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Identifying Personality Subtypes Based on the Five-Factor Model Dimensions in Male Prisoners: Implications for Psychopathy and Criminal Offending

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Abstract

The current study was designed to identify personality subtypes on the basis of the five-factor model dimensions in male prisoners. Participants included 110 Flemish male prisoners assessed by means of the Neuroticism, Extraversion, Openness Five Factor Inventory and different symptom, personality, and coping measures. We found two clusters: an emotionally stable/resilient cluster and an aggressive/undercontrolled cluster. Prisoners within the aggressive/undercontrolled cluster scored significantly higher on almost all Minnesota Multiphasic Personality Inventory–2 basic scales, (in) direct aggression measures, and depressive coping scales compared with resilients. They also scored higher on drug abuse and committed more sexual offenses than resilient prisoners. These two personality subtypes bear theoretically and practically important implications for psychopathy subtypes and different pathways to criminal offenses.

Keywords

personality, subtypes, coping, type of offenses, prisoners

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Introduction

There is overwhelming evidence that criminal offenders differ in important ways, but there is disagreement about how best to classify and understand these differences. Several authors (e.g., Herzberg & Hoyer, 2009; Herzberg & Roth, 2006; Hicks, Markon, Patrick, Krueger, & Newman, 2004) have introduced the idea of personality heterogeneity of criminal offenders and the use of classification methods for differentiating them into etiologically separable subgroups, especially those corresponding to different subgroups of psychopathy. For sometime, researchers have made efforts to understand and differentiate criminals into etiologically separate subtypes. For example, in the literature on sex offenders, specific typologies exist for child molesters and rapists (see Eher, Neuwirth, Fruehwald, & Frottier, 2003; Knight & Prentky, 1990; Woessner, 2010, for a detailed description of these typologies). Other researchers have long distinguished "undercontrolled" from "overcontrolled" criminals, with the former group (ostensibly linked to certain psychopathy subtypes) marked by insufficient impulse control and the latter group marked by excessive impulse control (see Megargee & Bohn, 1979; Megargee, Cook, & Mendelsohn, 1967; Verona & Carbonell, 2000). In addition, some researchers using cluster analysis (Tweed & Dutton, 1998; Waltz, Babcock, Jacobson, & Gottman, 2000) have similarly reported evidence for at least two subgroups among male spouse batterers, one subgroup that engages in instrumental or manipulative violence characterized by marked antisocial features and another that engages in impulsive violence characterized largely by dysphoric features.

Indeed, cluster analysis has been a helpful statistical tool for disaggregating the broad phenotype of criminality into potentially more etiologically homogeneous subgroups, including those related to psychopathy (e.g., see Blackburn, 1975, 1996). Hicks et al. (2004) used cluster analysis to identify subtypes of criminal psychopaths on the basis of the Multidimensional Personality Questionnaire–Brief Form in 96 male prisoners. Their model-based cluster analysis yielded two groups: emotionally stable and aggressive psychopaths. Emotionally stable psychopaths were characterized as immune to negative events, socially dominant, lacking in close attachments, and capable of strategic action but prone to take risks (Hicks et al., 2004), resembling "primary" psychopaths. Primary psychopaths, who are similar to individuals described by Cleckley (1941/1988) in his classic monograph on psychopathy, are superficially charming, self-centered, guiltless, incapable of deep attachments to others, and largely devoid of anxiety (see also Karpman 1941; Lykken, 1995; Skeem, Poythress, Edens, Lilienfeld, & Cale, 2003). Aggressive psychopaths were characterized by tendencies to be upset by minor stressors, respond with aggressive actions, view the world as populated by enemies, be uncontrolled, and devoid of close relationships (Hicks et al., 2004), resembling "secondary psychopaths" (Karpman, 1941; Lykken, 1995; Skeem et al., 2003). Secondary psychopaths, like primary psychopaths, are also at elevated risk for antisocial and criminal behavior but are presumably capable of guilt and loyalty to others; their maladaptive actions are ostensibly driven largely by poor impulse control and hostility. Comparison of the two types of psychopaths showed that

aggressive psychopaths—compared with emotionally stable psychopaths—engaged in more fights, exhibited an earlier age of onset of criminal behavior, had a lower IQ, and reported more alcohol-related problems (Hicks et al., 2004).

In a sample of 691 offenders who met *Diagnostic and Statistical Manual of Mental Disorders* (4th ed.; American Psychiatric Association, 1994) criteria for antisocial personality disorder, a disorder marked by a longstanding history of antisocial and criminal behavior, Poythress et al. (2010) found evidence for similar subtypes using factors derived from the Psychopathy Checklist–Revised (PCL-R; Hare, 1991/2003). Moreover, as predicted, primary psychopaths performed more poorly on a task of passive avoidance learning—arguably the canonical deficit of classic psychopathy (Lykken, 1995)—whereas secondary psychopaths engaged in higher levels of aggressive misconduct and violent recidivism, although the lattermost finding was only marginally significant.

These findings are consistent with older suggestions (e.g., Karpman, 1941) that superficially similar criminals may be classified into two broad subtypes, one marked by low anxiety, guiltlessness, superficially healthy functioning, interpersonal dominance, and adequate planning (primary psychopaths; see also Cleckley,1941/1988, for a similar description) and the other marked by heightened anxiety, guilt, and poor impulse control (secondary psychopaths).

In a sample of 256 detained offenders (241 males, 15 females), Herzberg and Roth (2006) performed a cluster analysis on the Neuroticism, Extraversion, Openness Five Factor Inventory (NEO-FFI), a well-validated measure of the five factor model (FFM) of personality, which consists of five dimensions: Neuroticism (N), Extraversion (E), Openness (O), Agreeableness (A), and Conscientiousness (C). Their data revealed five personality subtypes: the *resilient subtype* (low N; high E, A, C; and moderately high O), the *confident subtype* (medium high N, A, C and moderately high E, O), the *reserved subtype* (low N, E, O and moderately high A, C), the *overcontrolled subtype* (high N, low E, and medium to low O, A, C), and finally the *undercontrolled subtype* (high N; moderate E, O; and low A, C). Resilient prisoners appeared better adjusted than the other subtypes, had a higher educational degree, rarely reported lysergic acid diethylamide (LSD) consumption, and described their family environment as offering a positive-emotional climate. Undercontrolled prisoners, in contrast, reported more frequent ecstasy consumption and juvenile delinquency than the other prisoners.

Herzberg and Hoyer (2009) replicated these five subtypes in a sample of 91 male prisoners based on the NEO-FFI and found associations between these subtypes and clinical and behavioral characteristics. The resilient prisoners reported lower antisocial behavior, fewer borderline symptoms, and less difficult interpersonal behavior than the over- and the undercontrolled prisoners. The confident and the reserved prisoners occupied an intermediate position on the continuum of psychological adjustment (Herzberg & Hoyer, 2009).Comparing the results of Hicks et al. (2004), Herzberg and Hoyer, and Herzberg and Roth (2006), the emotionally stable psychopaths and resilient prisoners show a similar personality profile, as do aggressive psychopaths and undercontrolled prisoners. Resilient/emotionally stable prisoners exhibited the

best psychosocial adjustment, raising the possibility that the resilient FFM-based sub-type could be influenced by a social desirability response style. Roth and Herzberg (2007) investigated this hypothesis via a web-based study and showed that resilient individuals received higher scores on measures of social desirability. Although this finding might reflect greater conscious impression management on the part of resilient individuals, it is at least equally plausible that participants' elevated scores on measures of social desirability reflect genuine psychological variance. Indeed, it is well established that although self-reported social desirability measures can be affected by lying, such measures are substantially saturated with actual personality variance reflecting such traits as low neuroticism and high agreeableness (Piedmont, McCrae, Riemann, & Angleitner, 2000; Uziel, 2010).

Although the previous cluster-analytic studies are valuable, they leave several important questions unanswered. For example, both studies by Herzberg and colleagues used clustering methods that do not permit formal statistical tests of fit (in contrast to model-based cluster analysis, used in this investigation), so it is possible that they extracted more clusters than was warranted by their data. Under the assumption that the data represent an unknown number of different subpopulations, we used a statistical fit index with Mclust to attempt to fit multiple mixture Gaussian models and to evaluate the goodness of fit of multiple solutions within each model and across models (see also Poythress et al., 2010). In contrast to traditional methods of cluster analysis, a relatively new technique called model-based cluster analysis (a) permits formal statistical tests of different clustering solutions and (b) will not automatically yield more than one cluster if the data do not warrant it. Furthermore, it is not clear how subtypes of prisoners differ in their aggression or types of aggressive offenses; such information may be important for the theoretical understanding of these subtypes and risk prediction. It is also not clear whether these subtypes can be recaptured from well-validated measures of psychopathology.

Finally, there is a paucity of research on how various criminal subtypes differ in their coping styles, which may bear important implications for treatment approaches. For example, criminals with more avoidant coping styles might benefit from interventions that diminish their anxiety levels by teaching them more effective stress management capacities. A few researchers have found evidence for differential coping styles among subtypes of offenders (Feelgood, Cortoni, & Thompson, 2005; Marshall, Cripps, Anderson, & Cortoni, 1999). For example, Feelgood et al. (2005) found that sex offenders used higher levels of ineffective coping styles, such as emotion-oriented coping, than violent offenders and individuals in community samples. In the psychopathy literature, some researchers have investigated differences in shame coping styles between primary and secondary psychopaths within the Blackburn (1975, 1996) model, which distinguishes primary from secondary psychopaths (Campbell & Elison, 2005; Morrison & Gilbert, 2001). Specifically, Campbell and Elison (2005) found that secondary psychopathy, as measured by the Self-Report Psychopathy Scale (SRPS; Levenson, Kiehl, & Fitzpatrick, 1995), was positively associated with an internalizing shame coping style, whereas primary psychopathy was negatively associated with this style. These

findings are broadly consistent with the theoretical conjectures of Karpman (1941), who argued that primary psychopaths suffer from a core constitutional emotional deficiency, whereas secondary psychopaths are regarded as prone to negative emotions, such as guilt and embarrassment (Skeem et al., 2003, in Campbell & Elison, 2005).

The current study used model-based cluster analysis, which as noted earlier, incorporates rigorous statistical criteria for model fit, to identify personality subtypes on the basis of the FFM dimensions in Flemish male prisoners. In addition, we examined the validity of these subtypes by comparing their scores on measures of psychopathology, including (a) psychopathy; (b) a well-established omnibus measure of psychological symptoms, namely, the Minnesota Multiphasic Personality Inventory–2 (MMPI-2); (c) aggression and aggressive offenses; (d) coping styles; and (e) substance abuse, which tends to be associated with indices of secondary, but not primary, psychopathy (Smith & Newman, 1990). This study contributes to ongoing research aimed at resolving the heterogeneity of individuals within broad criminal samples.

Based on previous research, we hypothesized the existence of two subtypes resembling the emotionally stable/resilient and aggressive/undercontrolled subtypes of Hicks et al. (2004) , Herzberg and Hoyer (2009), and Herzberg and Roth (2006; see also Poythress et al., 2010). In addition, we investigated the criterion-related validity of the subtypes we found by comparing them on theoretically relevant external criterion measures, such as intelligence, psychopathy, general personality traits (including validity scales), (in)direct aggression, coping styles, and types of offenses. We predicted that the first subtype (the resilient/reserved/confident prisoners) would score higher on intelligence and psychopathy Factor I of the PCL-R, which detects the core interpersonal and affective features of psychopathy, and personality scales relevant to social desirability (reflecting greater self-confidence and superior adjustment). In addition, we predicted that the second subtype (undercontrolled prisoners) would score higher on Factor II of the PCL-R, which detects a chronic impulsive and antisocial lifestyle, personality scales relevant to psychological distress, measures of aggression and aggressive offenses, and substance misuse. Our analyses for coping styles were in part exploratory, although we anticipated that the second subtype would score higher on most measures of coping given that coping in general is associated with heightened levels of psychological distress (Coyne & Racioppo, 2000). Moreover, resilient prisoners (who are ostensibly similar to primary psychopaths) are a separable group largely devoid of emotional and affective responses, whereas undercontrolled prisoners (who are ostensibly similar to secondary psychopaths) are capable of experiencing intense psychological distress (Campbell & Elison, 2005).

Method

Participants and Procedure

Participants were 110 male offenders from a high security prison in Belgium, aged between 19 and 70 years (*M* = 37.14, *SD* = 11.55). A total of 96 (87.27%) of the

110 prisoners were Belgian, 11 (10%) Moroccan, 1 (0.91%) Italian, 1 (0.91%) Kosovo Albanian, and 1 (0.91%) Turkish, but they all spoke and read Flemish. The present sample can be considered representative of all high-security prisons for males in Belgium. All participants were found guilty and criminally responsible of their crimes and were convicted for at least 5 years. All participants, who were able to read and understand the measures, filled out the questionnaires (see below) as part of their routine clinical assessment during their stay in prison. The PCL-R scores of each participant were based on a standardized interview and a detailed review of the criminal records by clinical psychologists at the prison, who were trained formally in the administration and scoring of the PCL-R. The prison governing board and university's ethical committee granted us permission to use all prisoners' personality and psychopathology data anonymously.

Assessment

The personality variables on which the cluster analysis was performed were the FFM traits of the NEO-FFI (Costa & McCrae, 1992; Dutch version: Hoekstra, Ormel, & de Fruyt, 1996). The NEO-FFI is a 60-item self-report instrument that assesses the traits of Neuroticism (N), Extraversion (E), Openness (O), Agreeableness (A), and Conscientiousness (C). Items are answered on a 5-point Likert-type scale, ranging from *strongly agree* to *strongly disagree*. The reliability and construct validity of the Dutch NEO-FFI are satisfactory. For example, the internal consistencies (Cronbach's α) of the five scales range from .64 to .88 and the test–retest reliabilities (after 2 and 6 months) range from $r = .75$ to $r = .87$. In addition, the Dutch NEO-FFI demonstrates adequate convergent and discriminant validity with other measures of normal-range personality. Finally, the Dutch NEO-FFI has norms for different age and gender groups (Hoekstra et al., 1996).

To examine the criterion validity of the personality subtypes, we used several external criterion measures, which are described below.

The Raven Standard Progressive Matrices (Raven, Raven, & Court, 2003) is a multiple choice intelligence test of fluid intelligence. The booklet comprises five sets (A to E) of 12 items each, with items within a set involving increasing cognitive complexity. All items are presented in black ink on a white background. Because some authors have reported that primary psychopathy traits are either uncorrelated or positively associated with IQ but that secondary psychopathy traits are negatively associated with IQ (e.g., Benning, Patrick, Hicks, Blonigen, & Krueger, 2003), this measure is of theoretical relevance to our investigation.

The MMPI-2 (Butcher, Dahlstrom, Graham, Tellegen, & Kaemmer, 1989; Dutch version: Derksen, De Mey, Sloore, & Hellenbosch, 1997), which is the most widely used measure of psychopathology in the world, consists of 567 true–false items. The person's responses to these items are scored on 10 basic scales that assess major dimensions of psychopathology. In addition, 3 major validity scales assess test-taking attitudes (see Table 1). Although these scales were derived largely using an a-theoretical, empirical approach to test construction (see Helmes & Reddon, 1993), they have

Table 1. Means (*SD*s) of Age, MMPI-2, BDHI, and UCL Scale Scores for the Two Personality Subtypes.

	Cluster 1	Cluster 2		
	Undercontrolled (*n* = 62[a])	Resilient-like (*n* = 48)		
	M (SD)	*M (SD)*	*F*	[b]Partial η^2
Age	37.05 (11.56)	37.25 (11.64)	0.008	0.00
RSPM	46.73 (6.79)	50.17 (4.35)	5.86**	0.08
PCL-R				
PCL-R total	24.24 (8.26)	25.16 (7.22)	0.26	0.00
PCL-R F1	10.45 (2.98)	11.30 (3.95)	1.21	0.01
ADI	0.46 (0.25)	0.57 (0.31)	2.98	0.04
DAE	0.84 (0.18)	0.84 (0.22)	0.00	0.00
PCL-R F2	10.49 (5.13)	10.69 (4.45)	0.00	0.00
ILL	0.61 (0.31)	0.62 (0.27)	0.02	0.00
ANT	0.57 (0.31)	0.57 (0.28)	0.00	0.00
MMPI-2				
L	50.97 (9.87)	55.87 (9.23)	7.07**	0.06
F	64.63 (14.17)	52.94 (11.10)	22.11***	0.17
K	45.55 (12.44)	54.77 (10.99)	16.41***	0.13
1 Hs	58.19 (12.14)	50.60 (11.07)	11.39***	0.10
2 D	60.05 (12.35)	52.02 (8.75)	14.57***	0.12
3 Hy	57.02 (11.84)	54.06 (13.11)	1.53	0.01
4 Pd	73.37 (11.90)	69.52 (9.19)	3.43*	0.03
5 Mf	54.13 (9.77)	60.69 (9.21)	3.52*	0.03
6 Pa	67.39 (15.09)	60.33 (9.77)	7.90**	0.07
7 Pt	59.32 (11.52)	53.77 (8.25)	7.96**	0.07
8 Sc	61.27 (13.11)	53.92 (8.48)	11.40***	0.10
9 Ma	53.32 (12.72)	54.33 (11.33)	0.18	0.00
0 Si	55.69 (11.06)	44.21 (7.17)	39.00***	0.26
BDHI				
DA	7.39 (4.30)	5.02 (3.09)	10.34**	0.09
IA	7.03 (4.23)	4.12 (2.71)	17.13***	0.14
SD	2.76 (1.33)	2.83 (1.40)	0.08	0.01
UCL				
A	18.15 (3.65)	21.40 (3.69)	21.18***	0.16
P	17.6 (3.82)	17.5 (4.22)	0.06	0.00
AV	17.1 (3.98)	15.7 (3.38)	3.88*	0.04
S	12.4 (3.67)	13.2 (3.50)	1.36	0.01
PR	13.1 (4.02)	10.2 (2.47)	19.89***	0.16
E	6.27 (1.80)	5.69 (1.50)	3.30*	0.03
SST	13.0 (2.73)	13.3 (2.51)	0.34	0.00

Note: MMPI-2 = Minnesota Multiphasic Personality Inventory–2; BDHI = Buss-Durkee Hostility Inventory; UCL = Utrecht Coping List; RSPM = Raven Standard Progressive Matrices; PCL-R = Psychopathy Checklist–Revised; F1 = interpersonal and affective deviance; ADI = arrogant and deceitful interpersonal style; DAE = deficient affective experience; F2 = antisocial behavior; ILL = irresponsible lifestyle; ANT = antisocial behavior; L = Lie; F = Frequency; K = Correction; Hs = hypochondriasis; D = depression; Hy = hysteria; Pd = psychopathic deviate; Mf = masculinity–femininity; Pa = Paranoia; Pt = Psychasthenia; Sc = Schizophrenia; Ma = Hypomania; Si = Social Introversion; DA = direct aggression; IA = indirect aggression; SD = social desirability; A = Active Problem Solving; P = Palliative Reactions; AV = Avoidance; S = Social Support Seeking; PR = Passive/Depressive Reaction; E = Expression of Emotions; SST = Self-Soothing Thoughts.
[a]All calculations are based on *n* = 62 for Cluster 1 and *n* = 48 for Cluster 2 except for RSPM (Cluster 1: *n* = 44, Cluster 2: *n* = 29) and PCL-R (Cluster 1: *n* = 49, Cluster 2: *n* = 32).
[b]Interpretation of partial η^2: 0.0099 = small effect, 0.0588 = medium effect, 0.1379 = large effect.
p < .05. **p* < .01. ****p* < .001.

displayed impressive convergent and discriminant validity in multiple samples, including criminals (Graham, 2012). Moreover, most data indicate that empirically constructed scales possess construct validities broadly comparable with those of rationally/theoretically constructed scales (Burish, 1984). Because the MMPI-2 captures content relevant to a broad variety of widely recognized forms of psychopathology, including depression, anxiety, somatoform disorders, schizophrenia, and bipolar disorder, it is well suited to examining potential psychopathological differences across criminological subtypes. The Dutch MMPI-2 has been validated in male and female healthy controls. The internal consistencies of the basic scales range from .42 (Masculinity/Femininity) to .85 (Psychasthenia) for males and from .39 (Paranoia) to .85 (Psychasthenia) for females. The test–retest reliabilities (after 18 weeks) range from .43 (Paranoia) to .86 (Psychasthenia) for males and .46 (Paranoia) to .88 (Schizophrenia) for females. The convergent and discriminant validities with other measures of psychopathology were adequate (Derksen et al., 1997).

The PCL-R (Hare, 1991/2003; Dutch version: Vertommen, Verheul, De Ruiter, & Hildebrand, 2002) consists of two parts, a semi-structured interview and a review of the subject's file records and history. During the evaluation, the clinician rates 20 items on a 3-point scale (0, 1, 2) that measure characteristics of psychopathy. A total score of 30 or above qualifies a person for a diagnosis of psychopathy. Early exploratory factor analyses of the PCL-R revealed two stable factors (Harpur, Hare, & Hakstian, 1989, but see Cooke & Michie, 2001; Hare, 1991/2003, for alternative factor models): Factor 1 ("emotional detachment") reflects callousness, superficial charm, and narcissism, and appears to be related conceptually to primary psychopathy, whereas Factor 2 ("antisocial Lifestyle") reflects impulsivity, irresponsibility, and aggression, and appears to be related conceptually to secondary psychopathy. In a sample of 1,192 detainees and 440 forensic psychiatric patients, the interrater reliability of the PCL-R items ranged from .42 to .86. The internal consistency of the total PCL-R score was .87 for the detainees and .85 for the forensic psychiatric patients. The test–retest reliability (after 1 month) was .94 (Vertommen et al., 2002). With respect to validity, the two-factor structure of the PCL-R is most often investigated, and this two-factor solution showed good construct and convergent/divergent validity in this sample (Vertommen et al., 2002). Consistent with expectations, Vertommen et al. (2002) found significant correlations between the MMPI-2 Psychopathic deviate scale and Factor 2 of the PCL-R ($r = .22$, $p < .05$), and negative correlations between Factor 1 of the PCL-R and the MMPI-2 Depression ($r = −.26$, $p < .01$), Social Introversion ($r = −.27$, $p < .05$), and Paranoia ($r = −.30$, $p < .01$) scales. Furthermore, Vertommen et al. reported that forensic patients ($n = 80$) who scored high on the PCL-R were more often verbally aggressive ($r = .34$, $p < .01$), more frequently disobeyed clinical rules ($r = .35$, $p = .01$), and showed more threatening behavior toward staff and other patients ($r = .37$, $p < .01$).

The Buss-Durkee Hostility Inventory (BDHI; Buss & Durkee, 1957, Buss & Perry, 1992; Dutch version: Lange, Dehghani, & De Beurs, 1995) consists of 40 items to be rated on a yes/no format. A total of 16 items measure overt aggression, that is, the tendency to express verbal or physical aggression, and 19 items measure covert

aggression, that is, the emotional and cognitive components of aggression, such as hostility, irritability, suspicion, and anger. The 5 highest loading items of the Marlowe-Crowne Social Desirability Inventory (MCSD; Crowne & Marlowe, 1960) were embedded in the BDHI and used to assess social desirability. The reliability and validity of the Dutch BDHI were investigated in three samples: normal controls, psychiatric patients, and detainees ($N = 1,299$). The internal consistencies of the three subscales for the total sample were as follows: overt aggression ($\alpha = .79$), covert aggression ($\alpha = .83$), and social desirability ($\alpha = .50$). The test–retest reliabilities after 6 weeks were as follows: overt aggression ($r = .80$), covert aggression ($r = .90$) and social desirability ($r = .64$). The Dutch BDHI has been shown to distinguish conduct disordered adolescents with high versus low levels of aggression (Lange et al., 1995).

The Utrecht Coping List (UCL; Schreurs, van de Willige, Brosschot, Tellegen, & Graus, 1993) consists of 47 items rated on a 4-point scale and divided across seven scales that measure different coping strategies: Active Problem Solving (e.g., consider several possibilities to solve the problem), Palliative Reactions (e.g., try to feel more comfortable by smoking or drinking), Passive/Depressive Reactions (e.g., ruminate over the past), Avoidance (e.g., wait for better times), Social Support Seeking (e.g., ask someone for help), Expression of Emotions (e.g., show your feelings), and Self-Soothing Thoughts (e.g., remember that after rain sunshine comes). The reliability and validity of the UCL were investigated in a sample of 1,200 healthy controls. A factor analysis yielded a seven-factor solution (see scales above), consistent with theoretical expectation. The internal consistencies of the seven scales for the total sample ranged from .64 (Expression Of Emotions) to .82 (Active Problem Solving). The test–retest reliabilities (after 6 weeks) ranged from $r = .52$ (Palliative Reactions) to $r = .79$ (Active Problem Solving). The convergent and discriminant validity of the UCL was adequate, as evidenced by a positive correlation between UCL-Active Problem Solving scale and Self-Esteem and negative correlations with Neuroticism and the SCL-90 Depression and Anxiety scales, and positive associations between the UCL-Depressive Reactions/Avoidance scales and Neuroticism and the SCL-90 Depression and Anxiety scales (Schreurs et al., 1993).

Finally, different types of offenses (e.g., [attempted] murder, sexual offenses) and different types of substance abuse (e.g., alcohol abuse, drug abuse) were assessed with single dichotomous self-report items (i.e., yes/no) based on the official records.

Because of limitations in the availability of trained staff, the number of participants who received the Raven Standard Progressive Matrices and PCL-R (which require formal training to administer) exceeded the number of participants who received self-report questionnaires.

Statistical Analyses

Model-based cluster analysis was conducted using the S-PLUS 8 software program and the MCLUST library (Fraley & Raftery, 2003). In contrast to traditional forms of cluster analysis, model-based cluster analysis allows investigators to perform statistical
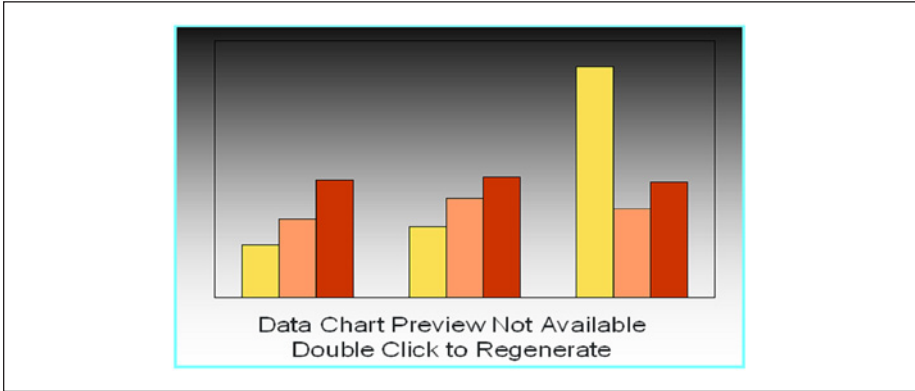
Figure 1. Two major personality subtypes characterized by their standardized Big Five patterns in the total male prisoners sample (*n* = 110).

tests of fit of competing cluster solutions. In this respect, it is better suited to ascertaining the number and nature of clusters in a set of data. Specifically, the relative fit of 10 different models is tested using the Bayesian Information Criterion (BIC). Higher BIC values (i.e., less negative values) indicate models that are a better fit to the data. Model-based cluster analysis was applied to prisoners' *z* scores on the five NEO-FFI scales. After the identification of the best-fitting model, we used multivariate analyses of variance (MANOVAs) and the χ^2 test statistic to detect significant differences between the subtypes with respect to interval-scaled and nominal external measures.

Results

Cluster Identification and Description

BIC values for the NEO-FFI ranged from −1,584.012 to −1,997.235. The best-fitting model identified two clusters. Figure 1 presents mean *z*-standardized NEO-FFI scale scores for the two subtypes in the total sample. The first subtype (*n* = 62) is marked by a positive score on Neuroticism and negative scores on the remaining four dimensions, resembling the undercontrolled/emotionally dysregulated or aggressive subtype. The second subtype (*n* = 48) is marked by a negative score on Neuroticism and positive scores on the remaining four dimensions, resembling the resilient/emotionally stable subtype. These prisoners show a superficially normal social presentation in the presence of behavioral deviance. The two subtypes displayed significant differences on each of the Big Five personality traits, Wilks's Lambda = 0.36, *F*(5, 104) = 36.52, *p* < .001, partial η^2 = 0.63: Undercontrolled prisoners showed significantly higher scores on Neuroticism and lower scores on Extraversion, Agreeableness, Openness, and Conscientiousness compared with resilient prisoners (see Figure 1).

External Validation of Clusters

In Table 1, means and standard deviations of the external validation measures are described for each personality clusters. The two personality clusters did not significantly differ with respect to age.

However, resilient prisoners scored significantly higher on fluid intelligence compared with undercontrolled prisoners (Table 1).

On the PCL-R, we did not find significant differences between both subtypes with respect to the total score, Factor 1, Factor 2, and the four subscales, Wilks's Lambda = 0.93, $F(7, 73) = 0.76$, *ns*.

On the validity and basic scales of the MMPI-2, as predicted, we found significant differences between the two groups, Wilks's Lambda = 0.63, $F(13, 96) = 4.27$, $p < .001$ (see Table 1). Undercontrolled prisoners scored significantly higher on the *F*-scale (Infrequency), and all basic scales (except the Hypomania scale) compared with resilient prisoners. However, on the Lie (L) and Defensiveness (K) scales, resilient prisoners scored significantly higher than undercontrolled prisoners. Furthermore, we used the *T*-scores ($M = 50$, $SD = 10$) to compare prisoners' scores with those of normal controls (Butcher et al., 1989). The mean scores of both personality subtypes are situated around those of normal controls, $M = 50 \pm 10$ (1 *SD*). Only on the Psychopathic deviate scale and the Paranoia scale did undercontrolled prisoners show significantly higher scores than normal controls.

With regard to BDHI scores, we found significant differences between the subtypes, Wilks's Lambda = 0.81, $F(3, 106) = 8.44$, $p < .001$. As expected, the results showed that the undercontrolled prisoners showed significantly higher levels of (in) direct aggression than the resilient prisoners. However, on the Social Desirability scale, the personality subtypes did not differ significantly. Compared with normal controls (derived from the BDHI manual), prisoners of both subtypes scored within the range of normal controls ($M \pm 1$ *SD*) on each of the three BDHI scales.

We found significant differences between the personality subtypes with respect to coping styles, Wilks's Lambda = 0.71, $F(7, 102) = 5.84$, $p < .001$. Undercontrolled prisoners showed significantly higher scores on Avoidance, Passive/Depressive Reactions, and Expression of Emotions compared with resilient prisoners. In contrast, resilient prisoners showed a significantly higher score on Active Problem Solving Behaviors, compared with undercontrolled prisoners. Compared with male normal controls, prisoners of both subtypes scored within the normal range ($M \pm 1$ *SD*).

Finally, we compared the prevalence of different crimes (e.g., murder attempt, sexual offenses) and substance abuse (alcohol, drugs) among both personality subtypes. Undercontrolled prisoners reported significantly more sexual offenses, $\chi^2(1) = 2.84$, $p < .05$, compared with resilient prisoners. However, both types of prisoners showed a comparable number of murder (attempts), $\chi^2(1) = 0.40$, *ns*. Undercontrolled prisoners showed significantly more drug abuse, $\chi^2(1) = 3.91$, $p < .05$, as predicted, but no more alcohol abuse compared with resilient prisoners, $\chi^2(1) = 1.45$, *ns*.

Discussion

The goal of this study was to identify personality subtypes in a sample of 110 male prisoners on the basis of the FFM personality dimensions. We identified two distinctive personality subtypes and examined the implications of these two subgroups of prisoners for a broad array of indicators relevant to psychopathology, aggression, substance abuse, and coping styles. These two subtypes accord broadly with the primary and secondary psychopathy variants posited in classic writings by Karpman (1941) and identified in previous, but thus far sparse, cluster analytic work on psychopathy and antisocial personality disorder (Hicks et al., 2004; Poythress et al., 2010). Nevertheless, our findings go beyond previous research in clarifying the implications of these clusters for aggression, substance abuse, and coping styles. In addition, they demonstrate that these two subtypes can be recaptured not only from measures of normal-range personality traits but also from a widely used omnibus measure of psychopathology, namely, the MMPI-2.

Prisoners in the second cluster were characterized by low scores on Neuroticism and high scores on the remaining four dimensions, reflecting the appearance of relatively adaptive functioning. In personality research (Asendorpf, Borkenau, Ostendorf, & van Aken, 2001; Herzberg & Hoyer, 2009; Herzberg & Roth, 2006), this subtype has been called resilient/high functioning; in psychopathy research, it has been called emotionally stable (Hicks et al., 2004) or primary psychopathy (see Karpman, 1941). Prisoners in the first cluster were characterized by high scores on Neuroticism and low scores on the remaining four dimensions, reflecting the appearance of maladaptive functioning. In personality research (Asendorpf et al., 2001; Herzberg & Hoyer, 2009; Herzberg & Roth, 2006), this subtype has been called undercontrolled; in psychopathy research, it has been called aggressive (e.g., Hicks et al., 2004) or secondary psychopathy.

Comparisons between the clusters on external measures provided a more fine-grained understanding of these subtypes and supported some, but not all, of the hypotheses. We did not find a significant difference between both personality clusters with respect to age. However, the resilient cluster scored significantly higher on intelligence compared with the undercontrolled cluster, and this result was associated with a medium effect size.

Contrary to prediction, we found no significant differences on the PCL-R or its factors, although the relatively low statistical power of our investigation should be borne in mind when interpreting this negative finding. The difference for PCL-R Factor 1 was in the expected direction, with resilient prisoners scoring slightly higher than undercontrolled prisoners, but this difference did not attain significance. One potential reason for this negative finding (in addition to low statistical power) is that PCL-R Factor 1 may be only weakly saturated with the construct of boldness, which may be a key element of resilience among offenders (see Lilienfeld et al., 2012). This possibility dovetails with the fact that social poise and immunity to anxiety are among the key components of boldness (Patrick, Fowles, & Krueger, 2009). In contrast, positive

results might have emerged with Factor 1 of psychopathy measures that contain more of a boldness component, such as the Psychopathic Personality Inventory (PPI; Lilienfeld & Andrews, 1996).

With respect to the MMPI-2 scales, which assess a diverse range of psychopathological features, we found that—as expected—undercontrolled prisoners scored significantly higher on the MMPI-2 F-scale (Frequency) and most basic scales compared with resilient prisoners, and all differences were associated with medium to large effect sizes. The finding for the F-scale (Frequency) probably reflects the heavy saturation of this scale with psychological distress (Graham, 2012). The only nonsignificant difference between groups on the MMPI-2 was on the Ma scale (Hypomania), which may reflect its partly adaptive content (e.g., high levels of energy and self-esteem; see Graham, 2012).

Furthermore, as predicted, undercontrolled prisoners scored higher on (in)direct measures of Aggression, Expression of Emotions, and Depressive Reactions, consistent with theory and research that secondary psychopaths are prone to global maladjustment. Finally, individuals within this group reported higher levels of drug abuse (see also Smith & Newman, 1990) and committed more sexual offenses than resilient prisoners. Like undercontrolled prisoners in earlier studies (e.g., Herzberg & Hoyer, 2009; Herzberg & Roth, 2006) and aggressive psychopaths (Hicks et al., 2004), they also showed more psychopathology and more impulse-control problems; these findings are not surprising given their high score on Neuroticism, and low scores on Conscientiousness (reflecting lack of constraint) and Agreeableness (consistent with the high scores on indirect aggression and paranoia).

In contrast, prisoners in the resilient cluster showed—compared with the undercontrolled cluster—higher scores on the MMPI-2 L and K (Correction) scales. Although these elevations could reflect a heightened propensity toward impression management, the psychological literature suggests that they are more likely to reflect veridical reporting of self-confidence, adequate adjustment, and minimal distress (McCrae & Costa, 1983; Piedmont et al., 2000). Indeed, the longstanding assumption that social desirability scales, including the MMPI-2 L and K (Correction) scales, typically reflect dishonest responding is increasingly being called into question by data showing that these scales are associated with genuine personality variance and rarely operate as suppressor variables as intended (McGrath, Mitchell, Kim, & Hough, 2010; Uziel, 2010). Furthermore, resilient prisoners scored higher on Active Problem Solving compared with undercontrolled prisoners, which might be linked to their higher intelligence score of resilient prisoners. Overall, as predicted, the resilient-like prisoners seem to be better adjusted than the undercontrolled prisoners and less marked by distress. Like a number of other authors (e.g., Hicks et al., 2004), our findings suggest that a subgroup of offenders, namely, those similar to primary psychopaths, are reasonably emotionally stable and socially poised, even though they are at elevated risk for antisocial and criminal behavior. These results are also broadly consistent with the clinical observations of Cleckley (1941/1988), who noted that classic psychopaths are often largely immune to anxiety, distress, and other "neurotic" symptoms.

Despite the strengths of our study, several limitations need to be acknowledged and addressed in future work (see also Hicks et al., 2004). Our sample included only male prisoners, so future studies should investigate female prisoners, and children and adolescents with behavioral problems. In addition, some of our negative findings may be attributable to low statistical power and therefore must be interpreted with caution. One additional limitation is that we did not have access to participants' formal criminal records. In future research, it would be helpful to validate the clusters we obtained against participants' crimes and other antisocial behaviors. For example, one might expect individuals in the emotionally dysregulated cluster to commit more reactively violent crimes than those in the resilient-like cluster. Finally, limiting ourselves to a legally defined sample could have excluded participants who were intelligent enough to escape detection, which could in turn have affected the cluster composition in unknown ways.

These limitations notwithstanding, we identified two distinctive personality subtypes that may bear theoretically and practically important implications for different pathways to criminal offenses, for assessment, and for treatment. Concerning assessment, our findings are the first to show that the MMPI-2, despite its well-known limitations (e.g., substantial correlations among most clinical scales, lowering their discriminant validity; see Helmes & Reddon, 1993), elucidates the differences between the resilient and the undercontrolled groups, and corroborates previous conjectures that the latter group is more often marked by high levels of psychological distress.

Concerning treatment, our findings and those of others raise the possibility that different intervention strategies may be needed to help prisoners with different personality dispositions. For example, prisoners who are resilient may benefit from more cognitive or insight-oriented interventions (given their low scores on depression and emotion-focused coping styles), whereas prisoners who are impulsive and emotional may benefit more from concrete behavioral control strategies (given their higher scores on (in) direct aggression and lower scores on active problem-solving strategies), although systematic research is needed to bear out this hypothesis. In addition, although not explicitly predicted, our findings provide the first evidence to our knowledge that these two subtypes differ in their preferred coping styles, which treatment providers may wish to harness to their advantage. For example, our finding that resilient prisoners often use active problem-solving styles suggests that these individuals may benefit from interventions that encourage them to take a direct role in resolving their life difficulties. Although considerable pessimism surrounding the treatment of psychopathy exists, some researchers have found evidence supporting the treatability of psychopaths (Salekin, 2002). For example, Caldwell, Skeem, Salekin, and Van Rybroek (2006) showed that certain intensive treatment strategies lead to lower rates of recidivism in youth offenders with high levels of psychopathic features. A greater understanding of psychopathy subtypes and etiological influences (i.e., differing coping styles) may aid in even more effective treatment of this still poorly understood disorder

Finally, even though we identified two separable subgroups using cluster analysis, our findings should not be taken to imply that these subgroups necessarily differ

qualitatively (i.e., in kind). Instead, these two subgroups may represent substantially different densifications on personality dimensions in multivariate space.

Declaration of Conflicting Interests

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