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The Role of Emotion Regulation in the Relations between Psychopathy Factors and Impulsive and Premeditated Aggression

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Abstract

Given the high rates of aggressive behavior among highly psychopathic individuals, much research has sought to clarify the nature of the relation between psychopathy and aggression. The present study examined relations between Fearless Dominance (PPI FD), Self-Centered Impulsivity (PPI SCI), and Coldheartedness (PPI CH) Factors of the Psychopathic Personality Inventory (PPI; Lilienfeld & Andrews, 1996) and aggression dimensions (premeditated and impulsive aggression) in a sample of substance users receiving inpatient treatment. At the univariate level, PPI FD traits were significantly and positively related to premeditated aggression, but were not significantly related to impulsive aggression. PPI SCI traits were positively related to both forms of aggression, whereas PPI CH was not significantly related to either aggression dimension. Emotion regulation difficulties, as measured by the Difficulties with Emotion Regulation Scale (DERS; Gratz & Roemer, 2004), were negatively related to PPI FD traits, positively related to PPI SCI traits, and negatively related to PPI CH traits. Both PPI SCI and PPI FD traits exerted significant indirect effects on impulsive aggression through the DERS. In contrast, the DERS did not mediate the relations between psychopathic traits and premeditated aggression. Results provide a more nuanced understanding of the psychopathy-aggression relations and suggest that difficulties with emotion regulation may be an important mediator of the relations between psychopathy factors and impulsive aggression.

Individuals with high levels of psychopathic traits often display chronic aggressive and violent behavior, including illegal acts (Porter & Woodworth, 2006). Institutional files and interviews with offenders in prison reveal that offenders with high levels of psychopathic traits are charged with violent crimes twice as often as non-psychopathic offenders (Hare & Jutai, 1983), and longitudinal research with adolescents has shown that psychopathy scores predict aggressive behavior (Stafford & Cornell, 2003; but see Skeem & Cooke, 2010, for a different perspective on the link between psychopathy and physical aggression). Given the high rates of aggressive behavior among highly psychopathic individuals, much research has sought to clarify the nature of the relation between psychopathy and aggression.

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Aggressive behavior is sometimes categorized as either premeditated or impulsive (Reidy, Shelley-Tremblay, & Lilienfeld, 2011)¹. *Premeditated aggression* is goal-driven and motivated by external rewards, whereas *impulsive aggression* occurs in the context of provocation and anger and is typically an immediate reaction in the absence of a clear secondary goal (Berkowitz, 1993). There is strong empirical support for a relation between psychopathy and premeditated aggression. For example, Woodworth and Porter (2002) found that 93.3% of homicides committed by psychopathic offenders were premeditated in nature, compared with 48.4% by non-psychopaths. In contrast, findings on the relation between psychopathy and impulsive aggression are mixed, with some studies finding that psychopathic individuals display more impulsive aggression than do other individuals, and some studies finding that they show less (Reidy et al., 2011).

To understand the factors differentially underlying different dimensions of aggression, one must consider the dimensionality of psychopathy. Psychopathy is characterized by a distinctive constellation of interpersonal traits, affective traits, and a pattern of impulsive and often antisocial behaviors. As noted by Cooke, Michie, and Hart (2006), “There is broad agreement that interpersonally, psychopathic individuals are dominant, forceful, arrogant, and deceptive; affectively, they lack appropriate emotional responses, with any emotional responses being limited and short-lived, behaviorally, they are impulsive and lack planfulness,” (p. 92). Factor analyses of the commonly used Psychopathic Personality Inventory (PPI; Lilienfeld & Andrews, 1996), a well-validated self-report measure of this condition, have typically revealed a three-factor structure (Benning, Patrick, Hick, Blonigen, & Krueger, 2003). The first PPI factor, sometimes called Fearless Dominance (PPI FD), assesses social and physical boldness, venturesomeness, and resilience in the face of stress. The second PPI dimension is often called Self-Centered Impulsivity (PPI SCI); it assesses a reckless and self-centered willingness to take advantage of and blame others. Factor analyses of the PPI (e.g., Benning et al., 2003) have often indicated that one of the eight subscales, Coldheartedness (PPI CH), which captures a callous lack of empathy, does not load substantially onto either factor.

The consideration of distinct psychopathy factors may be useful for understanding the relation between psychopathy and both premeditated and impulsive aggression. In a study that classified violent offenders as primarily proactive or impulsive, Cornell and colleagues (1996) found that premeditated violent offenders displayed higher levels of psychopathic traits than did impulsive violent or nonviolent offenders. They noted that, compared with other offenders, premeditated offenders were more superficial, manipulative, and more likely to lack feelings for others (corresponding to the interpersonal and affective features of psychopathy); however, premeditated offenders were also more irresponsible and impulsive (corresponding to the behavioral features of psychopathy). Expanding on this work, Cima and Raine (2009) found that total self-reported psychopathy scores were related to premeditated, but not impulsive, aggression in prison inmates. When analyzing the relation between specific factors of psychopathy and aggression dimensions, PPI SCI traits were

¹Throughout the literature, premeditated aggression also is called instrumental or proactive aggression, whereas impulsive aggression also is called reactive or affective aggression. For consistency, we use the premeditated and impulsive aggression terms throughout the manuscript.

significantly related to both types of aggression, whereas PPI FD traits were significantly related only to premeditated aggression. This pattern of results held for both raw and residualized (“pure” scores created to separate distinctive elements of each type of aggression) aggression scores. Thus, although psychopathy was characterized predominately by premeditated aggression, some components of psychopathy were also related to impulsive aggression. Overall, research supports a relation between global psychopathic traits and premeditated aggression; some research has revealed a link between interpersonal/affective traits and premeditated aggression and between behavioral traits and impulsive aggression.

Current study

The present study aimed to extend previous work regarding the different relations between higher-order psychopathy factors (specifically here: PPI FD, PPI SCI, and PPI CH) with premeditated and impulsive aggression in a sample of low income substance users receiving inpatient treatment. Consistent with conceptualizations of psychopathy and previous results (Cima & Raine, 2009), we hypothesized that PPI FD traits, which are linked to an adaptive absence of anxiety and to potentially functional risk taking, would be positively related to premeditated aggression, whereas PPI SCI traits, which are tied to poor impulse control and a propensity toward externalized negative affect, would be positively related to impulsive aggression. We also expected PPI CH traits, which are linked to affective detachment and lack of empathy, to be positively related to premeditated aggression. As an exploratory aim, we examined which other PPI subscales were related to premeditated and impulsive aggression.

In the current study, we also went beyond prior work in examining emotion regulation difficulties as a potential mediator of the psychopathy-aggression relations. Prior research has linked emotion dysregulation to aggression in adolescents and adults (Cohn, Jakupcak, Seibert, Hildebrandt, & Zeichner, 2010; Herts, McLaughlin, & Hatzenbuehler, 2012), and a recent review concluded that both under-regulation and over-regulation of emotion may predispose individuals to aggressive behavior (Robertson, Daffern, & Bucks, 2012). Thus, emotion regulation is important to consider as a risk factor for aggression. Additionally, although certain psychological constructs may be closely tied to one psychopathy factor (e.g., lack of fear and PPI FD, callousness and PPI CH, poor impulse control and PPI SCI), emotion regulation may relate to all psychopathy factors, but in different directions. Specifically, interpersonal and affective traits of psychopathy (with the PPI, PPI FD and PPI CH) are ostensibly related to higher levels of emotion regulation, encompassing a relative absence of emotional reactivity, whereas behavioral traits (with the PPI, PPI SCI) are ostensibly related to poor emotion regulation. Research has revealed a negative relation between behavioral features of psychopathy and other personality scales that assess impulse control (e.g., Multidimensional Personality Questionnaire’s [MPQ] Constraint scale; Tellegen & Waller, 2008) as well as a positive relation between behavioral features of psychopathy and externalizing disorders (e.g., Benning, Patrick, Blonigen, Hicks, & Iacono, 2005). Additionally, interpersonal and affective features of psychopathy are consistently related to diminished emotional responding and affective modulation (e.g., Verona, Bresin, & Patrick, 2013). Recent work with undergraduates found that PPI FD traits were negatively

associated with difficulties with emotion regulation, whereas PPI SCI traits were positively associated with difficulties with emotion regulation (Donahue, McClure, & Moon, 2014).

Given theory and research demonstrating that (a) dimensions of psychopathy relate to emotion regulation in opposite directions and that (b) both under-regulation and over-regulation of emotion are tied to greater aggression (Robertson, Daffern, & Bucks, 2012), difficulties with emotion regulation are important to examine as potential mediators of the relation between psychopathy factors and aggression dimensions. In the present study, we hypothesized that difficulties with emotion regulation would be negatively related to PPI FD and PPI CH traits and positively related to PPI SCI traits. We also expected difficulties with emotion regulation to be positively associated with impulsive aggression. Finally, when examining difficulties with emotion regulation as an explanatory variable, we hypothesized that psychopathy factors (PPI FD, PPI SCI, and PPI CH) would show indirect effects on aggression dimensions (impulsive, premeditated) through difficulties with emotion regulation. We did not expect direct effects in our final model.

A final way in which the current study extends previous work is to examine the relation between psychopathy and aggression in a different population, providing breadth to the settings in which psychopathy and aggression is studied. Both Cornell and colleagues (1996) and Cima and Raine (2009) used prison sample in their research. A considerable amount of research on psychopathy has been conducted in prison, college, and community populations, but considerably less has focused on substance abusing populations. The present study addresses this limitation by examining adult substance users in residential treatment.

Method

Participants

Participants were 81 (68 men; 13 women) adults between the ages of 19 and 65 in a residential substance use treatment facility. The average age was 42 years ($SD = 10.24$). The sample was composed of 85.2% African American participants, 7.4% Caucasian participants, and 4.9% of participants who identified their race as "Other." Seventy-three percent of the sample reported having a high school degree or higher, and 58% earned less than \$20,000 annually. Participants were recruited in their first week of treatment. All were required by the treatment center to undergo detoxification before beginning treatment, which limited the impact of acute drug or withdrawal effects.

Procedure

To establish Diagnostic and Statistical Manual of Mental Disorders, 4th Edition (*DSM-IV*) Axis-I and Axis-II diagnoses, trained graduate research assistants administered the Structured Clinical Interview for the DSM-IV-TR (SCID-IV-TR; First, Spitzer, Gibbon, & Williams, 2002) to all participants. Only individuals who reported current psychotic symptoms during the interview were excluded from participation. Participants also completed several self-report assessments. All participants received a \$25 grocery store gift card for their participation.

Measures

Demographic information—Participants provided information regarding their age, race, education, marital status, and income.

Psychopathic Personality Inventory (PPI)—The PPI (Lilienfeld & Andrews, 1996) is a 187-item, self-report measure designed to assess the primary personality traits of psychopathy, including those described by Cleckley (1941) in *The Mask of Sanity*. Total scores on the PPI are interpretable as a global index of psychopathy. The PPI also yields scores on eight factor-analytically derived subscales: Impulsive Nonconformity, Blame Externalization, Machiavellian Egocentricity, Carefree Nonplanfulness, Stress Immunity, Social Potency, Fearlessness, and Coldheartedness. Seven of the eight subscales load onto two higher-order factors (Fearless Dominance and Self-Centered Impulsivity), and Coldheartedness does not load substantially onto either factor (Benning, Patrick, Hicks, Blonigen, & Krueger, 2003; but see Neumann, Malterer, & Newman, 2008, for a competing factor structure). The Fearless Dominance factor is composed of scores on the Social Potency, Fearlessness, and Stress Immunity subscales, and the Self-Centered Impulsivity factor is composed of scores on the Impulsive Nonconformity, Blame Externalization, Machiavellian Egocentricity, and Carefree Nonplanfulness subscales. Coldheartedness was examined as a stand-alone dimension in the present study (see also Lilienfeld & Widows, 2005), as it does not load highly onto either higher-order factor. Internal consistency for PPI subscales in this sample ranged from $\alpha = .75$ to $\alpha = .87$.

Impulsive and Premeditated Aggression Scale (IPAS)—The IPAS (Stanford et al., 2003) is a 30-item questionnaire that asks individuals to report on their aggressive acts over the past six months. Responses are scored on a Likert-type scale, ranging from 0 (Strongly Disagree) to 5 (Strongly Agree). Twenty-four of these items load onto two subscales (Impulsive subscale, 10 items; Premeditated subscale, 14 items). Individual's responses were coded to obtain a dimensional score for each subscale. The IPAS has been used with many different populations, including those drawn from community adult samples (Stanford et al., 2003), adults in a forensic hospital (Kockler, Stanford, Meloy, Nelson, & Sanford, 2006), adolescents with conduct disorder (Mathias et al., 2007), and male and female substance dependent patients (Conner, Houston, Sworts, & Meldrum, 2007). Internal consistencies for the two subscales in this sample were high ($\alpha = .86-.87$).

Difficulties in Emotion Regulation Scale (DERS)—The DERS (Gratz & Roemer, 2004) is a 36-item, self-report questionnaire that assesses multiple aspects of emotion dysregulation. The DERS yields a total score that is composed of scores on six subscales: nonacceptance of emotional responses, lack of emotional awareness, impulse control difficulties, difficulties engaging in goal directed behavior, lack of emotional clarity, and limited access to emotion regulation strategies. The DERS has high test-retest reliability and high internal consistency (Gratz & Roemer, 2004). Sample DERS items include, “When I am upset, I lose control of my behaviors,” “I experience my emotions as overwhelming and out of control,” and “I am clear about my feelings.” We used total DERS scores as a measure of emotional dysregulation. Internal consistency for the DERS in our sample was high ($\alpha = .93$).

Results

Relations between Psychopathy Factors and Aggression

Bivariate correlations, means, and standard deviations for all study variables as well as for individual PPI subscales are presented in Table 1. As predicted, PPI FD traits were significantly and positively related to premeditated aggression, but were not significantly related to impulsive aggression. In addition, PPI SCI traits were positively related to both forms of aggression, whereas (contrary to prediction) PPI CH was not significantly related to either aggression dimension. DERS scores were significantly related to PPI FD, PPI SCI, and PPI CH traits, but in different directions. Specifically, PPI FD and PPI CH traits were negatively related to the DERS, whereas PPI SCI traits were positively related to the DERS. The DERS was positively related to impulsive aggression but was not significantly related to premeditated aggression.

Relations between PPI Subscales and Aggression

Correlations between the PPI subscales and both aggression dimensions are presented in Table 1. Three subscales (Fearlessness, Impulsive Nonconformity, and Machiavellian Egocentricity) were significantly positively related to both premeditated and impulsive aggression. Two subscales (Blame Externalization and Childlike Nonconformity) were significantly positively related to impulsive aggression but were not significantly related to premeditated aggression. Three subscales (Social Potency, Stress Immunity, and Coldheartedness) were not significantly correlated with either aggression dimension.

Indirect Effects of Psychopathy on Aggression

Next, we examined the indirect relations between psychopathy factors and aggression dimensions via the DERS by creating a path analysis model using *Mplus 6* (Muthén & Muthén, 1998–2010). We utilized a full information maximum likelihood estimation method to handle missing data, which provides less biased parameter estimates than do ad hoc procedures (such as listwise and pairwise deletion) and is more robust to non-normal data (Little & Rubin, 1987). Less than 5% of data were missing for key study variables.

We examined a model in which we tested the indirect path from psychopathy factors onto impulsive and premeditated aggression via the DERS (see Figure 1). The model was just identified, meaning that the number of equations was equal to the number of parameters estimated. Path estimates are included in Figure 1. PPI SCI traits were positively related to DERS scores, which in turn were significantly related to impulsive aggression. Nevertheless, when including the DERS and related factors in the model, the relation between PPI SCI traits and impulsive aggression became nonsignificant. Tests of the mediational paths suggest that PPI SCI traits exerted a significant indirect effect on impulsive aggression through emotion regulation (indirect effect = .191 SE = .084; [95% CI = .008 – .101]). Further, PPI FD traits also exerted a significant indirect effect on impulsive aggression through emotion regulation (indirect effect = $-.132$, SE = .057; [95% CI = $-.117$ – $-.010$]).^{2,3}

Discussion

The present study adds to research on aggression and psychopathy by supporting the distinct relations between psychopathy factors and aggression dimensions. We found that PPI FD traits were significantly related to premeditated aggression, whereas PPI SCI traits were related to both premeditated and impulsive aggression. Contrary to our hypotheses, PPI CH traits were not significantly related to either aggression dimension. At the subscale level, Stress Immunity and Social Potency were also not related to either aggression dimension. We also found that the PPI subscales of Fearlessness, Impulsive Nonconformity, and Machiavellian Egocentricity were positively related to both types of aggression, and that Blame Externalization and Childlike Nonconformity were positively related to impulsive aggression. Future research should seek to replicate these subscale analyses with larger samples and with prison or community samples.

Beyond clarifying connections between specific components of psychopathy and dimensions of aggression, the current study aimed to provide a more nuanced understanding of these connections by examining the potential role of emotion regulation difficulties as a mediating variable. Present results provide support for the hypothesis that the DERS relates to, and perhaps in part underlies, the two higher-order factors of psychopathy (PPI FD and PPI SCI), and relates to FD and SCI traits in opposite directions. In addition to highlighting the multifaceted nature of psychopathy, this finding supports the examination of emotion regulation as a potentially important variable in the relations between psychopathy factors and aggression dimensions.

In the path analysis, we found a significant indirect effect of PPI SCI traits on impulsive aggression via difficulties with emotion regulation. This finding suggests that those who exhibit high levels of PPI SCI traits may react aggressively to provocation as a consequence of difficulties with controlling their impulses when upset, angry, or overwhelmed. Further, PPI FD traits exerted both direct and indirect effects through difficulties with emotion regulation on impulsive aggression. Although PPI FD traits were not related to impulsive aggression at the univariate level, they exerted both direct and indirect effects on impulsive aggression in our final model. The direct effect of PPI FD traits on impulsive aggression was positive, while the indirect effect through the DERS was negative. This finding suggests that the indirect effects through the DERS may be protective of impulsive aggression and may explain why the net univariate effects are non-significant.

In contrast, we did not find evidence that the DERS accounted for the relation between psychopathic traits and premeditated aggression. In our model, PPI FD and PPI SCI traits

²The indirect effects of PPI FD (indirect effect = $-.13$, $p = .031$) and PPI SCI (indirect effect = $.17$, $p = .035$) on impulsive aggression through the DERS remained significant even after removing the Impulse Control Difficulties subscale from the DERS.

³Subsequent analyses were conducted controlling for the effects of negative emotionality, as measured by the Multidimensional Personality Questionnaire Negative Emotionality scale (Tellegen & Waller, 2008), on the DERS and aggression dimensions. The DERS and Negative Emotionality were significantly positively related ($r = .57$, $p = .00$). In this model, the p-value for the indirect effects of PPI FD on impulsive aggression changed from $p = .02$ to $p = .05$ (indirect effect = $-.10$) and the p-value for the indirect effects of PPI SCI on impulsive aggression change from $p = .02$ to $p = .08$ (indirect effect = $.11$). In future work with larger samples, it will be important to see whether the DERS has incremental validity above and beyond negative emotionality in explaining the link between psychopathy factors and aggression. Nevertheless, because negative emotionality is probably a major outcome of emotion dysregulation, these analyses are highly conservative statistically.

directly explained a significant amount of the variance in premeditated aggression, but this association was not due to indirect effects via the DERS. Thus, our findings leave unresolved the question of why psychopathic traits are associated with planned aggression. Further research should examine other variables, such as intact or superior executive functioning (Ishikawa, Raine, Lencz, Bihrlé, & Lacasse, 2001), that may better account for the link between psychopathic traits and premeditated aggression.

This study is marked by several limitations. First, we relied on self-report measures to assess psychopathy and aggressive behavior. Although self-report measures clearly possess at least some validity for detecting psychopathy (Lilienfeld & Fowler, 2006) and aggression (Stanford et al., 2003), the questionnaire measurement of psychopathy in particular is hardly without controversy (see for example, Miller & Lynam, 2012; Lilienfeld, Patrick, Benning, Berg, Selbom, & Edens, 2012). It should therefore be borne in mind that different results could emerge with a different measure of psychopathy, such as the Psychopathy Checklist-Revised (Hare, 2003). Future research should attempt to replicate and extend these results using different measures of psychopathy and behavioral measures of aggression.

Second, the cross-sectional design of this study precludes drawing conclusions concerning longitudinal processes. Consequently, future research should replicate these analyses using longitudinal data, which may assist in evaluating the plausibility of causal models. Although our analyses provide preliminary evidence that emotion regulation mediates the relation between Self-Centered Impulsivity traits of psychopathy and impulsive aggression, more informative tests of mediation require longitudinal datasets (Kraemer, Stice, Kazdin, Offord, & Kupfer, 2001). Hence, we cannot exclude the possibility that the observed deficits in emotional regulation were either (a) secondary to aggression or (b) byproducts of an unmeasured variable that contributes to both emotional dysregulation and aggression.

Despite these limitations, our results bear important implications for our understanding of psychopathy-aggression relations and perhaps the development of interventions. Understanding the pathways from psychopathic traits to aggression may allow for the development of interventions that take into account the relevant processes underlying these relations. Our results suggest that difficulties regulating emotion are risk factors in the relation between PPI SCI traits and impulsive aggression and that the lack of difficulties with emotion regulation related to PPI FD traits may be protective against impulsive aggression. Our findings raise the possibility that emotion regulation may be a promising target for future interventions, as improving emotion regulation might in turn reduce risk for impulsive aggression. This hypothesis is especially relevant in a sample of substance users, as difficulties with emotion regulation are also related to substance use and substance use-related consequences (e.g., Dvorak et al., 2014; Axelrod, Perepletchikova, Holtzman, & Sinha, 2011).

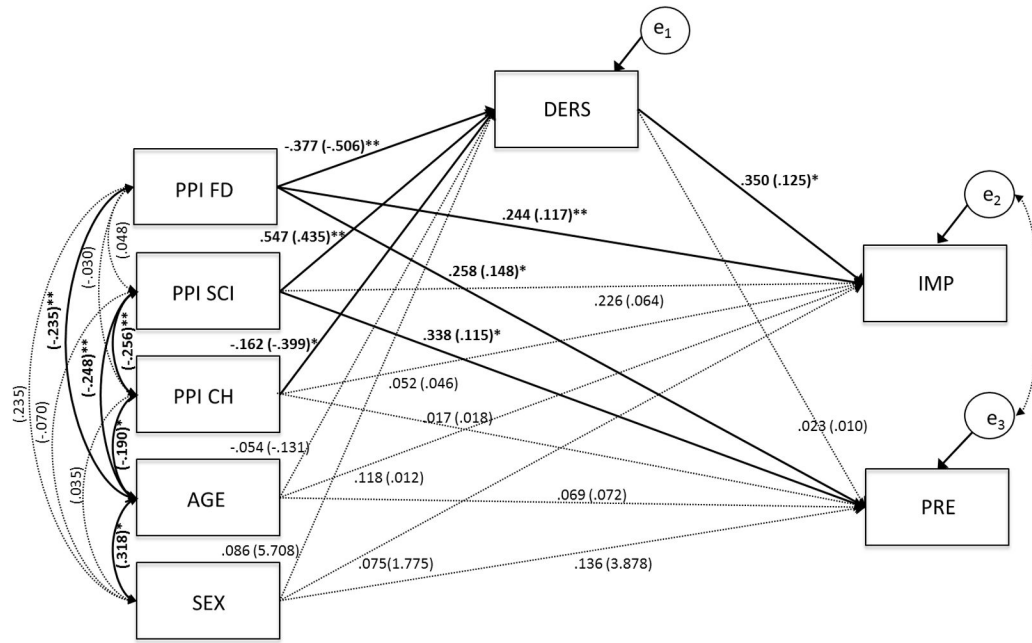
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* $p < .05$; ** $p < .01$.

Figure 1. Standardized and (unstandardized) path estimates for model

* $p < .05$; ** $p < .01$.

Note. PPI FD = Fearless Dominance Factor, PPI SCI = Self-Centered Impulsivity Factor, PPI CH= Coldheartedness Subscale, DERS = Difficulties with Emotion Regulation Scale, PRE = Premeditated Aggression Scale, IMP = Impulsive Aggression Scale.

Table 1

Correlations, Standard Deviations, and Means of Study Variables

Variables:	1.	2.	3.	4.	5.	6.	7.	8.	9.	10.	11.	12.	13.
1. PPIFD	--												
2. PPI SP	.845**	--											
3. PPI F	.750**	.378**	--										
4. PPI SI	.558**	.513**	.003	--									
5. PPI SCI	.019	-.126	.468**	-.600**	--								
6. PPI IN	.239*	.004	.640**	-.410**	.773**	--							
7. PPI BE	-.106	-.207	.299**	-.570**	.785**	.567**	--						
8. PPI CN	-.254*	-.321**	-.022	-.289**	.460**	.109	.123	--					
9. PPI ME	.121	.062	.426**	-.479**	.880**	.599**	.564**	.276*	--				
10. PPI CH	-.025	.090	-.286**	.304**	-.247*	-.380**	-.447**	.421**	-.219*	--			
11. DERS	-.308**	-.447**	.181	-.616**	.565**	.452**	.491**	.339**	.391**	-.302**	--		
12. PRE	.285*	.023	.331**	-.109	.343**	.323**	.129	.197	.344**	-.106	.114	--	
13. IMP	.133	.170	.402**	-.220	.397**	.286**	.245*	.236*	.380**	-.150	.378**	.753**	--
Mean	147.28	66.97	49.93	30.38	192.60	38.80	45.00	37.61	71.18	43.60	85.43	35.59	26.15
SD	19.31	8.99	11.07	6.12	31.56	9.01	10.72	8.32	14.04	9.98	24.79	10.67	8.89

* $p < .05$;

** $p < .01$.

Note. PPI FD = Fearless Dominance Factor, PPI SP = Social Potency Subscale, PPI F = Fearlessness Subscale, PPI SI = Stress Immunity Subscale, PPI SCI = Self-Centered Impulsivity Factor, PPI IN = Impulsive Nonconformity Subscale, PPI BE = Blame Externalization Subscale, PPI CN = Childlike Nonconformity Subscale, PPI ME = Machiavellian Egocentricity Scale, PPI CH = Coldheartedness Subscale, DERS = Difficulties with Emotion Regulation Scale, PRE = Premeditated Aggression Scale, IMP = Impulsive Aggression Scale.