	**.90**	--
Boldness Interview	**.89**	--
PPI-1	**.87**	--
Externalizing Inventory	--	**.83**
Externalizing Factor	--	**.81**
PCL-R Factor 2	--	**.75**
PPI-2	--	**.51**
PCL-R Factor 1	.39	**.45**

Note: Primary loadings are noted in bold; loadings less than .35 have been suppressed.

PPI = Psychopathic Personality Inventory; PCL-R = Psychopathy Checklist – Revised.

Table 10. The first factor, with substantial loadings from BQ and BI total scores, as well as PPI-1, clearly reflected the boldness construct. The second factor, with substantial loadings from the Externalizing Inventory, externalizing component scores, PCL-R Factor 2, and PPI-2, clearly reflected tendencies toward externalizing and general disinhibition. Interestingly, PCL-R Factor 1 cross-loaded significantly on both factors.

Boldness, Psychopathy, and Startle Modulation

Effects of Emotional Valence and Content. Consistent with prior research, multivariate analysis of variance revealed a significant main effect of picture valence on startle blink amplitude, $F(2, 143) = 48.42$, $p < .001$ (see Figure 1). A follow-up linear contrast indicated that aversive pictures were associated with greater startle blink amplitude than pleasant pictures, $F(1,144) = 81.86$, $p < .001$. Paired samples t-tests indicated that startle amplitude for pleasant pictures was significantly inhibited relative to neutral, $t(144) = -8.17$, $p < .001$, and that each of the pleasant content categories demonstrated significant startle inhibition: erotic, $t(143) = -9.57$; nurturant, $t(144) = -4.32$; action, $t(143) = -3.57$, all p's $< .001$ (see Figure 2). However, unlike prior research, aversive pictures overall were not significantly potentiated relative to neutral, $t(144) = 0.52$, $p > .05$, nor were any of the aversive content categories: threat, $t(144) = 1.35$; mutilation, $t(143) = 1.56$; victim, $t(144) = -1.92$, all p's $> .05$.

Boldness, PCL-R Psychopathy, and Startle Modulation by Emotional Valence and Content. Quartile splits on BI total scores were used to assign study participants to high and low boldness groups. Thus, individuals scoring at or above 38.8 were assigned to the high-BI group ($n = 37$), while participants scoring below 28.1 were

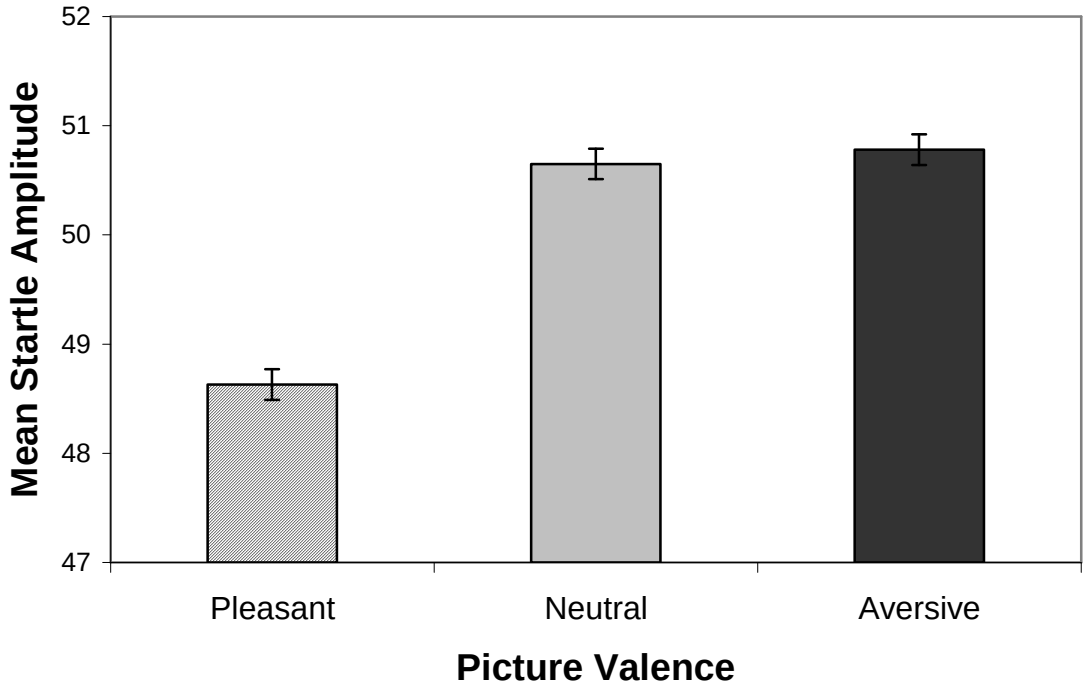

Figure 1. Mean startle blink amplitude by picture valence. Values plotted are t-scores, with a mean of 50 and standard deviation of 10. Error bars represent standard error of the mean for each valence category. Data plotted are for the overall sample, *n* = 146.

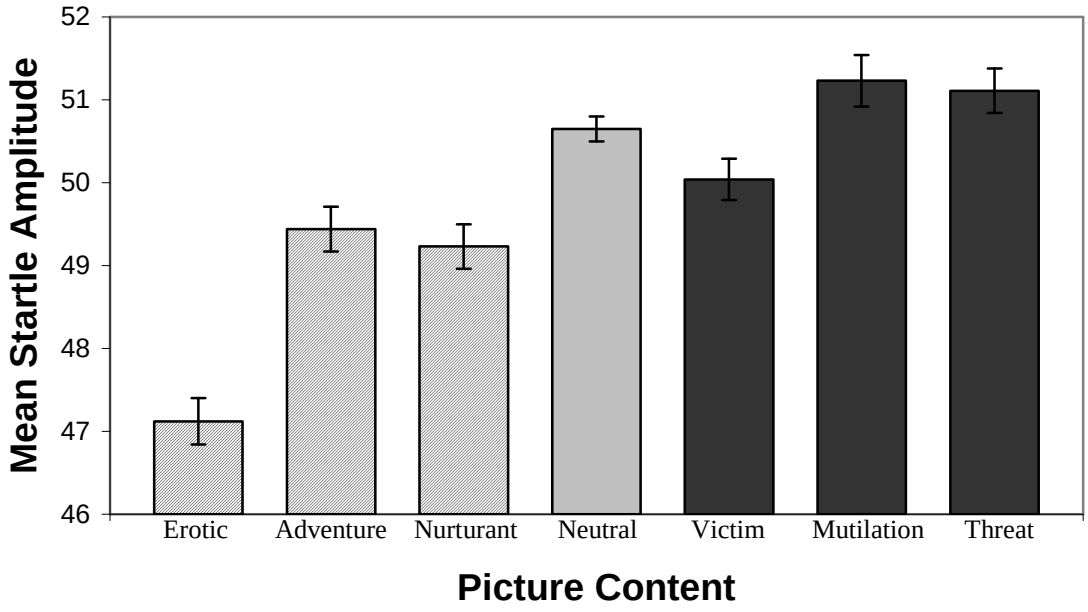

Figure 2. Mean startle blink amplitude by picture content category. Values plotted are t-scores, with a mean of 50 and standard deviation of 10. Error bars represent standard error of the mean for each content category. Data plotted are for the overall sample, *n* = 146.

assigned to the low-BI group (n = 32); note that group n's were unequal because quartile values were based on data for the sample as a whole, and not the subset of participants who completed psychophysiological testing. A multivariate analysis of variance, with picture valence as a within-subjects factor and BI group as a between-subjects factor, revealed a significant Group x Valence interaction, $F(2,66) = 4.06$, $p < .05$ (see Figure 3). A significant quadratic contrast, $F(1,67) = 6.02$, $p < .05$, indicated that this interaction resulted from a stronger quadratic pattern of startle modulation (with both aversive and pleasant pictures inhibited relative to neutral) in the high-BI group.

These analyses were followed by independent samples t-tests directly comparing high and low BI quartile groups on mean startle amplitude difference scores, computed as the mean difference between startle amplitude for pictures of each type minus the amplitude for neutral pictures. Compared to the low-BI group, the high-BI group demonstrated reduced startle potentiation (relative to neutral) for aversive pictures overall, $t(67) = 2.87$, $p < .01$, and for victim pictures in particular, $t(67) = 3.18$, $p < .01$. Simple effects paired samples t-tests revealed that the low-BI group demonstrated significant startle potentiation for aversive pictures overall, $t(31) = 2.45$, $p < .05$, and for threat pictures, $t(31) = 2.04$, $p < .05$, as well as nominal but non-significant potentiation for mutilation and victim scenes, ts(31) = 1.53 and 1.63, both p's > .05. In contrast, the high-BI group exhibited significant startle *inhibition* for victim pictures, $t(36) = -3.08$, $p < .01$, and no effects for aversive pictures overall, $t(36) = -1.54$, or for threat, $t(36) = -.03$, or mutilation pictures, $t(35) = -.52$ (all p's > .05).

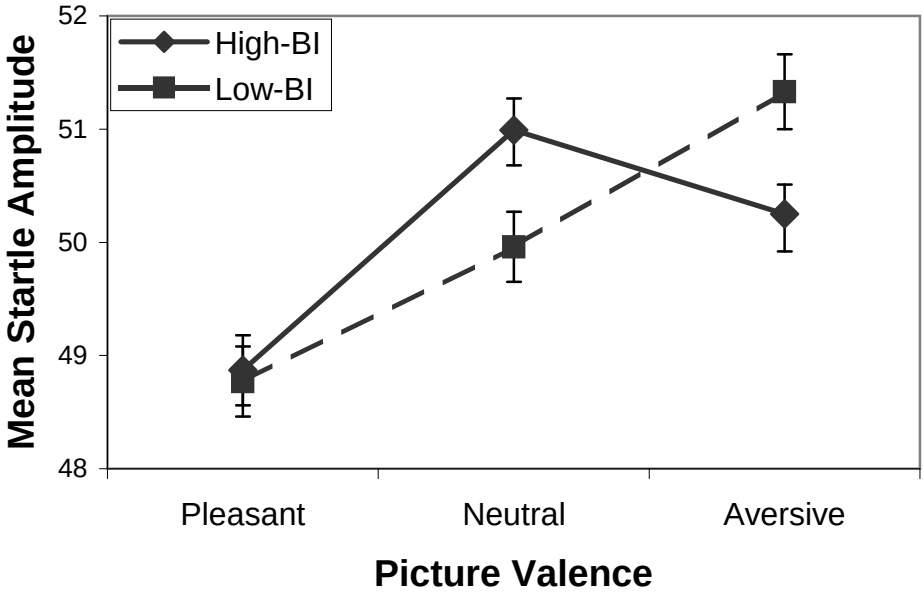

Figure 3. Mean startle blink amplitude by picture valence and Boldness Interview (BI) Quartiles. Values plotted are t-scores, with a mean of 50 and standard deviation of 10. Error bars represent standard error of the mean for each valence category. Data plotted are for the high-BI quartile group (solid lines; n = 37) and the low-BI quartile group (dashed lines; n = 32).

In order to replicate previous work demonstrating reduced startle potentiation for aversive pictures among psychopaths, a multivariate analysis of variance was performed using picture valence as a within-subjects factor, and psychopathy group (psychopath vs. non-psychopath) as a between-subjects factor. The two groups consisted of 47 psychopaths and 29 non-psychopaths, defined on the basis of cutoff scores recommended by Hare (1991, 2003) and described above. This analysis revealed a significant Group x Valence interaction, $F(2,73) = 3.85$, $p < .05$ (see Figure 4). A significant linear contrast, $F(1,74) = 7.67$, $p < .01$, indicated that the two groups differed primarily in terms of differences in startle amplitude between aversive and pleasant pictures. Follow-up independent samples t-tests failed to reveal any significant differences between psychopaths and non-psychopaths in mean startle amplitude difference scores, although there was a non-significant trend for reduced startle potentiation, relative to neutral, for aversive pictures overall in the psychopath group, $t(74) = 1.78$, $p < .10$. Simple effects paired samples t-tests indicated that neither psychopaths nor non-psychopaths evidenced significant startle potentiation for aversive pictures overall, or for any of the aversive content categories.

Correlational analyses were also performed in order to further examine the relationships between boldness and emotional startle modulation; results are presented in Table 11. For the following analyses, difference scores (reflecting mean differences in startle amplitude between affective picture categories and neutral pictures) were utilized. In an effort to better understand the relationship between the boldness construct and startle modulation, scores on the 3 BI factors were also included in the analyses. As predicted, total scores on the BI correlated negatively with overall

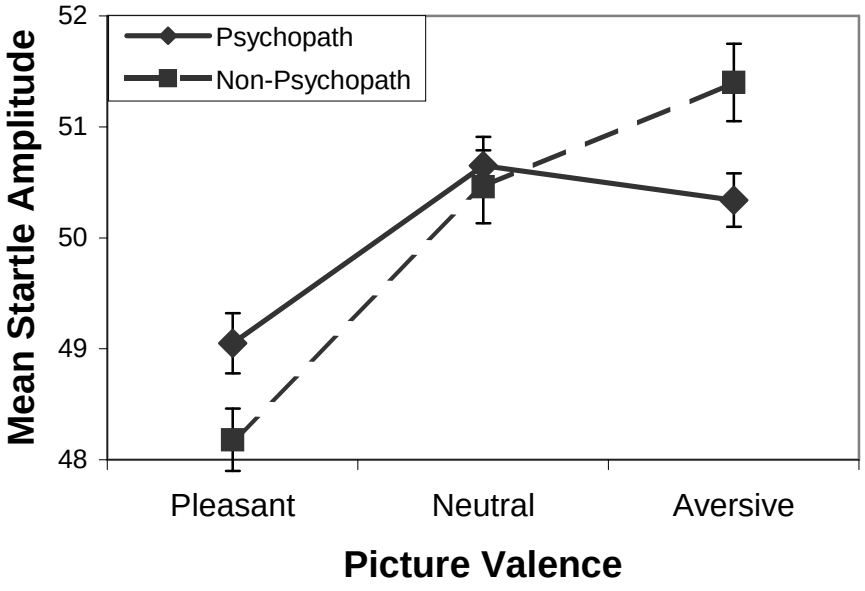

Figure 4. Mean startle blink amplitude by picture valence and psychopathy group. Values plotted are t-scores, with a mean of 50 and standard deviation of 10. Error bars represent standard error of the mean for each valence category. Data plotted are for the psychopathic group (solid lines; n = 47) and the non-psychopathic group (dashed lines; n = 29).

Table 11. Boldness Interview correlations with startle blink reflex modulation by picture valence and content.

Startle Measure	BI - Total	BI - Social	BI - Stress	BI – Fear
Aversive	-.24*	-.15	-.08	-.24*
Threat	-.12	-.08	.02	-.22†
Mutilation	-.14	-.16	-.02	-.06
Victim	-.25*	-.07	-.18†	-.24*
Pleasant	-.06	-.08	.05	-.14
Erotic	-.01	-.10	.10	-.01
Adventure	-.02	.01	.03	-.15
Nurturant	-.13	-.09	-.05	-.17

Note: BI = Boldness Interview. ** = $p < .001$, * = $p < .01$, † = $p < .05$.

aversive-neutral difference scores, and with victim-neutral difference scores in particular; a non-significant trend ($p < .10$) for reduced mutilation-neutral difference scores was also observed. Scores on BI-Social were not significantly related to startle modulation, although there were trend-level ($p < .10$) negative correlations with overall aversive-neutral and mutilation-neutral difference scores. The BI-Stress factor was negatively correlated with victim-neutral difference scores. Scores on the BI-Fear factor were negatively related to overall aversive-neutral and to victim-neutral and threat-neutral difference scores, and demonstrated trend-level negative correlations with nurturant-neutral ($p < .10$), and adventure-neutral ($p < .10$) difference scores – indicating enhanced startle inhibition for these content categories, relative to neutral. When the three BI factors were entered simultaneously in a regression model predicting overall aversive-neutral difference scores, both BI-Fear, $\beta = -.25$, $p < .01$, and BI-Social $\beta = -.17$, $p < .05$, contributed uniquely to prediction of reduced startle modulation. The overall prediction model was significant, $R = .297$, $F(2,142) = 4.42$, $p < .01$), with approximately 8.8% of variance accounted for.

Finally, in order to examine the relative predictive contributions of boldness and PCL-R psychopathy to startle modulation for aversive pictures overall, two regression analyses were performed. In the first regression model, BI and PCL-R total scores were entered simultaneously as predictors of aversive-neutral difference scores. BI was a significant unique predictor of reduced startle modulation for aversive pictures, $\beta = -.21$, $p < .05$, while PCL-R total scores did not contribute uniquely to prediction. The overall model was significant, $F(2,142) = 4.96$, $p < .01$, with approximately 6.5% of variance accounted for. In light of prior research demonstrating that PCL-R Factor 1 is

preferentially associated with diminished startle modulation for aversive stimuli, a second regression model, in which BI total scores and Factor 1 scores were entered simultaneously as predictors of aversive-neutral difference scores, was performed. This overall prediction model was significant, $F(2,142) = 4.81$, $p < .01$, with approximately 6.3% total variance explained. Again, BI total scores were significant and unique predictors of aversive startle modulation, $\beta = -.21$, $p < .05$, while PCL-R Factor 1 was not a significant predictor.

Chapter 4: Discussion

Construct Validity of the Boldness Interview

The triarchic model of psychopathy (Patrick et al., in press) conceptualizes this complex construct in terms of three distinct elemental phenotypes: disinhibition, meanness, and boldness. Whereas phenotypic disinhibition and meanness are well-represented in the PCL-R, the construct of boldness appears to be tapped only indirectly, and to a modest degree, by this instrument. This is in spite of the fact that the PCL-R was ostensibly intended to capture the psychopathy construct described by Cleckley, who placed emphasis on boldness as one of the key elements that distinguishes psychopathy from general criminal deviance. Although PPI-1 and other self-report measures seem to index boldness more directly, there are currently no validated interview-based instruments for directly assessing phenotypic boldness. In addition to its historical relevance to the psychopathy construct, the boldness dimension is of potential importance to the assessment and conceptualization of successful (non-criminal) psychopathy. Thus, the aim of the present study was to evaluate the construct validity of the Boldness Interview, the development of which proceeded from ongoing research on the construct of boldness in the self-report domain (Patrick et al., 2009).

Overall, findings from the present study strongly support the construct validity of the BI as a measure of phenotypic boldness. First, the BI demonstrated adequate internal consistency, and excellent inter-rater reliability, on par with the PCL-R. Although the structure of the BI scales was characterized by a dominant first factor upon which all scales loaded substantially, interpretable sub-factors reflecting the content areas of social dominance, immunity to life stress, and fearlessness/novelty-

seeking were identified. Both the BI factor and total scores demonstrated strong convergent and discriminant validity with external variables in a manner consistent with prediction and theory. As predicted, BI total scores demonstrated robust positive correlations with boldness assessed directly in the self-report domain, as well as PPI-1 and measures of social dominance, narcissism and sensation-seeking. Also consistent with prediction, scores on the BI demonstrated strong negative correlations with self-report measures of trait anxiety, harm avoidance, fears, and internalizing symptoms. In general, the BI was found to be unrelated to externalizing tendencies, whether measured by self-report or by diagnostic interview. However, relatively modest positive correlations with APD and CD symptoms were observed (discussed in further detail below), as was as a modest negative correlation with symptoms of alcohol dependence. Thus, consistent with Patrick and colleagues' account of the boldness construct, the BI was clearly associated with a dominant, socially poised, and efficacious interpersonal style, high positive affect and self-confidence, resilience to the psychological impact of life stress, and a preference for novelty and excitement over routine.

With regard to PCL-R psychopathy, BI total scores correlated significantly with most PCL-R variables, but preferentially with the Interpersonal facet of Factor 1, as predicted. The unique variance in the Interpersonal facet has previously been linked to variables consistent with boldness, such as social dominance, low anxiety, and relatively adaptive psychosocial functioning (Hall et al., 2004), suggesting that this component of PCL-R psychopathy may tap the boldness dimension to some extent, albeit indirectly. However, the items of the Interpersonal facet, particularly those reflecting deceitfulness and manipulation of others, clearly measure a more deviant

manifestation of boldness than that measured by the BI or PPI-1. Interestingly, total scores on the BI also demonstrated a substantial relationship with the Antisocial facet of PCL-R Factor 2, and contributed uniquely to prediction of overall Factor 2 scores (independent of externalizing) in a regression model. Although not of the same magnitude as BI's relationship to the Interpersonal facet, these findings were both noteworthy and unexpected, given that boldness is theoretically unrelated to disinhibition or externalizing tendencies. As noted above, BI total scores also evidenced modest positive correlations with DSM-IV symptoms of APD and CD.

What might account for this observed (and counter-theoretical) relationship? It is possible that, in a sample such as this one where mean levels of disinhibition are so high, phenotypic boldness (and the fearless genotypic disposition thought to underlie it) may be expressed in behaviorally deviant ways. In particular, the novelty/sensation-seeking tendencies associated with boldness, in the context of high behavioral disinhibition, may take the form of antisocially deviant behaviors. Thus, the antisocial behaviors of a high-BI individual may be motivated more by a desire for thrill and excitement, as opposed to cruelty or deficient behavioral control. Furthermore, the dominance and persuasiveness components of boldness, in a high-externalizing individual, might also be expressed antisocially (e.g., through conning or manipulation). This notion is supported by data from the present study, which indicate that the correlation between BI total scores and the PCL-R Antisocial facet was driven by the BI-Fear (reflecting calm in the face of threat, sensation-seeking, and novelty preference) and BI-Social (reflecting social poise, efficacy, and dominance) subfactors.

Nevertheless, when evaluated via factor analysis, boldness and externalizing (measured via self-report and interview) were clearly separable into two orthogonal factors. This suggests that, in terms of core dispositional factors, these two phenotypic constructs are largely distinct from one another. Interestingly, whereas PCL-R Factor 2 was more clearly aligned with the externalizing/disinhibition factor in this PCA, Factor 1 cross-loaded significantly on both. In a similar vein, regression analyses in the present study indicated that externalizing was a significant independent predictor of Factor 1 scores. These findings are consistent with previous research suggesting that both factors of the PCL-R are fairly saturated with externalizing tendencies (Patrick et al., 2007), and highlight the notion that PCL-R Factor 1 is a somewhat heterogeneous construct, reflecting the confluence of meanness/boldness and relatively high levels of externalizing.

Boldness, PCL-R Psychopathy, and Emotional Modulation of the Startle Reflex

In addition to evaluating the construct validity of the BI using self-report and interview measures, the present study examined relationships between the newly-developed BI measure and emotional modulation of the startle blink reflex. Potentiation of the acoustic startle blink while viewing aversive pictures is a well-validated index of fear reactivity, with a known neurobiological substrate involving input from the amygdala to the brainstem startle circuit. Deficits in startle potentiation have also been reliably linked to psychopathy, and its interpersonal-affective features (i.e., PCL-R Factor 1, PPI-1) in particular, across a variety of samples. From this perspective, emotional startle modulation not only provides a means of investigating the

neurobiological underpinnings of boldness, but also speaks to the construct validity of the BI measure, given the reliability of previous findings.

Consistent with prediction, and in a replication of findings from Benning et al. (2005), total scores on the BI (and the BI-Fear subfactor in particular) were associated with reduced startle potentiation during aversive pictures in the present study. This deficit in startle potentiation was particularly evident for victim images (depicting people being injured or attacked by others). In fact, group analyses comparing top and bottom BI quartiles indicated that the high-BI group actually demonstrated a pattern of significant startle *inhibition* when viewing these pictures, and an absence of significant potentiation for other aversive contents. The low-BI group, in contrast, exhibited a normal pattern of startle potentiation for aversive pictures overall, and for pictures depicting direct threat to the viewer (e.g., looming attackers, aimed weapons, attacking animals) in particular. This finding is consistent with Levenston et al. (2000), who found evidence of startle inhibition in response to victim pictures among incarcerated PCL-R psychopaths. A potential explanation for this finding may be that victim pictures constitute a more motivationally ambiguous cue than threat pictures, insofar as attack is being directed at another, rather than toward the viewer. From the perspective of the threat imminence model (cf. Cuthbert, Bradley, & Lang, 1996), victim pictures signal that a threat may be present in the immediate environment, but conveys some degree of uncertainty about the likelihood of actual danger to self. In a relatively fearless individual, this type of stimulus may be insufficient to prompt a shift from attentional orienting (which is associated with inhibition of startle) to defensive activation (and potentiation of startle). Of note, Vaidyanathan, Patrick, and Bernat

(2009) recently found evidence of deficits in startle potentiation specifically for threat pictures in association with a multivariate index of low trait fear among undergraduate males and females. Correlational analyses in the present study found a similar effect for the BI-Fear subfactor, which is conceptually similar to the multivariate trait fear measure utilized by Vaidyanathan and colleagues. This suggests that the sensation-seeking and "calm-under-pressure" aspects of boldness may be specifically related to diminished fear reactivity when directly confronted with threat.

The present study also examined startle modulation effects in relation to PCL-R psychopathy. Consistent with prior research, comparisons involving psychopathic and non-psychopathic groups revealed a pattern of reduced startle potentiation for aversive pictures among psychopaths; however, this effect was only present at a trend level in direct comparisons. Follow-up regression analyses examining the relative contributions of PCL-R psychopathy and the BI to aversive startle modulation found that boldness was a significant independent predictor of reduced startle potentiation for aversive pictures; PCL-R total and Factor 1 scores, however, were not significant after controlling for BI. This finding suggests that, to the extent that PCL-R psychopathy is associated with reduced startle potentiation for aversive pictures in this sample, this effect is at least partially mediated by phenotypic boldness as measured by the BI.

Implications for Assessment and Conceptualization of Psychopathy

Findings from the present study have three significant implications for the assessment and conceptualization of psychopathy. First, the present findings highlight the importance of boldness and associated features related to adaptive psychological functioning in the nomological network of psychopathy. Not only did the BI

demonstrate substantial correlations with the PCL-R, but it was also related to diminished physiological reactivity to fear, which has long been considered a key empirical correlate of psychopathy and possible etiologic substrate of the disorder. Furthermore, analyses presented here hint that boldness may in fact account for previously-observed relationships between PCL-R psychopathy and deficient startle potentiation to aversive emotional cues, although these findings will clearly require replication.

Second, as noted above, the boldness construct may be of particular relevance as a means of conceptualizing non-criminal psychopathy. Boldness is both theoretically and empirically linked to psychopathy, but essentially unrelated to externalizing tendencies. Thus, the individual who is high in boldness but low in externalizing or disinhibition may be the prototypical successful psychopath, who exhibits core personality traits associated with the disorder but who refrains from serious antisocial behavior. Prior to widespread use of the PPI, operationalizations of successful psychopathy in community studies were often problematic due to reliance on measures that confounded boldness or meanness with disinhibition and externalizing, resulting in samples that were of questionable distinctiveness from incarcerated samples. Notably absent from early research in this area were relatively high-functioning non-criminal psychopaths like those described by Cleckley. More recently, researchers have increasingly made use of the PPI to measure psychopathic traits in undergraduate and community research, which has facilitated disaggregation of the interpersonal-affective and antisocial deviance features in these settings. Findings from the present study suggest that the BI may profitably serve as an interview-based counterpart to PPI-1 (and

the newly-developed self-report boldness measure used here) as a way to reliably and validly operationalize successful psychopathy.

Finally, phenotypic boldness is just one component of the triarchic model of psychopathy. Future research will work toward complementary self-report and interview-based assessments of all three constructs described in this model. A comprehensive triarchic assessment model of psychopathy may be useful in making differential predictions regarding personality, adaptive community functioning, and antisocial behavior. For instance, an individual who is high in boldness and disinhibition might closely resemble Cleckley's classic portrayal of the psychopath as a convincingly charismatic but feckless rogue who "carries disaster lightly in both hands" and runs afoul of family, friends, and other community members, if not always the authorities. On the other hand, an individual who is high in meanness and disinhibition might more closely resemble the aggressive, exploitative, remorseless, and explosive phenotype captured by the PCL-R, and be at much higher risk for violence and other negative outcomes. A single elevation in disinhibition, on the other hand, might describe a chronically antisocial individual whose behavior is impulsive and irresponsible, and at times characterized by angry, reactive aggression (particularly while intoxicated), but who is lacking in malice and tends to experience a great deal of distress over his behavior and its consequences. In contrast, an individual who is characterized by elevated meanness in the absence of disinhibition might in some respects resemble the DSM-IV conceptualization of narcissistic personality, particularly features such as a sense of entitlement, an arrogant sense of superiority, interpersonal exploitativeness, and lack of empathy. Finally, as noted above, an individual with a

lone elevation in phenotypic boldness might be characterized as the classic successful psychopath, and could potentially function at relatively high levels in society, ascending to prominent positions in legal, political, business, law enforcement, medical, or academic professions.

Limitations & Future Directions

Some limitations of the present study should be noted before concluding. First, the typical pattern of startle potentiation for aversive pictures was not observed in this sample as a whole. Although mean startle amplitude for aversive pictures was significantly potentiated relative to pleasant, there were no significant differences between startle amplitude for neutral pictures and aversive pictures overall or any aversive content categories. Since aversive startle potentiation relative to neutral is so commonly replicated, this potentially limits the generalizability of the findings, and could have conceivably strengthened individual difference effects artificially (i.e., weak potentiation effects may be more susceptible to modulation by individual differences). Possible reasons for this irregularity are likely idiosyncratic and involve peculiarities regarding the current sample or the stimulus set, although it should be noted that the picture set used in this study is identical to that used in Vaidyanathan et al. (2009), which produced a more typical pattern of aversive startle potentiation. It should also be noted that, among low-BI scorers, a normal pattern of startle potentiation for aversive pictures was obtained.

Another limitation of the present study is that replication of prior research on psychopathy and startle potentiation was relatively weak. Although the psychopathy group by valence interaction was significant, direct comparisons of the two groups for

aversive-neutral difference scores were not significant. Thus, the regression analysis demonstrating partial mediation of PCL-R psychopathy by BI scores in the prediction of aversive startle potentiation may be difficult to replicate. Finally, this validation effort utilized an offender sample, as one of the primary aims was to evaluate relationships between the BI and PCL-R. As such, the present results may not generalize to community samples; thus, further validation of the BI measure in non-forensic settings is recommended. Specifically, future research should continue the work of validating and refining the BI measure in community and undergraduate samples, as well as elucidating the neurobiological substrate of boldness via psychophysiological and neuroimaging research. Furthermore, Patrick and colleagues (in press) strongly emphasized the importance of developmental processes that contribute to the expression of dispositional fearlessness as phenotypic boldness vs. meanness. Future research should continue to explore links between constructs described in the triarchic model of psychopathy and the developmental literature.

In closing, the present study has yielded promising initial findings regarding the construct validity of the Boldness Interview, and established an empirical link between this facet of the triarchic model of psychopathy and the PCL-R conceptualization of the disorder. These results also provide empirical support to the hypothesis that phenotypic boldness is associated with dispositional fearlessness, likely rooted in diminished amygdala reactivity. Continuing research on the correlates and neurobiological underpinnings of boldness and the other components of the triarchic model should contribute significantly to our understanding of psychopathy, as well as the basic dimensions of personality and psychopathology with which it is related.

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Footnote

[1] IAPS identification numbers for the images used in the present study were: Erotic – 4180, 4210, 4232, 4250, 4607, 4652, 4659, 4664, 4670, 2530*; Adventure – 5470, 5621, 8030, 8080, 8170, 8180, 8185, 8370, 8400, 8050*; Nurturant – 1440, 1463, 1721, 1722, 2071, 2150, 2160, 2311, 2340, 1750*; Victim – 3180, 3350, 3500, 3530, 3550, 6313, 6350, 6530, 9040, 3280*; Mutilation – 3010, 3053, 3060, 3069, 3071, 3080, 3102, 3400, 3064*; Threat – 1525, 6210, 6241, 6242, 6250, 6300, 6510, 3830, 6370, 1220*; Neutral – 2210, 2214, 2372, 2393, 2495, 2499, 2870, 2890, 5731, 7000, 7002, 7009, 7010, 7020, 7034, 7038, , 7041, 7050*, 7090, 7100, 7130, 7180, 7233, 7490, 7491, 7500, 7510*, 7595, 9070. Numbers marked by an asterisk indicate non-probed trials.

Appendix A: Boldness Interview Protocol

Courage

1. Have you ever been in any dangerous or life-threatening situations? [If yes:] Give me an example of such a situation. How did you react? How do you usually react in situations of this kind? Are you able to remain calm, or do you have a more intense emotional reaction?
2. Do you get frightened easily? What kinds of things frighten you or make you scared? Do you have any phobias—like fear of heights, closed spaces, animals, or the dark? [If yes:] How long have you had those fears? How often do those things frighten you?
3. Some people say that they can control their fear or shut it off at will – is this something that you are able to do? [If yes:] Give me an example of a time when you did that. How did you accomplish this?
4. When you're in a crisis or emergency, how do you handle it? Are you typically able to stay calm, or do you tend to get really worked up? Can you give me an example or two?
5. When you get scared, do you get over it quickly, or does it usually take you a long time to calm down? How long (in minutes) does it take you to recover? Give me an example.

Social Assurance

1. Are you easily embarrassed, or are you someone who does not embarrass easily? In what kinds of situations do you tend to feel embarrassed or awkward? Describe how you feel when that happens.

2. When you're with a group of new people, how do you usually act? Do you introduce yourself and make conversation, or do you tend to stay in the background and wait for others to talk to you?
3. Do you worry a lot about what others might think of you when you speak out in a group? Are you ever afraid that you'll make a fool out of yourself with others? [If yes:] Does that ever stop you from having conversations or speaking up in a group?
4. How would you describe your level of confidence as a speaker? Have you ever spoken, presented, or performed in front of a group? [If yes:] Describe the last time you did this. How well did you do and how did you feel about your performance?
5. Are you comfortable being the center of attention in a group? Do you seek the spotlight, or do you strive to avoid being noticed? Why do you think you feel that way?

Self-Confidence

1. How do you see yourself? How do others see you? What are some of your most important personality characteristics? How would you rate your self-esteem on a scale of 1-10, with 10 being the highest?
2. What is your level of confidence in yourself? How confident do you feel when you're up against a really tough challenge? What kinds of obstacles stand between you and your goals right now, and how do you plan to deal with those obstacles?

3. Do you get down on yourself a lot? What kind of things don't you like about yourself? Do you spend a lot of time thinking about your negative qualities?
4. What sorts of positive qualities do you have? Would you say the things you like about yourself outweigh the things you don't, or would you say the reverse? By how much—by a lot, or by just a little?
5. Do you find that you are pretty good at most things you try, or not so good? What sorts of things would you say you are really good at? What kinds of things are you not very good at? In general, how capable do you feel you are as a person?

Glibness

1. Do you like telling stories (either from your life, or stories you make up) to other people? Are people usually entertained by your stories, or do you feel the stories you have to tell would mostly bore people?
2. Are you an engaging speaker? Are you usually able to keep a person's attention when you're talking to him or her? [If yes:] How do you manage to do this? Is this a skill that you had to work on or does it come naturally to you?
3. Are you the kind of person who can start up a conversation with just about anyone? Are you good at keeping a conversation going? Does this come easily to you, or do you find it to be hard work?
4. Do you consider yourself a witty conversationalist – someone who is always ready with a clever remark? Do you enjoy telling jokes and making people laugh?

5. How do you think you would do as a radio or talk show host? Why do you think so?

Dominance

1. Do you consider yourself an effective leader? Why (or why not)? What qualities do you have that make you an effective leader (or not)?
2. When you're planning an outing or get-together with friends or family, do you like to take charge of making plans, or do you prefer to let someone else take charge? Why?
3. Can you picture yourself in a position of power, like in politics or business? How do you think you would perform if you were in charge of something like this? Do you ever daydream or have ambitions about being a powerful person?
4. Have you ever actually found yourself in a position of authority over others, like as a supervisor, manager, or team leader? [If yes:] How did you handle that situation? Did it feel natural for you, or uncomfortable? [If no:] Can you picture yourself in that sort of situation? How would you react?
5. How strong-willed are you when it comes to communicating your ideas about how things should be done? Do people you work with usually end up doing things your way, or do you more often do things as others want--or do you tend to find a middle way?

Persuasiveness

1. How persuasive are you with others? Can you typically get people to see things your way, or do you find it difficult to do this? [If the former:] Give me an example of the sorts of things you would do to influence someone.

2. Have you ever worked in sales before? Are you good at this (or do you think you would be)? [If yes:] Describe how you might make a sale to someone.
3. Do you find it easy to convince other people to do things for you, or is this something you find difficult to do, or that you shy away from? [If the former:] Give me an example. [If the latter:] Please tell me more about this.
4. Do you tend to bargain with people when buying a car, house, or something else of value? How effective are you as a negotiator? What sorts of negotiating strategies do you use? Can you give me an example?
5. Do you tend to conceal your motives from people when seeking to influence them, or are you usually up front about what you want? Do you ever tell people what they want to hear as a way to influence them or gain their trust? [If yes:] Is this something you do often, or only every now and then? Does this (i.e., telling people what they want to hear) come naturally to you, or is it something you find you have to work at?

Intrepidness

1. Do you like to drive (or ride in) cars really fast, or does it bother you to be in a car that is speeding? What is the fastest you have ever driven a car (in mph)? Did you enjoy the experience, or did it make you nervous to drive that fast?
2. Are you a thrill-seeker, or do you tend to shy away from activities that are exciting but involve risk? What sorts of thrill sports (such as skydiving, hang gliding, mountain or rock climbing, ski racing, whitewater rafting/canoeing, or cliff diving) have you engaged in? Aside from those you have tried (if any), are there other activities of this kind you would try if you had the chance?

3. Do you sometimes experience a rush from physical danger, or do you experience only fear? [If the former:] How would you describe the rush you experience? Is this a feeling you seek out?
4. Have you ever been in an emergency situation, such as a motor vehicle accident, fire, flood, or severe storm? [If yes]: Did you enjoy the feeling of danger at all? How did you act?
5. Do you think you would make a good fighter pilot or firefighter? What about other jobs that involve an element of danger (e.g., combat soldier, SWAT or undercover officer, bomb disposal expert, rescue worker)—how well would you function in a position like this? Have you ever had a job of this kind? [If yes:] Please explain. How effective were you at it, and how comfortable did you feel doing it?

Resiliency

1. In general, do you cope with problems in life by trying to work around them, or do you usually tackle them head on? Can you give me an example?
2. Have you ever had to overcome a really major challenge or obstacle in your life? [If yes:] Can you give me an example or two? How well did you handle this (these) situation(s)?
3. Compared to other people you know, how effectively do you cope with setbacks in your life? How long does it usually take you to recover? Is it longer or shorter than most people?
4. Have you ever felt really discouraged by difficult or challenging events in your life? What happened? How did you feel? How long did this feeling last?

5. Are there any negative events from your past that still bother you? [If yes:] What happened? How often do you think about this (these) event(s)?

Optimism

1. In general, do you feel lucky or unlucky as a person? Compared with others you know, do things tend to go your way more often, or less often?
2. Are you generally hopeful about your future? Why or why not?
3. What do you see yourself doing in 10 years from now? How successful do you think you can be? How happy?
4. Do you tend to worry about things that could happen to you or your loved ones? What sorts of things do you worry about? How often do you worry about things like this—regularly, or only every now and then?
5. Do you ever feel like the odds are stacked against you in life? [If yes:] Please explain.

Tolerance for Uncertainty

1. Do you prefer your life to be structured and predictable, or do you like having frequent changes to "shake things up"? What are some reasons that you prefer it this way?
2. Do you like to try new foods, drinks, or activities that are out of the ordinary? [If yes:] What are some examples of novel or unusual things you have tried?
3. How do you feel when you have to do something you've never done before—like perform a new task that requires some skill? Does it bother you to do this, or is this something you feel comfortable doing? Can you tell me about an experience you have had like this?

4. How do you usually feel going into an unpredictable situation? Do you tend to feel nervous when you don't know what to expect, or do you enjoy the experience of not knowing what is going to happen next? Can you give me an example?
5. How would you feel about moving to a foreign country where you didn't know the language or culture? Would you find this sort of experience exciting, or stressful? What are some reasons you would feel this way?

Appendix B: Boldness Interview Scoring Manual

General Scoring Instructions

The Boldness Interview consists of 10 subscales, each of which is comprised of several facet-level items. To score the interview, raters score each item on a scale of one to five. A score of one indicates that the item does not accurately describe the individual at all, whereas a score of five indicates that the item describes the individual with a very high degree of accuracy. A score of three indicates that the individual displays some characteristics that are consistent with the item description, but an equal number of characteristics that are inconsistent, as well.

Item scores are then summed within subscale, and divided by the total number of items in that subscale (and rounded to the first decimal). This calculation yields an average item score. Ex: An individual receives scores of five, four, and five on the items of the Self-Confidence subscale. These item scores are summed (5 + 4 + 5 = 14) and then divided by the number of items on the subscale (three) to yield a summary score for the Self-Confidence subscale (14 / 3 = 4.7). Average item scores are then summed across subscales to yield a total score for the interview, which can range from a low of 10 to a maximum score of 50. Ex: An individual receives subscale scores of 3.5, 4, 3, 4.7, 5, 2.8, 3, 4.2, 3.3, and 2. These are then summed to compute the Boldness total score (3.5 + 4 + 3 + 4.7 + 5 + 2.8 + 3 + 4.2 + 3.3 + 2 = 35.5).

What follows are descriptions of the 10 subscales of the Boldness Interview, and the items that comprise each subscale. These descriptions are to be used as scoring guides when rating interviews. Each item description is accompanied by an interview question number in brackets (e.g. [1.2]), which indicates the item(s) intended to provide

information relevant to the scoring of that item. However, be aware that interview participants may provide relevant information in other portions of the interview.

Courage

Individuals scoring high on the Courage scale are "afraid of far fewer things than most people." They are "not as affected by fear" as others and can "shut off" their fear at will if necessary. These individuals "stay cool, even in emergencies" and recover quickly from frightening experiences. Low scorers could be described as cautious people who "avoid danger at all costs." They are more fearful than most people, panic easily under pressure, and have trouble recovering their composure after being frightened.

1. Cool under pressure. This item describes an individual who does not panic easily, and is able to keep his/her cool in emergency situations. A high scorer might describe him/herself as the type of person that others look to in a crisis. Low scorers are easily rattled, and panic readily under pressure. They may report that they can't handle the stress of a crisis. [1.1, 1.4]
2. Not easily frightened. Individuals who score high on this item have higher than normal thresholds for experiencing fear. Many experiences that others find frightening would fail to perturb a high scorer. High scorers may report never having an experience that seemed truly frightening to them. Low scorers, on the other hand, frighten easily and are quick to retreat from possible danger. They may describe themselves as feeling more jumpy or skittish than most people. [1.2]

3. Exerts control over fear. This item describes an individual who has the ability to control his/her feelings of fear, seemingly at will. High scorers generally view fear as an emotion that they can shut off when necessary in order to function or cope effectively. Low scorers find it difficult to control their feelings of fear and are easily overwhelmed by fear. [1.3]
4. Has few fears. A high score on this item indicates that the individual in question reports having fewer fears than most people. Activities or situations that others describe as scary or even terrifying are not feared or avoided by high scorers. High scorers are unlikely, for instance, to possess fears of flying, commonly feared animals (like snakes, dogs, or spiders), fire, or enclosed areas. Low scorers may describe having a variety of fears, some of which may be of phobic severity. [1.2]
5. Recovers quickly from fear. High scorers on this item are quick to return to normal after feeling frightened. Once the source of their fear has been removed, they recover quickly and easily. Low scorers, on the other hand, have a difficult time recovering after becoming frightened, and may remain in an aroused or fearful state long after danger has passed. [1.5]

Social Assurance

Individuals scoring high on Social Assurance are poised and “hard to embarrass.” They “feel confident when meeting new people” and feel very self-assured when talking to a group. They also prefer to take the initiative in conversations and “like to get the party started.” They are comfortable being the center of attention, and are generally not worried about appearing foolish in front of others. Low scorers find

social interaction anxiety-provoking, perhaps painfully so. They tend to be pre-occupied with ways in which they might embarrass themselves, and lack confidence when addressing even small groups. They avoid conversation, especially with new people, and "prefer not to stand out in a crowd." Extremely low scorers may suffer from social phobia.

1. Not easily embarrassed. Individuals who score high on this item are generally unconcerned about what might go wrong in social interactions and are difficult to embarrass. When social mishaps or embarrassing situations occur, high scorers are able to cope with such situations and get over them quickly Low scorers fret over even minor embarrassments and may be paralyzed by awkward social situations. They may avoid certain situations for fear of doing something embarrassing. [2.1]
2. Takes initiative in social interactions. This item describes a tendency to be the initiator of social interaction, rather than passively waiting for others to do so. High scorers feel comfortable starting conversations with strangers. Low scorers are not socially outgoing and prefer not to initiate conversations with others unless absolutely necessary. [2.2]
3. Lacks social anxiety. High scorers on this item generally enjoy interacting with others, find it easy to do so, and feel little or no anxiety in relation to social situations. Low scorers, on the other hand, may report feeling highly anxious prior to social interactions and may avoid some interactions for this reason. [2.3]

4. Confident as a speaker. This item deals with the ability to approach public speaking with confidence. High scorers are not bothered by, and may even enjoy, addressing people in groups. Low scorers, however, are terrified by public speaking, and avoid it at all costs. Even when fully prepared to make a speech, low scorers feel anxious and unsure of themselves when speaking publicly. [2.4]
5. Comfortable drawing attention to self. High scorers seek out and enjoy the spotlight. They are comfortable being the center of attention and are not afraid to stand out in a crowd. Low scorers avoid drawing attention to themselves and prefer to blend in rather than stand out. [2.5]

Self-Confidence

The Self-Confidence scale is intended to measure the degree to which an individual thinks highly of him/herself. High scorers on this scale possess a self-image that is “rock solid” and feel that they “stack up well against most others.” They may have a great deal of confidence in their abilities and feel that they can succeed at virtually anything they try. They are generally undaunted by challenges and feel confident that they can overcome most, if not all, difficulties. Low scorers tend to be wracked with self-doubt and self-criticism. They may feel that they do not compare favorably with other people, and have little faith in themselves.

1. High global self-esteem. High scorers on this item generally feel very good about themselves, both in absolute terms and in comparison to others. They might rate their self-esteem a 10/10 and feel that they have many good qualities. Low scorers tend to be down on themselves often, and have a negative self-

image. They may feel that they compare poorly with their peers in terms of their worth. [3.1, 3.3, 3.4]

2. Confidence in abilities. This item measures an individual's level of confidence in his/her abilities. High scorers feel that they have many useful skills, and that they are able to do most things well. Low scorers tend to have limited faith in their own abilities. They are feel incompetent in many areas and are frequently unsure of themselves. [3.2, 3.5]
3. Undaunted by challenges. High scorers on this item are generally confident in their ability to overcome obstacles. They feel prepared to deal with nearly any challenge. Low scorers question their ability to deal with challenges and feel easily defeated by difficulties. [3.2]

Glibness

Individuals scoring high on the Glibness scale are prolific conversationalists: they "have the gift of gab," "have a way with words," and "can talk about nearly anything with ease." They find pleasure in their ability to weave interesting stories and feel that they can "pull people in" by the engaging way that they talk. They feel comfortable conversing about nearly anything, and perceive that they are usually the driving force behind interesting dialogues. High scorers may also be known for having "a witty remark" always at the ready. Low scorers, on the other hand, feel that "people get bored" when they tell stories, and are "not very good at telling jokes." They could be described as quiet and reserved in social interactions, with little love for conversation with others.

1. Enjoys storytelling. This item describes an individual who truly enjoys narrating to others and telling stories. High scorers feel that they have many interesting stories to tell and they love to share them. This may be evidenced in interviews by the fact that the subject comes up with a story in response to many questions. Low scorers tend to be reserved in conversation and perceive themselves as not having interesting things to talk about, or inept at storytelling. In interviews, low scorers tend to provide straightforward answers to questions and are less likely to draw on personal experiences to illustrate their points. [4.1, 4.5]
2. Interpersonally engaging. This item describes an individual who has a way of capturing his/her listener's attention and truly engaging others in a dialogue or narrative. Conversations with high scorers are typically lively and animated, rarely than dull or uninteresting. Low scorers typically fail to grab the listener's attention in a conversation, and may be terse, repetitive, or show a lack of energy or interest when speaking. [4.1, 4.2]
3. Facile in conversation. This item describes an individual who demonstrates in interactions (or reports) that his or her conversation flows with ease. High scorers can discuss nearly any topic readily, and report that they can keep conversations going with minimal effort. Low scorers view conversation as difficult work, and may have trouble expressing themselves. [4.3, 4.5]
4. Witty. This item describes an individual who is quick-witted, and nearly always ready with a clever remark. High scorers have a clever way with words and find

it easy to make others laugh . Low scorers are more serious and restrained in conversation, and do not readily think of witty things to say. [4.4]

Dominance

The Dominance scale is designed to measure an individual's strength of will and drive to take charge of situations. High scorers "love to be in the driver's seat" and consider themselves "born leader(s)." They may "seek out positions of power" and attempt to "dominate others." These individuals are drawn to positions of power and like being in the role of authority. They prefer to take initiative in nearly everything that they do. Low scorers avoid authority roles and prefer to let others take charge of situations. They may feel awkward if placed in leadership roles.

1. Drawn to authority positions. This item describes an individual who seeks out positions of power and enjoys being in authority roles. High scorers may admit to fantasizing about being a powerful person in politics or business, or may actively seek such status. Low scorers have little or no interest in having authority over others and actively avoid being placed in such positions. [5.3, 5.4]
2. Confident in leadership skills. This item describes an individual who genuinely feels that he/she is a natural leader. High scorers feel that they have the personal qualities and skills needed to take charge and to lead others effectively. Low scorers feel ill-equipped to lead and have limited confidence in their ability to do so. [5.1, 5.3]
3. Takes initiative. This item describes an individual who likes to take charge of situations. High scorers prefer not to wait for someone else to take control of a situation or make decisions; they would rather take charge themselves. Low

scorers are more comfortable allowing others to make decisions rather than taking control themselves. [5.2]

4. Strong-willed. This item describes an individual who does not readily submit to others. High scorers are accustomed to having things done their own way, and resist changing their opinions, behaviors, or strategies for the sake of others; rather, others are expected to make the adjustments. Low scorers are more flexible, and are willing to make compromises or adjustments in deference to others. [5.5]

Persuasiveness

The Persuasiveness scale measures an individual's "knack for influencing people." High scorers on this scale are effective at getting other people to see things their way, and are skilled negotiators and bluffers. They frequently use their persuasive ability to get others to do things for them or to acquire things that they want/need. High scorers may also resort to indirect/dishonest tactics such as flattery or deception in order to achieve their objectives. Low scorers are more direct and straightforward, and do not feel particularly skilled in the art of persuasion. They may feel awkward or uncomfortable in negotiations, which may contribute to their ineffectiveness in such situations.

1. Influences opinions of others. This item describes an individual who is able to change the way that others behave or think about a particular subject. High scorers might be described as strong debaters, or having the potential to be effective lawyers or politicians. Low scorers have difficulty getting others to see things their way and may give up debates quickly. [6.1, 6.2]

2. Skilled negotiator. This item describes an individual who is able to bargain or negotiate effectively. High scorers are typically able to get what they want from a negotiation process, such as bargaining over the price of a car or some other item of value. Low scorers appear to lack the skills or interpersonal qualities necessary to bargain effectively, and may avoid negotiations or perform less well at them. [6.4]
3. Instrumental use of persuasion. This item describes an individual who uses his/her persuasive abilities to get what he/she wants from others. High scorers may describe being able to get others to do tasks for them or give them things that they want. Low scorers are not effective in persuading others to do things for them and generally prefer to use other approaches to getting what they want. [6.2, 6.3]
4. Uses subterfuge to influence others. This item describes an individual who is willing to use "sly" or indirect methods to influence other people. High scorers report that they sometimes conceal their true motives, flatter, or "tell people what they want to hear" in order to gain influence over others. Low scorers might be described as more straightforward and direct. [6.5]

Intrepidness

The Intrepidness scale is designed to measure the degree to which an individual is willing to "do physically dangerous things just for the rush." High scorers enjoy driving fast in cars and riding high-speed amusement park rides. They also report that they would enjoy other potentially dangerous activities that they may not have actually been exposed to, such as sky-diving, hang-gliding, or deep-sea diving. Importantly,

these activities are sought because the individual enjoys the physiological arousal ("rush") of danger, rather than as a strategy for defeating boredom. Thus, the thrill-seeking of the high Intrepid individual should not be confused with recklessness or boredom susceptibility, as these are meaningfully different constructs. Low scorers, on the other hand, attempt to avoid even marginally dangerous activities as much as possible. They are averse to taking risks, particularly for recreational purposes, and are likely to find the physiological arousal evoked by danger to be aversive.

1. Seeks physically dangerous activities. This item describes an individual who engages in or is attracted to physically dangerous activities because they are viewed as pleasurably exciting. High scorers may frequently engage in activities such as driving fast in cars or motorcycles (or racing), and may express a desire to try more intense (but less common) experiences such as sky diving, etc. They may also be attracted to occupations that involve physical danger, such as law enforcement, firefighter, pilot, military, etc. Low scorers are highly risk-averse and are not attracted to danger; rather, they seek to avoid dangerous activities if possible. [7.1, 7.2, 7.5]
2. Enjoys physical arousal of danger. This item describes an individual who enjoys the "rush" of danger. High scorers report that they like the feeling of physiological arousal associated with physical danger. They may report that during past experiences with real danger (e.g., car crashes, fires, natural disasters), their feelings of fear were accompanied by the pleasurable feeling of an "adrenaline rush" (or something similar). Low scorers, in contrast, find the

physiological arousal associated with danger to be more purely aversive. [7.3, 7.4]

Resiliency

The Resiliency scale measures tendencies to "recover from setbacks more quickly than other people" and to maintain morale in the face of hardship. High scorers describe themselves as "well-equipped to deal with stress" and "have always found ways to overcome life's challenges." They are quick to "get over things that would traumatize others" and "don't give up easily." They also prefer to "cope actively and effectively with problems" rather than avoiding them. Low scorers are "easily discouraged by the first sign of failure" and "don't get over major stresses easily." They "often run from problems" rather than facing them, and feel a general inability to cope with stress or misfortune. It is important to distinguish this construct from Courage, which involves relative immunity to fearful stimuli, whereas Resiliency entails hardiness against life stress of a more tonic nature, as well as overcoming practical obstacles blocking goals.

1. Overcomes challenges. This item describes an individual who seems more than capable of dealing with obstacles or stressors in life. High scorers show a general immunity to life stressors, and appear relatively unconcerned about past misfortunes. Low scorers, on the other hand, appear to be overwhelmed by even moderate problems and lack the ability to cope effectively with life stress. This item should be distinguished from the Undaunted by challenges item of the Self-Confidence scale, in that this Resiliency item indexes an empirically

demonstrated ability to overcome challenges, whereas the Self-Confidence item measures confidence in one's ability to deal with future problems. [8.2]

2. Recovers quickly from setbacks. This item describes an individual who is able to bounce back quickly from setbacks in life. High scorers report never "being down" for long, and they get over negative experiences quite quickly. Low scorers may tend to ruminate over past setbacks and take a long time to recover from significant stresses. [8.3]
3. Hard to discourage. This item describes an individual who is not prone to become demoralized in the face of stress or misfortune. High scorers are resistant to despair arising from failures or obstacles; instead, failure tends to inspire high scorers to redouble their efforts to overcome whatever it is they are facing. Low scorers are readily discouraged in the face of strife, and are likely to abandon a task or course of action if confronted with initial failures. [8.4, 8.5]
4. Deals actively with problems. This item describes an individual who prefers to confront challenges head-on rather than avoiding them. High scorers will attempt to deal with problems proactively as they arise. Low scorers will attempt to ignore or avoid dealing with problems as long as possible. [8.1, 8.2]

Optimism

The Optimism scale is designed to measure the degree to which an individual is hopeful about his/her future. High scorers feel that "things will turn out well" and "don't tend to worry about bad things happening." Such individuals feel "luckier than most" and "generally feel hopeful about the future." This attitude should not be confused with the facets of Resiliency, which measure a demonstrated resistance to

failure, whereas Optimism is intended to measure a lack of concern about potential failures and a belief that good rather than bad fortune awaits. Low scorers feel that they have been the victim of bad luck and just "can't seem to catch a break." They generally lack hope about the future and feel that misfortune is basically inevitable. Such individuals "often worry about the future" and find it "hard to see the light at the end of the tunnel."

1. Optimistic about future. This item describes an individual who typically feels positive about the future. High scorers are constantly looking forward to the future and believe that circumstances will generally tend to improve as time passes. Low scorers are lacking in hope, and tend to have a negative outlook on future events. [9.2, 9.3]
2. Feels lucky. This item describes an individual who feels that he/she is frequently blessed with good fortune. High scorers may report that they have had more than their share of good luck and that things generally tend to work out for them. Low scorers feel that they have been the recipient of bad luck, and that the odds are stacked against them in life. [8.1, 8.5]
3. Unconcerned about potential misfortune. This item describes an individual who does not spend much time thinking about things that might turn out poorly. High scorers do not tend to worry about the possibility of negative events happening. Low scorers tend to be preoccupied with and worry about potential disasters in the future. [8.4]

Tolerance for Uncertainty

This scale measures the degree to which an individual feels comfortable in unfamiliar roles or environments. High scorers "like the challenge of entering unfamiliar situations that others might find scary" and "do not usually feel much anxiety in novel situations that others find unsettling." They "function well in new situations, even if unprepared." They also seek novel experiences such as new foods, activities, places, and cultures or unfamiliar groups of people. Low scorers, on the other hand, tend to shy away from the unfamiliar and stick to comfortable behavioral routines. They dislike "going into an unfamiliar situation without knowing all the details," prefer predictable situations over the unexpected, and aren't interested in seeking out new experiences.

1. Not afraid of the unknown. This item describes an individual who feels little or no anxiety when faced with a situation they have never encountered before, like a new task to figure out. High scorers are comfortable entering situations about which they know little and that may involve risk. Low scorers tend to be filled with trepidation at the thought of the unknown. [10.3]
2. Prefers unpredictability. This item describes an individual who would rather not be aware of what is going to happen next. High scorers may report that they find predictability dull, and prefer the excitement of situations in which outcomes are unpredictable. Low scorers are drawn to routine and schedules and prefer to avoid environments that are unpredictable. [10.1, 10.4]

3. Seeks novel experiences. This item describes an individual who is attracted to new experiences. High scorers enjoy eating new foods, experiencing foreign cultures, meeting new people, and visiting new places. Low scorers find the unfamiliarity of such pursuits to be uncomfortable or anxiety-provoking, and tend to avoid novel experiences, preferring instead to stick to well-worn and familiar patterns. [10.2, 10.5]

Appendix C: Boldness Interview Scoring Form

Courage	Inaccurate			Accurate		
1. Cool under pressure	1	2	3	4	5	N/I
2. Not easily frightened	1	2	3	4	5	N/I
3. Exerts control over fear	1	2	3	4	5	N/I
4. Has few fears	1	2	3	4	5	N/I
5. Recovers quickly from fear	1	2	3	4	5	N/I
				Total:		
				Total/5:		

Social Assurance	Inaccurate			Accurate		
1. Not easily embarrassed	1	2	3	4	5	N/I
2. Takes initiative in social interactions	1	2	3	4	5	N/I
3. Lacks social anxiety	1	2	3	4	5	N/I
4. Confident as a speaker	1	2	3	4	5	N/I
5. Comfortable drawing attention to self	1	2	3	4	5	N/I
				Total:		
				Total/5:		

Self-Confidence	Inaccurate			Accurate		
1. High global self-esteem	1	2	3	4	5	N/I
2. Confidence in abilities	1	2	3	4	5	N/I
3. Undaunted by challenges	1	2	3	4	5	N/I
				Total:		
				Total/3:		

Glibness	Inaccurate			Accurate		
1. Enjoys storytelling	1	2	3	4	5	N/I
2. Interpersonally engaging	1	2	3	4	5	N/I
3. Facile in conversation	1	2	3	4	5	N/I
4. Witty	1	2	3	4	5	N/I
				Total:		
				Total/4:		

Dominance	Inaccurate			Accurate		
1. Drawn to authority positions	1	2	3	4	5	N/I
2. Confident in leadership skills	1	2	3	4	5	N/I
3. Takes initiative	1	2	3	4	5	N/I
4. Strong-willed	1	2	3	4	5	N/I
				Total:		
				Total/4:		

Persuasiveness	Inaccurate			Accurate		
1. Influences opinions of others	1	2	3	4	5	N/I
2. Skilled negotiator	1	2	3	4	5	N/I
3. Instrumental use of persuasion	1	2	3	4	5	N/I
4. Uses subterfuge to influence others	1	2	3	4	5	N/I

Total: _____

Total/4: _____

Intrepidness	Inaccurate			Accurate		
1. Seeks physically dangerous activities	1	2	3	4	5	N/I
2. Enjoys physical arousal of danger	1	2	3	4	5	N/I

Total: _____

Total/2: _____

Resiliency	Inaccurate			Accurate		
1. Overcomes challenges	1	2	3	4	5	N/I
2. Recovers quickly from setbacks	1	2	3	4	5	N/I
3. Hard to discourage	1	2	3	4	5	N/I
4. Deals effectively with problems	1	2	3	4	5	N/I

Total: _____

Total/4: _____

Optimism	Inaccurate				Accurate	
1. Optimistic about future	1	2	3	4	5	N/I
2. Feels lucky	1	2	3	4	5	N/I
3. Unconcerned about potential misfortune	1	2	3	4	5	N/I

Total: _____

Total/3: _____

Tolerance for Uncertainty	Inaccurate				Accurate	
1. Not afraid of the unknown	1	2	3	4	5	N/I
2. Prefers unpredictability	1	2	3	4	5	N/I
3. Seeks novel experiences	1	2	3	4	5	N/I

Total: _____

Total/3: _____

BI Total Score: _____