

# Exploring Associations Between Psychopathic Personality and Components of Disinhibition vs. Constraint

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**Abstract** Recent models of psychopathy implicate Disinhibition vs. Constraint (DvC) as one of the primary underpinnings of psychopathic traits, although little research has examined associations between specific DvC components and psychopathy facets. The present study aimed to fill this gap by examining associations between psychopathy facets, as operationalized by two widely used self-report psychopathy instruments, and lower-order components of DvC within a racially diverse sample of 1,160 undergraduates. Path analyses confirmed the broad dimension of DvC as representing a general diathesis to psychopathy, with second-order components conferring more specific risks for particular psychopathy traits regardless of the model of psychopathy employed. Further, findings suggest that associations do not vary by race. Results suggest both generality and specificity of DvC dimensions as they relate to psychopathic traits, as well as potential avenues for further investigation of the associations between psychopathy and DvC.

**Keywords** Psychopathy · Disinhibition · Low perseverance · Low premeditation · Agreeableness

## Introduction

Psychopathic personality (psychopathy) refers to a cold, callous, unremorseful, devious, glib, and manipulative interpersonal style

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(Cleckley 1941). Despite psychopathy's relevance to both criminal and non-criminal populations (Lykken 1995), much of the research on this condition has focused on forensic samples, with less emphasis on community samples. Since Cleckley's (1941) initial conceptualization of psychopathy, an extensive body of empirical and theoretical work has been conducted in the service of elucidating the core traits of this construct (e.g., Patrick et al. 2009; Marcus et al. 2013). As poor impulse control has repeatedly been noted as a cardinal feature of psychopathy (Cleckley 1941; Poythress and Hall 2011), some of this work has emphasized traits within the broad temperament dimension of Disinhibition vs. Constraint (DvC), the general tendency to behave in an under- (vs. over-) controlled manner (Clark and Watson 2008). Although DvC appears to form a meaningful higher-order dimension, its lower-order components may display differential linkages to psychopathy and its sub-dimensions. With these considerations in mind, the purpose of the current study was to elucidate more fine-grained associations between models of psychopathy and factor analytically-derived lower-order components of DvC within a large, racially diverse sample.

## Psychopathy

Psychopathy is a multidimensional construct (Patrick et al. 2009) with subcomponents reflecting interpersonal, affective, and behavioral dimensions. As such, a number of self-report measures have been developed for assessing this construct in non-criminal populations. One of the most widely used instruments is the Psychopathic Personality Inventory-Revised (PPI-R, Lilienfeld and Widows 2005). Designed using a bottom-up approach aimed at assessing personality features characteristic of psychopathy, the PPI-R traditionally consists of two higher-order factors, Fearless Dominance and Self-Centered Impulsivity (Benning et al. 2005, 2003), along with a third stand-alone dimension consisting of only the subscale

of Coldheartedness (but see Neumann et al. 2008 for an alternative factor structure).

Fearless Dominance is associated with many of the core affective and interpersonal features of psychopathy, including social and physical boldness, charm, glibness, and relative immunity to anxiety, and is tied to the more socially adaptive features of psychopathy (Lilienfeld et al. 2012a). In contrast to Fearless Dominance, Self-Centered Impulsivity is associated with most of the behavioral features of psychopathy, including manipulativeness, egocentricity, aggressiveness, impulsivity, and a propensity toward antisocial actions (Benning et al. 2003, 2005). Coldheartedness, one of the eight lower-order subscales of the PPI-R, does not load highly onto either of these factors and presumably represents a separate subgroup of traits, potentially tied to the other affective features of psychopathy, such as lack of guilt and remorse, callousness, and absence of deep-seated social emotions (e.g., love, loyalty, sentimentality).

Another widely-used self-report measure is the Levenson Self-Report Psychopathy scale (LSRP; Levenson et al. 1995). Designed explicitly to assess psychopathy in congruence with the two-factor structure of the Psychopathy Checklist-Revised (PCL-R; Hare 1991, 2003; Cooke et al. 2007), the LSRP is one of the most extensively validated measures of psychopathy. Consistent with a PCL-R conceptualization of psychopathy, the LSRP separates psychopathic features into an interpersonal/affective component, the “primary psychopathy” scale, and a behavioral/antisocial component, the “secondary psychopathy” scale. The LSRP primary scale is associated with egocentricity, callousness, and manipulativeness, whereas the secondary scale is associated with impulsivity and antisocial behavior (Levenson et al. 1995), although this distinction has not been found consistently across studies (e.g., Lilienfeld and Fowler 2006). In general, although data on the external correlates of the LSRP and PPI-R suggest moderate overlap between these two conceptualizations, the PPI-R assesses more of the interpersonally adaptive features of the psychopathy construct including interpersonal and physical boldness (Sellbom and Phillips 2013).

Taken together, although the boundaries of psychopathy are not entirely agreed upon, the literature clearly suggests psychopathy is multidimensional. Investigations of differential correlates of the various components are critical for elucidating common and distinct etiological processes underlying this heterogeneous condition. Moreover, such investigations may shed light on the implications of differing conceptualizations of psychopathy.

#### Disinhibition vs. Constraint (DvC)

Similar to psychopathy, DvC is also best understood as a multidimensional construct. DvC is one of the broad, higher-order dimensions in the prominent three-factor or “Big Three”

model of personality (Tellegen 1985; Watson et al. 1994). Within the Big Three model, DvC is a temperamental dimension that is largely orthogonal to the other two dimensions (Negative and Positive Emotionality) (Clark and Watson 2008). A number of structural models have been proposed to characterize the lower-order dimensions or components within this domain. For example, Whiteside and Lynam’s (2001) UPPS model posits four constructs associated with impulsive behavior: Urgency, lack of Premeditation, lack of Perseverance, and Sensation Seeking. Urgency and Sensation Seeking relate positively to Neuroticism and Extraversion, respectively, and are traits traditionally outside of the Big Three–DvC domain. Conversely, lack of Premeditation and lack of Perseverance are key components of DvC (Latzman and Vaidya 2013).

Within the temperament-based Big Three model, another prominent model with extensive empirical support, posits that DvC is a higher-order factor that can be decomposed into the Big Five traits of Agreeableness and Conscientiousness (Clark and Watson 2008; Markon et al. 2005; Watson et al. 1994). Importantly, this conceptualization is not novel. Indeed, several longstanding Big Three models comport with the notion that in addition to (low) Conscientiousness, (low) Agreeableness and closely related traits (e.g., cruelty, hostility) are part of the DvC dimension. For example, Eysenck’s (1990) Psychoticism, a dimension that almost surely mislabeled, is similar to DvC (Clark and Watson 2008) and is largely a blend of impulsiveness, vindictiveness, and cruelty. Underscoring this point, Aggression in both the Multidimensional Personality Questionnaire (MPQ; Tellegen 1985; Tellegen and Waller 2008) and Schedule for Nonadaptive and Adaptive Personality (SNAP; Clark 1993) cross-loads on Constraint and Disinhibition, respectively. Consistent with the Big Three model contention that DvC consists not only of Conscientiousness but also Agreeableness-related content, as well as the emerging consensus that DvC can be divided meaningfully into distinct dimensions (Roberts et al. 2004; Whiteside and Lynam 2001), Vaidya and colleagues (2010) found that the broad temperamental dimension of DvC can be deconstructed into three lower-order components: low Accomplishment, low Self-Control, and low Agreeableness. Low Accomplishment maps onto the lack of Perseverance scale in the UPPS model while low Self-Control maps onto the UPPS model’s lack of Premeditation scale (see Latzman and Vaidya 2013). This conceptualization of these two Conscientiousness-related components is consistent with previous studies that have revealed Conscientiousness to be multidimensional (e.g., Roberts et al. 2004, 2005). For example, Costa and McCrae (1998) argued that Conscientiousness’ diverse subcomponents can be understood to fall into two major groupings, proactive and inhibitive. The third dimension described in Vaidya and colleague’s conceptualization of DvC, low Agreeableness, however, is not represented in the UPPS model, although it is one of the traits in the Big Five model (see

Fig. 1). The recognition of these various subcomponents of the broader DvC dimension is important, particularly as it relates to the multidimensional construct of psychopathy. Specifically, examination of various empirically-based components of DvC may allow for better discrimination among different features of the heterogeneous psychopathy construct.

## Psychopathy and DvC

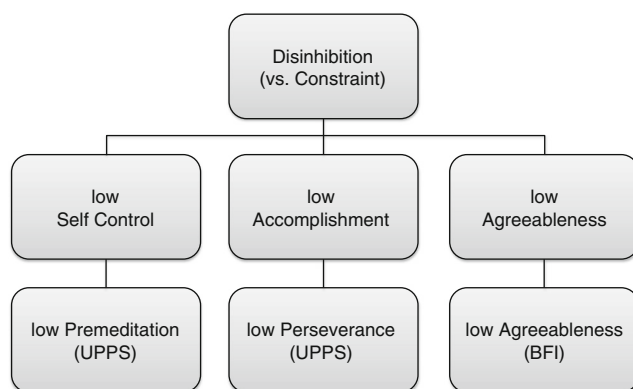
DvC represents a general diathesis to the externalizing spectrum of behaviors (e.g., aggression, alcohol use), whereas second-order components confer risks for more specific behaviors (e.g., aggression, alcohol use and misuse; Latzman et al. 2011; Latzman and Vaidya 2013), suggesting both generality and specificity with regard to associations between DvC and externalizing behaviors. Recent meta-analytic findings confirm the importance of considering Big Five personality traits at the facet-level with regard to associations with unidimensional indicators of psychopathy (DeCuyper et al. 2009). To date, however, examinations of associations between factor-analytically derived lower-order components of DvC that integrate across both subcomponents of Conscientiousness- and Agreeableness-related content and psychopathy, a constellation of traits that are thought to fall largely within the externalizing spectrum (e.g., Krueger 2006), are limited. This neglect is surprising for a number of reasons, including the fact that certain features of psychopathy are particularly selective to DvC, especially antisocial behavior and lack of foresight (Patrick et al. 2009). Thus, in the context of the aforementioned psychopathy factor models, DvC is ostensibly most strongly associated with PPI-R Self-Centered Impulsivity and with LSRP secondary psychopathy; less is known with regard to PPI-R Coldheartedness. Recent meta-analytic findings (Marcus et al. 2013) confirm the association between PPI-R Self-Centered Impulsivity and Constraint, the opposite pole of Disinhibition ( $r=-0.44$ ), but findings with regard to PPI-R Fearless Dominance were less

clear. Although no association emerged with Constraint overall, there was considerable heterogeneity among studies that could be explained by whether the sample was forensic ( $r=0.23$ ) or non-forensic ( $r=-0.14$ ). Finally, a small but statistically significant association between Coldheartedness and Constraint emerged ( $r=-0.15$ ).

With regard to the LSRP, although both primary and secondary psychopathy have been found to relate to various self-report measures of DvC-related content (Levenson et al. 1995; Miller et al. 2008), the association for secondary psychopathy tends to be substantially higher. Furthermore, the association between primary psychopathy and DvC becomes non-significant when accounting for the shared variance with secondary psychopathy (Miller et al. 2008). Taken together, the broad dimension of DvC appears to be associated with psychopathy in general, and specific components of psychopathy are probably differentially associated with various lower-order DvC components. Nonetheless, few studies have investigated associations between various dimensions of competing theoretical models of psychopathy and lower-order components of DvC and even fewer studies have considered the ways in which these associations may vary by race/ethnicity. Such information could inform and enrich our understanding of the multidimensionality of both psychopathy and Disinhibition, the latter of which has long been regarded as a key component of psychopathy (Patrick et al. 2009).

## Race and Psychopathy

With regard to the impact of demographic characteristics, most previous studies with non-incarcerated samples have included samples of primarily White participants. As such, there has been considerable increased interest in examining psychopathy across various ethnic and racial groups. To date, although the construct validity of psychopathy measures has been demonstrated across ethnicities, the extant literature is largely equivocal with regard to racial differences in the relation between psychopathy and external correlates, specifically with DvC-related traits (e.g., impulsivity, sensation seeking) (Kosson et al. 1990). Specifically, whereas some studies have found more pronounced associations between psychopathy and self-report, interview-based, and laboratory measures of impulsivity among Whites than among African-Americans (e.g., Kosson et al. 1990; Thornquist and Zuckerman 1995; Jackson et al. 2007), others have not found significant racial differences (e.g., Sullivan and Kosson 2006; Vachon et al. 2012). The majority of previous studies in this area, however, have included incarcerated or high-risk samples with relatively fewer examining community-based samples. The lack of consistent findings concerning external correlates of psychopathy highlights the need for continued investigation of racial differences in psychopathy across racial groups, particularly with respect to associations with DvC-



**Fig. 1** Disinhibition vs. Constraint Model.

Note. UPPS UPPS Impulsivity Scale. BFI Big Five Inventory

related content. Further underscoring the importance of race/ethnicity considerations is an extensive body of research suggesting that race/ethnicity may be best understood as a proxy for sociodemographic context and cultural experience (Sampson et al. 2005). Exposure to such contexts and experiences has been found to attenuate associations between individual differences and a variety of interpersonal outcomes (e.g. Raine and Venables 1981; Raine et al. 1997).

### Current Study

The current study aimed to fill a gap in the literature by examining associations between sub-dimensions of psychopathy and components of DvC in the service of elucidating general and more specific associations between the dimensions of these broad constructs. Specifically, we examine associations between three previously explicated second-order components of DvC and facets of psychopathy within both two- and three-factor models of psychopathy. To do so, we utilized the two most widely-used self-report measures of this condition which have been found to differ somewhat in their coverage of the adaptive versus maladaptive features of psychopathy. We reasoned that detecting specific relations between components of DvC and psychopathy may help to identify etiological processes by which various DvC components relate to sub-dimensions of psychopathy.

As a secondary and more exploratory goal, we examined whether the associations between psychopathy and DvC vary by race, as these analyses may bear implications for the differential correlates and perhaps etiology of these two broad constructs across ethnic/racial groups. As noted earlier, some authors have reported racial differences in the relationship between psychopathy and DvC-related traits, although these findings have been preliminary and inconsistent (Sullivan and Kosson 2006), whereas others have found external correlates to be invariant across races (Vachon et al. 2012).

Consistent with previous findings, we expected to find significant associations between DvC and psychopathy, including distinct associations between DvC and specific dimensions of psychopathy. We anticipated unique associations between DvC and PPI-R Self-Centered Impulsivity as well as LSRP secondary psychopathy. Based on prior findings (e.g., Miller et al. 2008; Poythress and Hall 2011; Ray et al. 2009), when various facets of psychopathy are examined simultaneously to account for common variance, we expected both low Perseverance and low Premeditation to be associated with PPI-R Self-Centered Impulsivity and LSRP Secondary Psychopathy. Given significant negative associations between Coldheartedness and Agreeableness (e.g., Seibert et al. 2011), we expected Agreeableness to be significantly negatively associated with Coldheartedness. Given previous findings of significant negative associations between

Agreeableness and both LSRP primary and secondary psychopathy, with a stronger association with the former, we expected low levels of Agreeableness to evidence a significant association with primary, but not secondary, psychopathy. Further, given recent but controversial evidence that certain aspects of psychopathy, especially Fearless Dominance (Boldness) may be associated with interpersonally adaptive outcomes, such as leadership and achievement (e.g., Lilienfeld et al. 2012a, b), we expected low Perseverance to be negatively associated with PPI-R Fearless Dominance. Additionally, although some studies have found the validity of psychopathy to be invariant across races (Vachon et al. 2012), given previous findings that the relation between psychopathy and DvC-related traits may be specific to White but not Black samples (Kosson et al. 1990; Thornquist and Zuckerman 1995), we provisionally expected associations to vary by race. As the current study represents the first investigation of associations between these components of DvC and psychopathy, we advanced no specific a priori hypotheses regarding racial differences in the direction of these associations.

## Methods

### Participants

Participants were 1,169 undergraduates between the ages of 18 and 58 years ( $M_{age}=20.71$ ,  $SD=4.65$ ; 72.9 % female) who completed an online survey in partial fulfillment of a research exposure requirement at a large public university in the Southeastern United States in a highly racially diverse city. Consistent with the demographics of the university at which data were collected, the sample was racially diverse, with 37.6 % self-identifying as Black/African-American, 33.6 % as White, 14.5 % as Asian/Asian-American and 14.3 % as other. About 54 % reported having at least part-time employment. On the basis of extreme responding on PPI-R validity scales, 9 participants were excluded from subsequent analyses, resulting in a final sample of 1,160. All participants accessed a secure website where they provided informed consent and completed the surveys. All procedures were approved by the university's Institutional Review Board.

### Measures

Participants completed two self-report measures of psychopathy. In addition, as no single DvC measure assesses all three components identified by previous work (Vaidya et al. 2010), consistent with previous research (e.g., Litzman and Vaidya 2013), participants in the present study completed two instruments to assess these components (see Fig. 1).



### Measures of Psychopathic Personality

**Psychopathic Personality Inventory-Revised** The Psychopathic Personality Inventory-Revised (PPI-R; Lilienfeld and Widows 2005) is a 154-item self-report measure of psychopathy that asks respondents to describe themselves using a 4-point Likert-type scale. The PPI-R yields a total score reflecting global psychopathy, as well as scores on eight content scales reflecting lower-order features of psychopathy. Higher-order factor analyses of these scales have sometimes yielded a two factor solution (see Benning et al. 2003), with Fearless Dominance (PPI-I) consisting of summed scores on the PPI-R Fearlessness, Social Potency, and Social Immunity content scales and Self-Centered Impulsivity (PPI-II) consisting of summed scores on the PPI-R Machiavellian Egocentricity, Rebellious Nonconformity, Blame Externalization, and Carefree Nonplanfulness content scales. An eighth content scale, Coldheartedness, does not load highly on either PPI-I or PPI-II and is typically treated as a stand-alone factor in analyses. As noted earlier, the PPI-R also contains three validity scales designed to detect response styles deemed to be potentially problematic in psychopathy (Lilienfeld and Fowler 2006): Virtuous Responding (designed to detect positive impression management), Deviant Responding (designed to detect malingering and other forms of aberrant responding), and Inconsistent Responding (designed to detect random or inconsistent responding; see Lilienfeld and Widows 2005). The PPI-R and its parent measure, the PPI, have shown impressive convergent and discriminant validity with a variety of theoretically relevant external criteria (Lilienfeld and Andrews 1996; Lilienfeld and Fowler 2006; Lilienfeld and Widows 2005). Within the current sample, the PPI-R demonstrated good internal consistency, with Cronbach's alphas across the eight content scales ranging from 0.80 for Stress Immunity to 0.87 for Carefree Nonplanfulness ( $Mdn = 0.84$ ).

**Levenson Self-Report Psychopathy Scales** The Levenson Self-Report Psychopathy Scales (LSRP; Levenson et al. 1995) is a 26-item questionnaire designed to measure psychopathic personality traits and behaviors in non-institutionalized populations. Participants endorse items on a 4-point Likert-type scale. The LSRP yields two factor-analytically derived scores, Primary and Secondary psychopathy, that map approximately onto the two-factor structure of the PCL-R, the traditional method of assessing psychopathy using clinical interviews and institutional records (Hare 1991, 2003). As noted earlier, the Primary scale reflects callousness and manipulation of others (but see Lilienfeld and Fowler 2006, for evidence that this scale also assesses a predisposition toward impulsive and antisocial behavior, although probably less strongly than the Secondary scale), whereas the Secondary scale reflects impulsive and under-controlled behavior. The LSRP scales exhibit good internal consistency as well as

convergent validity with other psychopathy measures (e.g., PCL-R; Brinkley et al. 2001). Within the current sample, the LSRP scales demonstrated adequate internal consistency, with Cronbach's alphas of 0.87 for Primary and 0.75 for Secondary psychopathy.

### Measures of Disinhibition (vs. Constraint)

**Big Five Inventory (BFI)–Agreeableness** To assess the DvC component of Agreeableness, the Big Five Inventory (BFI; John and Srivastava 1999) Agreeableness scale (e.g. “I am someone who likes to cooperate with others”) was used. The BFI is a 44-item measure designed to assess the Big Five personality traits. Participants respond to the items using a 5-point Likert-type scale ranging from 1 = *Disagree Strongly* to 5 = *Agree Strongly*. BFI scales show good psychometric properties, with alpha reliabilities typically ranging from 0.75 to 0.90 (John et al. 2008) and convergent validity with other Big Five inventories (e.g., Watson and Hubbard 1996). In the current sample, the internal consistency for Agreeableness was 0.78. Higher scores on this scale reflect lower levels of DvC.

**UPPS-P Impulsivity Scale–(Lack of) Premeditation and (Lack of) Perseverance** The UPPS-P Impulsivity Scale (UPPS-P; Whiteside and Lynam 2001; Cyders et al. 2007) is a 59-item instrument that uses a 4-point Likert-type scale. This measure is designed to assess separable personality pathways to impulsive behavior. Consistent with previous research (e.g., Latzman and Vaidya 2013), for the current study, the (lack of) Perseverance scale (e.g., “I am a person who always gets the job done,” reversed) and the (lack of) Premeditation scale (e.g., “I like to stop and think things over before I do them”, reversed) were used respectively to index components akin to low Accomplishment and low Self-control from the previously three component model of DvC (see Vaidya et al. 2010; Latzman and Vaidya 2013). Subscales of the UPPS-P demonstrate excellent internal consistency and convergent validity with other measures that assess DvC-related traits (Cyders et al. 2007; Whiteside and Lynam 2001). In the current sample, internal consistencies were 0.85 for (lack of) Perseverance and 0.87 for (lack of) Premeditation. Based on the keying of these scales, higher scores are associated with higher levels of DvC.

### Analyses

We first examined the zero-order correlations between the three DvC scales and measures of two- and three-factor models of psychopathy. Using Mplus Version 7.0 (Muthen and Muthen 1998–2012), we fit path models using maximum likelihood estimation with robust standard errors (MLR) to examine associations between the three DvC components and

psychopathy simultaneously in two separate models. We chose to examine these models separately as each assesses different features of psychopathy developed within disparate traditions. The first model examined associations between DvC components and the three-factor model derived from the PPI-R, whereas the second examined associations between DvC components and the two-factor model derived from the LSRP. Specifically, we examined the three-factor model derived from the PPI-R with a single path model with all three psychopathy factors examined simultaneously and allowed to correlate, which accounts for shared variance among them. The three DvC components were also allowed to correlate. The same approach was used in the second model examining the two-factor psychopathy model derived from the LSRP. Initially, given the heterogeneity of the sample, sex, age, and race (given Black/African-Americans constituted the largest racial group, race was dummy coded as 1 = Black/African-American and 0 = Other) were included in both models as covariates. Next, to examine whether associations between components of DvC and psychopathy varied by race, a subset of participants that included the two largest racial groups, White and Black/African-American ( $N=832$ , 52.8 % African-American), were examined via two sets of multigroup path analyses. Specifically, for each conceptualization of psychopathy (i.e., PPI-R and LSRP) a model in which regression weights were constrained between the two groups was compared to a model in which regression weights were free to vary. Model fit was evaluated using the Bayesian information criterion (BIC) and Draper's information criterion (DIC), two widely used model selection indices that in simulation studies have been shown to perform well across a range of conditions (Markon and Krueger 2006). This approach to model selection involves the comparison of omnibus criteria (i.e., BIC, DIC) which value a model's goodness of fit and reward more parsimonious models (Royle and Dorazio 2008).

## Results

### Bivariate Correlations Among Study Variables

Table 1 shows bivariate correlations among components of DvC and psychopathy. Consistent with previous research (Latzman et al. 2011; Latzman and Vaidya 2013) all three DvC components evidenced moderate to large correlations with each other. Specifically, low Perseverance and low Premeditation were strongly associated with one another ( $r=0.67$ ) whereas Agreeableness evidenced moderate correlations with the other components ( $r_s=-0.48$  and  $-0.41$  with low Perseverance and low Premeditation, respectively). With regard to associations between components of DvC and facets of psychopathy, correlations ranged from negligible to large. Specifically, PPI-R Fearless Dominance evidenced a small

association with low Perseverance ( $r=-0.20$ ) and was largely unrelated to low Premeditation and Agreeableness. PPI-R Self-Centered Impulsivity was strongly associated with all three DvC components ( $Mdn r = 0.58$ ). Lastly, PPI-R Coldheartedness evidenced a moderate negative association with Agreeableness ( $r=-0.50$ ) and small associations with low Perseverance and low Premeditation ( $r_s=0.21$  and  $0.19$ , respectively). Further, both LSRP primary and secondary psychopathy evidenced moderate to strong significant associations with all three DvC components, with primary psychopathy most strongly associated with Agreeableness ( $r=-0.61$ ) and secondary psychopathy most strongly associated with low Perseverance ( $r=0.62$ ).<sup>1</sup>

### Measurement Invariance Analyses

Prior to conducting path analyses and subsequently examining whether associations varied by race, we first fit a series of multi-group confirmatory factor analysis (CFA) models to examine the measurement equivalence of the psychopathy construct, both within a PPI-R and a Levenson framework. Specifically, we fit three models. The first model assumed race-related factor loading and mean-level differences. In this model, both factor loadings and latent means were constrained to be equal between groups. The second model assumed race-related factor loading invariance but allowed latent means to vary between groups indicating factor-level invariance but mean-level differences between groups. The third model assumed complete invariance. In this model, both factor loadings and latent means were constrained to be equal between groups. PPI-R scales were used as indicators for Fearless Dominance and Self-Centered Impulsivity and item-level data were used as indicators for PPI-R Coldheartedness. Items served as indicators for Levenson factors.

For the PPI-R, the best fitting model was one in which loadings were constrained to be equal between groups but latent means were freed to vary ( $\chi^2=2734.32$ ,  $\ln(L)=$

<sup>1</sup> For readers interested in bivariate correlations between PPI-R and Levenson psychopathy dimensions and the other UPPS-P scales, they are provided here. PPI-R FD was correlated with Negative Urgency (NU), Sensation Seeking (SS), and Positive Urgency (PU) at  $r_s=-0.11$  ( $p<0.001$ ),  $0.53$  ( $p<0.001$ ), and  $0.03$  ( $p>0.30$ ), respectively. PPI-R SCI was correlated with NU, SS, and PU at  $r_s=0.58$ ,  $0.18$ , and  $0.61$  (all  $p_s<0.001$ ), respectively. PPI-R Coldheartedness was correlated with NU, SS, and PU at  $r_s=0.15$ ,  $0.13$ ,  $0.33$  (all  $p_s<0.001$ ), respectively. With regard to the Levenson scales, Primary Psychopathy was correlated with NU, SS, and PU at  $r_s=0.37$ ,  $0.10$ , and  $0.51$  (all  $p_s<0.001$ ), respectively. Lastly, Secondary Psychopathy was correlated with NU, SS, and PU at  $r_s=0.59$  ( $p<0.001$ ),  $0.04$  ( $p>0.20$ ), and  $0.54$  ( $p<0.001$ ), respectively. These findings suggest that FD is selectively related to SS. In contrast, the other dimensions of PPI-R-assessed psychopathy are positively related to both dimensions of urgency, although the relations of Coldheartedness to these two dimensions were more modest. Additional information regarding UPPS-P scales is available from the first author.

**Table 1** Bivariate correlations among psychopathic personality and DvC components

	PPI-R FD	PPI-R SCI	PPI-R CH	LSRP Prim	LSRP Sec	Low Persev	Low Premed	A
Psychopathic personality								
Psychopathic Personality Inventory-Revised (PPI-R)								
Fearless Dominance (FD)								
Self-Centered Impulsivity (SCI)	0.07							
Coldheartedness (CH)	0.15	0.30						
Levenson Self-Report Psychopathy Scales (LSRP)								
Primary (Prim)	0.13	0.63	0.53					
Secondary (Sec)	-0.11	0.70	0.20	0.57				
DvC								
Low Perseverance (Persev)	-0.20	0.60	0.21	0.42	0.62			
Low Premeditation (Premed)	0.10	0.56	0.18	0.40	0.55	0.67		
Agreeableness (A)	0.06	-0.58	-0.50	-0.61	-0.55	-0.48	-0.41	

DvC Disinhibition vs. Constraint

N=1160. All correlations significant at  $p < 0.01$

-35185.25,  $k=96$ ,  $BIC=70708.56$ ,  $DIC=35418.49$ ) indicating that although the measured factors were equivalent across groups, mean-level differences existed. Specifically, compared with Whites, Black/African-American participants scored 0.36 standard deviations higher on Fearless Dominance and 0.27 standard deviations lower on Coldheartedness. For the Levenson factors, however, the best fitting model was one in which *both* loadings and latent means were constrained to be equal between groups ( $X^2=3139.90$ ,  $\ln(L)=-24088.11$ ,  $k=106$ ,  $BIC=48549.49$ ,  $DIC=24345.64$ ) indicating no differences between racial groups on the structure of Levenson psychopathy and no mean-level group differences. Taken together, results of this series of CFA models confirm an invariant structure of psychopathy within both a PPI-R as well as a Levenson framework and confirm the appropriateness of subsequent group comparisons (see Appendix A for model fit indices).

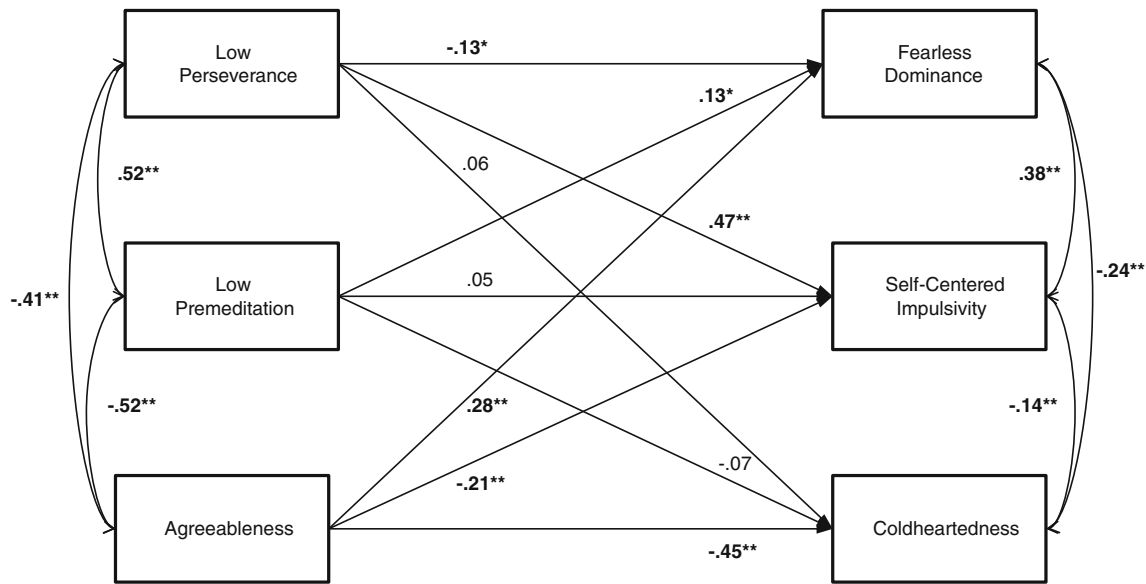
Path Analyses Predicting Dimensions of Psychopathy from Dimensions of DvC

To examine unique associations between aspects of a three-factor PPI-R model of psychopathy and components of DvC, Fearless Dominance, Self-Centered Impulsivity, and Coldheartedness were regressed on the three DvC components, along with age, gender, and race, in a single path analysis model. As shown in Fig. 2, low Perseverance (negatively) and low Premeditation and Agreeableness (positively) contributed uniquely to the prediction of Fearless Dominance, with Agreeableness evidencing the largest contribution. Furthermore, male gender and age were positively associated with Fearless Dominance; race was not significantly related. Low Perseverance positively and Agreeableness negatively predicted Self-

Centered Impulsivity, with low Perseverance evidencing the largest contribution. Age was negatively associated with Self-Centered Impulsivity, whereas males evidenced significantly higher levels of this trait compared with females. Race was not significantly related to Self-Centered Impulsivity. Lastly, only lower levels of Agreeableness contributed uniquely to the prediction of Coldheartedness; none of the other two DvC components evidenced a significant contribution. Age was positively associated with Coldheartedness and being male and Black/African-American were associated with higher levels on this factor.

Next, as described earlier, to examine whether associations between PPI-R psychopathy factors and DvC varied by race, multi-group analyses were conducted with a subset of participants that included the two largest racial groups, White and Black/African-American. Model fit indices revealed a better fit for the model in which regression weights were constrained to be equal across racial groups ( $BIC = 22329.23$ ,  $DIC = 11114.99$ ) than for the model in which regression weights were free to vary ( $BIC = 22386.73$ ,  $DIC = 11132.71$ ), indicating that associations between components of DvC and PPI-R psychopathy factors did not vary by race.

To examine unique associations between the two-factor Levenson model of psychopathy and components of DvC, Primary and Secondary Psychopathy were regressed on the three DvC components, along with age, gender, and race, in a single path analysis model. All indicators loaded significantly on their target factors. As shown in Fig. 3, lower levels of Agreeableness and low Perseverance were uniquely associated with Primary Psychopathy. Further, being male and Black/African-American emerged as significant unique predictors. With regard to Secondary Psychopathy, only low Perseverance emerged as a significant unique predictor; neither



**Fig. 2** Components of DvC predicting Fearless Dominance, Self-Centered Impulsivity, and Coldheartedness. Note.  $\chi^2=17.05$ ; AIC=42387.35; BIC=42629.80; RMSEA=0.04; SRMR=0.01; CFI=0.99;

TLI=0.97. Fit indices are from final model after trimming nonsignificant paths.  $*p<0.05$ ;  $**p<0.001$ . Model controls for age, gender, and race. All regression weights are standardized

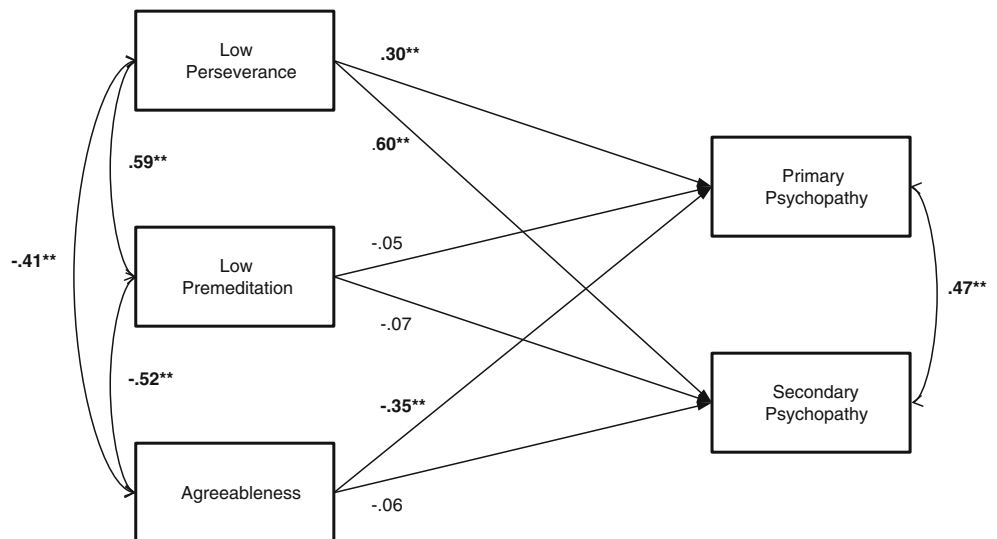
Agreeableness nor low Premeditation was uniquely associated with secondary psychopathy. Further, none of the demographic variables was associated with Secondary Psychopathy.

Consistent with PPI-R analyses, to examine whether associations between LSRP factors and DvC components varied by race, multi-group path analyses were run with specific subsets of participants. Model fit indices revealed a better fit for the model in which regression weights were freed to vary between racial groups (BIC = 13082.17, DIC = 6496.98) than for the model in which regression weights were constrained to be equal (BIC = 13036.49), indicating that, similar to PPI-R results, associations between components of DvC and LSRP factors did not vary by race.

**Discussion**

Although psychopathy has been broadly linked to individual differences in DvC, there is a limited understanding of shared versus unique patterns of associations between various sub-dimensions of psychopathy and DvC. This is due, in part, to the heterogeneous nature of psychopathy, a broad construct that is believed to subsume a number of lower-order components, with that number depending on the model examined (Skeem et al. 2011). Similar limitations exist with regard to the multidimensional DvC construct, which is often measured using diverse scales and inventories (Whiteside and Lynam 2001). To begin to address these limitations and in service of

**Fig. 3** Components of DvC predicting Primary and Secondary Psychopathy. Note.  $\chi^2=13.24$ ; AIC=22368.13; BIC=22509.56; RMSEA=0.03; SRMR=0.03; CFI=0.99; TLI=0.99. Fit indices are from final model after trimming nonsignificant paths.  $*p<0.05$ ;  $**p<0.001$ . Model controls for age, gender, and race. All regression weights are standardized





examining more than a single psychopathy model, we investigated two of the most commonly researched models, the three-factor PPI-R model and the two-factor Levenson Model. Further, we built on factor analytic work suggesting that DvC consists of three distinct components (Vaidya et al. 2010). The approach taken in the current study represents an important extension of previous research. Earlier investigations (e.g., Derefinko and Lynam 2006; Poy et al. 2014) have focused on bivariate correlations between facets of the NEO-PI-R (Costa and McCrae 1992) with aspects of psychopathy. This approach fails to model the shared variance between components of DvC and therefore may obscure unique associations between specific DvC dimensions and various aspects of psychopathy. The current study utilized path models and our a priori model of DvC to jointly model the shared variance between sub-dimensions of DvC and therefore provides a more thorough investigation into common as well as distinct associations between DvC components and aspects of psychopathy.

Our results suggest significant specificity in the associations between aspects of psychopathy and DvC. Additionally, although replication is necessary, our results suggest that although race-based mean-level differences emerged for PPI-R Fearless Dominance and Coldheartedness (compared with Whites, Black/African-American participants were higher on the former and lower on the latter), the latent structure of psychopathy did not vary by race, nor did associations between dimensions of psychopathy and DvC. These findings potentially suggest that the extent to which mean-level racial differences in psychopathy emerge may hinge on the nature of the traits assessed. Our findings raise the possibility that when more adaptive features are assessed, as is the case with PPI-R Fearless Dominance (Lilienfeld et al. 2012b), racial differences in psychopathy are more likely to emerge. It will be important for future studies to investigate the replicability of these findings as well as the extent to which these results generalize to self-report measures of psychopathy other than the PPI-R and to non-self-report indices of psychopathy, such as interview-based and observer-based measures.

#### Common Versus Specific Associations Between DvC and Psychopathy

Consistent with expectations, as well as previous research (e.g., Patrick et al. 2009), our results support the notion of psychopathy as a multidimensional construct with different facets explained by different DvC components. These results also are broadly consistent with recent conceptual models that imply that psychopathy, at least as assessed by the PPI-R, may be more of a configuration of two or more largely distinct attributes than a monolithic higher-order construct (Fowles and Dindo 2009; Lilienfeld et al. 2012a, b; but see Lynam and Miller 2012, for a competing view). Within the PPI-R framework, path analyses showed Fearless Dominance to be

strongly associated with low levels of Perseverance and high levels of Agreeableness, Self-Centered Impulsivity to be associated with low levels of Perseverance and Agreeableness, and Coldheartedness to be associated with only low levels of Agreeableness. Contrary to expectations, in the context of the path analyses, low Premeditation was associated only with Fearless Dominance and not with Self-Centered Impulsivity. As noted above, associations were invariant across racial groups.

The finding of Fearless Dominance to be marked by high levels of Perseverance and Agreeableness is consistent with previous assertions that Fearless Dominance is associated with at least some adaptive characteristics (Lilienfeld et al. 2012a, b; Sellbom and Phillips 2013). At the same time, this trait constellation may not be entirely benign. Indeed, Latzman and colleagues (2011) reported that traits related to high levels of Perseverance were associated with greater levels of reactive aggression, suggesting that high levels of Perseverance, although seemingly positive, may also be linked to potentially harmful behaviors. Such findings highlight the importance of a multi-component assessment of DvC as well as of psychopathy.

Similar to findings within the three-factor PPI-R framework, results of path analyses using the two-factor Levenson framework suggest both specificity and generality in associations between components of DvC and aspects of psychopathy. Low Perseverance was predictive of both Primary and Secondary Psychopathy whereas Agreeableness was uniquely negatively associated only with Primary Psychopathy. Contrary to expectations, although low Premeditation was significantly and moderately associated with both Primary and Secondary Psychopathy at the bivariate level, it did not emerge as a unique predictor of either dimension when considered simultaneously with the other DvC components. Taken together, evidence of both generality and specificity emerged with regard to associations between second-order DvC components and Levenson psychopathy.

Our findings offer several implications for the conceptualization and assessment of psychopathy. By elucidating how this broad construct relates to lower-order components of DvC, potential etiological processes associated with various phenotypic expressions of psychopathy may come to light. Indeed, the specificity found regarding relations between components of DvC and facets of psychopathy suggests the existence of differing pathways to alternative phenotypic expressions of psychopathy. Indeed, there is evidence that different dimensions of DvC map onto distinct neural systems (Whelan et al. 2012) with endophenotypic markers shown to be largely specific to each system potentially ultimately assisting in distinguishing among DvC components and clarifying their ties to various facets of psychopathy. For example, some DvC components (e.g., Premeditation) may be related primarily to inhibitive processes, whereas others (e.g., Perseverance) may be more related to proactive behavioral tendencies (Costa and McCrae 1998).

Additionally, PPI-R Fearless Dominance's apparent association with higher levels of both Perseverance and Agreeableness is consistent with conceptualizations of psychopathy as consisting of aspects associated with not only maladaptive, but also adaptive, characteristics. Indeed, Cleckley's (1941) original conceptualization of psychopathy is a condition marked by a "mask" of adaptive functioning, including superficial charm, affability, and low distress. Indeed, although all other components were negatively associated with Agreeableness, Fearless Dominance was not. As Cleckley (1941) wrote, "More often than not, the typical psychopath will seem particularly agreeable and make a distinctly positive impression when he is first encountered" (p. 339). The differential associations we observed for the PPI-R versus the Levenson scales accord with findings that the PPI-R, but not the Levenson scales, are substantially saturated with boldness content, which comprises physical and social fearlessness and a resilience in the face of stress (Sellbom and Phillips 2013). Hence, the PPI-R, especially its Fearless Dominance component, captures a substantially more adaptive "variant" of psychopathy than do the Levenson scales.

Nonetheless, the role of the Fearless Dominance construct within the broader nomological network of psychopathy remains controversial. As Fearless Dominance has generally been found to be either unrelated or negligibly related to antisocial acts and other externalizing behaviors, as well as at best only modestly correlated with Self-Centered Impulsivity and with total scores on interview-based measures of psychopathy, some have contended that, at most, it plays a secondary role in psychopathy (Lynam and Miller 2012). In contrast, as discussed earlier, others have noted that Fearless Dominance is associated with (a) classical clinical depictions of psychopathy that emphasize superficial charm, assertiveness, and low anxiety (e.g., Cleckley 1941), (b) total scores on several well-validated questionnaire measures of psychopathy, and (c) psychophysiological indicators of low fear sensitivity (e.g., weak electrodermal activity in anticipation of an aversive noise, weak fear-potentiated startle), which are traditionally viewed as central to the condition (Lilienfeld et al. 2012a, b). Nonetheless, although our findings do contribute to this ongoing discussion, they do not necessarily resolve the contentious question of whether Fearless Dominance is an inherent component of psychopathy or merely an associated feature or moderator of its behavioral expression (Lynam and Miller 2012).

### Limitations

Due to the cross-sectional, correlational nature of our data, causal conclusions are not possible, so future longitudinal work should examine prospectively the prediction of aspects of psychopathy from lower-order components of DvC. In addition, the use of an undergraduate sample probably resulted in a smaller range for both predictor and criterion variables compared with clinical

samples, thereby potentially attenuating the magnitude of associations among variables. Further, although sex was statistically covaried in all of our multivariate analyses, the use of a predominantly female sample may have limited the generalizability of our findings to males. Nonetheless, previous studies suggest that, despite mean-level differences between men and women, the external correlates of psychopathy are broadly similar across genders (Cale and Lilienfeld 2002; Miller et al. 2011). Moreover, the diverse nature of our sample (i.e., 37.6 % Black/African-American, 33.6 % White) relative to the majority of samples reported in the literature represents an advance over most literature in this area.

We used two widely-used self-report psychopathy instruments previously shown to capture two- and three-factor models of the psychopathy construct. Nevertheless, we did not administer psychopathy measures that use different methodologies (e.g., largely interview-based measures, such as the Psychopathy Checklist-Revised; Hare 1991, 2003). These measures may bear differential relations with DvC components. Additionally, although the UPPS framework appears to be potentially useful in examining aspects of the broad DvC dimension, the strong correlation between the two UPPS scales ( $r=0.67$  in the current study) as well as the lack of coverage of the Agreeableness component of DvC suggests the UPPS may not be sufficient to fully assess DvC-related content. Multiple inventories may therefore be needed to assess the full DvC dimension. Additionally, item-keying on the two UPPS scales included in the current study may present an additional concern. Specifically, all items on the (lack of) Premeditation and the vast majority of items on the (lack of) Perseverance scale are reverse keyed, potentially inducing an acquiescence or counter-acquiescence response set. Lastly, as our findings were based exclusively on self-report measures of psychopathy and DvC, the absolute levels of the associations may be inflated due to shared method variance. Nevertheless, shared method variance is unlikely to account for the differences in the relative associations among different components of psychopathy and DvC.

### Conclusions

Our results confirm the broad dimension of DvC as representing a general diathesis to psychopathy, with second-order components conferring more specific risks for particular presentations. These findings contribute to the ongoing discussion of how best to conceptualize the heterogeneous nature of the psychopathy construct. Further, the current findings suggest that associations between second-order DvC dimensions and self-reported dimensions of psychopathy do not vary by race, although further work will need to replicate these results in other samples. Overall, our findings point to both common and distinct associations between DvC and psychopathy, confirming the importance of focusing at the facet-level when

studying psychopathy as well as on lower-order components of DvC. Such examinations should further explicate differential DvC-related etiological mechanisms associated with various phenotypic expressions of the broad psychopathy construct.

**Conflict of Interest** All authors declare no conflicts of interest.

**Experiment Participants** The current study was conducted with the informed consent of all participants. This project was approved by the university Institutional Review Board.

## Appendix A

**Table 2** Fit Indices for Race-Related Measurement Invariance Models

Model	$\chi^2$	ln(L)	k	BIC	DIC
<b>PPI-R</b>					
Factor loadings and latent means differ	2709.30	−35172.74	112	70739.88	35444.85
<b>Factor loadings equal, latent means differ</b>	<b>2734.32</b>	<b>−35185.25</b>	<b>96</b>	<b>70708.56</b>	<b>35418.49</b>
Factor loadings and latent means equal	2759.22	−35197.70	93	70722.90	35423.65
<b>LSRP</b>					
Factor loadings and latent means differ	3060.84	−24048.58	134	48569.03	24374.14
Factor loadings equal, latent means differ	3134.40	−24085.36	108	48551.03	24347.75
<b>Factor loadings and latent means equal</b>	<b>3139.90</b>	<b>−24088.11</b>	<b>106</b>	<b>48549.49</b>	<b>24345.64</b>

*PPI-R* Psychopathic Personality Inventory-Revised, *LSRP* Levenson Self-Report Psychopathy Scales

Best fitting model highlighted in **boldface**. *ln(L)* log-likelihood. *k* number of parameters. *BIC* Sample Size Adjusted Bayesian Information Criterion. *DIC* Draper's Information Criterion

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