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Sex differences on the four-facet model of psychopathy predict physical, verbal, and indirect aggression

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Abstract

Psychopathy is a multifaceted construct that has been linked to aggression. Yet, few studies have explored the association between physical, verbal, and indirect aggression using the 4-facet model of psychopathy in community samples, and to date, no studies exist that test for male and female differences. The present study aimed to understand what facets of psychopathy predict aggressive behavior for men and women, while controlling for important risk factors, such as Antisocial Personality Disorder (ASPD). Drawing from a large Bulgarian community sample (*N*=565), a confirmatory factor analysis supported the use of the 4-facet model of the Psychopathy Checklist: Screening Version (PCL:SV; Hart et al., 1995). Hierarchical linear regressions revealed that physical aggression was predicted by affective and antisocial psychopathic traits, and ASPD. Verbal aggression was predicted by the interpersonal facet, and indirect aggression was predicted by the antisocial psychopathy facet and ASPD. Sex significantly moderated the associations among facets of psychopathy and physical and indirect aggression. Specifically, the affective facet was positively associated with physical aggression only for women, whereas the antisocial facet was positively associated with indirect aggression only for men. Results suggest that the 4-facet model of psychopathy is sensitive to capture important similarities and differences between males and females when predicting forms of aggression in community samples. These findings underscore the importance of understanding how men and women differ in their risk-factors for aggressive behavior, which will better inform violence interventions based on sex-specific needs.

Keywords

Aggression has a major impact at the individual and societal level. At the individual level, physical aggression remains one of the leading causes of death in the United States, and at the societal level physical aggression is responsible for a major financial toll on community resources (Thomson, 2018). Generally, research has found that males are more likely to engage in physical aggression than females (Archer, 2004, 2009; Fagan & Lindsey, 2014). As a result, research exploring the risk factors for aggressive behavior have largely focused on male populations. Indeed, this focus on males was likely exacerbated by early research which suggested women were rarely aggressive, and aggression was a male phenomenon (Buss, 1961). However, this assumption was based on the quantitative occurrence of physical aggression, but not all aggressive behavior is physical and overt.

Prior research has classified aggressive behavior by the function (i.e., reactive or instrumental/proactive) and form of behavior. The form of behavior includes overt behaviors, such as physical (i.e., the physical harm to another person or property) and verbal aggression (i.e., verbal insults). Indirect aggression (also referred to as relational aggression; Archer & Coyne, 2005) is a more discreet form of causing harm to another person, such as social manipulation with the intention to cause psychological and social harm to the individual. This "behind-the-back" form of aggression is thought to be used to avoid direct confrontation when the costs of overt aggression are high (Archer & Coyne, 2005, p.212; Björkqvist, 1994). While men typically report higher levels of physical and verbal aggression, levels of indirect aggression seem to be similar between men and women (Czar, Dahlen, Bullock, & Nicholson, 2011; Schmeelk, Sylvers, & Lilienfeld, 2008), if not higher in women (Österman & Björkqvist, 2018). These more recent findings suggest that women are as aggressive as men, but the methods in which they aggress are different (Österman & Björkqvist, 2018).

There are two opposing theories that may explain these sex differences. *Social role theory* proposes that males are more likely to be aggressive because of social expectations for males to be more dominant and competitive, while women are shaped into noncompetitive and compliant roles within society (Wood & Eagly, 2012). Indeed, social role theory incorporates social learning theory, whereby a child's gender-typical behavior is enriched through the interaction and reinforcement from parents, teachers, peers, and the media (Archer, 2009; Bandura, 1973). Reformulation of the social role theory also suggested that the physical features (e.g., strength, size) of men and women also play a significant role in the sex-typical development of aggression (Wood & Eagly, 2012). Thus, because of the greater risk of physical injury associated with using physical aggression, women may resort to more concealed forms of aggression, such as indirect aggression. In contrast, *evolutionary models of sexual selection theory* propose that sex differences in aggression are largely due to males facing more competition for reproductive success than females (Archer, 2009). Greater competition for reproductive success results in males developing physical

and psychological characteristics which increase the success of achieving resources and mating (Buss & Duntley, 2006; Nivette, Sutherland, Eisner, & Murray, 2018). Therefore, both theories align in that physical aggression may have developed as a male-typical behavior through adaption/evolution to the environment, while for women the use of physical aggression is less favorable. Instead, women who engage in aggressive behavior may use less overt tactics to avoid physical harm and straying from social expectations. Thus, in theory, and based on the research conducted to date, there are notable differences in the occurrence and development of aggression in men and women. These primary sex differences in aggression underline the importance for research to begin exploring risk factors of aggression in men and women, especially because some women do engage in physical aggression. Based on these theories, it may be that women who engage in physical aggression display more male-typical characteristics, such as psychopathic traits, one of the most researched risk factors for aggression and violence. Although the prevalence of psychopathy in the community is low for men (1–2%) and even lower in women (0.3% –0.7%), these individuals are responsible for 20–40% of all violent crimes (Coid & Yang, 2011; Hare & Neumann, 2008; Patrick & Drislane, 2015). Further, psychopaths are found to be responsible for more sadistic and gratuitous violence when compared to non-psychopaths (Juodis, Starzomski, Porter, & Woodworth, 2014). There is no surprise, then, that most psychopaths (93%) are involved in the criminal justice system (Kiehl & Hoffman, 2011), making up 15–25% of the prison population (Blair, Mitchell, & Blair, 2005; Hare, 1996). As a result, psychopathy has been proposed to be one of the costliest psychiatric disorders, with estimates nearing $460 billion annually (Kiehl & Hoffman, 2011). Given the chronic levels of aggression and offending, financial strain on society, and severity of perpetration, psychopathy has become one of the most important constructs in the criminal justice system (Vaughn & DeLisi, 2008). While a substantial proportion of research has explored the link between psychopathy and aggression, few studies have explored sex differences. Thus, it remains unknown if psychopathy acts differently as a risk factor for women as it does for men, and if these associations change based on the aggression type (e.g., physical, verbal, and indirect). The aim of the present study is to test if psychopathy is differently related to physical, verbal, and indirect aggression for men and women.

Aggression and Psychopathy: Sex Differences

Psychopathy is a multifaceted disorder, consisting of personality and behavior traits. While cutoff scores categorize an individual as psychopathic (PCL-R >30; PCL:SV >18; Hare, 2003), there is greater support for the study of psychopathy as a dimensional and continuous construct (Hare, 2003; Neumann & Pardini, 2014). Traditional conceptions of psychopathy consisted of a 2-factor solution (Hare et al., 1990). Factor 1 captures the core personality features of psychopathy, which include callousness, lack of empathy and remorse, shallow affect, grandiosity, manipulativeness, and superficial charm. In contrast, Factor 2 integrates the measurement of behavioral and criminal tendencies, such as juvenile and adult delinquency, poor behavioral control, impulsivity, and boredom susceptibility.

Both factors have demonstrated the capability of predicting future aggressive behavior (Coid & Yang, 2011; Gray & Snowden, 2016), however, Factor 2 typically demonstrates a stronger association (Kennealy, Skeem, Walters, & Camp, 2010). Yet, studies involving

women have produced mixed findings. For instance, in a female prisoner sample, Factors 1 and 2 were found to be uncorrelated to staff ratings of verbal and physical aggression (Salekin, Rogers, & Sewell, 1997). Yet, indirect aggression has been found to be correlated with Factor 2 psychopathic traits and not Factor 1, and this association was not moderated by sex (Schmeelk et al., 2008). Comparing a matched sample of male and female forensic patients, de Vogel and de Ruiter (2005) found Factor 2 was the only correlate of violence for men, and neither factor predicted violence for women. In stark contrast, Gray and Snowden (2016) found that both Factors 1 and 2 prospectively predicted aggression and violence for men and women from the MacArthur study, which included civil psychiatric patients discharged from an acute psychiatric hospital. A possible explanation for the mixed findings may be that the samples used were from different settings (e.g., prisoners, forensic psychiatric patients, and civil psychiatric patients, respectively). Alternatively, it may be that the 2-factor model of psychopathy is less sensitive to consistently capture differences and similarities between men and women. For instance, Factor 1 consists of affective and interpersonal psychopathic traits, but only affective traits (and not interpersonal) seems to be a consistent predictor for physical aggression in women (Thomson, Towl, & Centifanti, 2016). Therefore, the inconsistent associations found in prior research may be because Factor 1 is confounded by opposing risk factors for female aggression.

Studies conducting exploratory factor analysis (EFA) and confirmatory factor analysis (CFA) have found that the 4-facet model of psychopathy holds a superior structure compared to the 2-factor model (Neumann, Hare, & Newman, 2007) in male and female offenders and psychiatric patients (Bolt, Hare, Vitale, & Newman, 2004; Hill, Neumann, & Rogers, 2004), as well as in a "mega-world" general population sample using the Self-Report Psychopathy scale (Neumann, Schmitt, Carter, Embley, & Hare, 2012). These facets are: Interpersonal (i.e., grandiosity, superficial charm, manipulative); Affective (i.e., lack of remorse, shallow affect, callous lack of empathy); Lifestyle (i.e., boredom susceptibility, impulsivity, lack of realistic long-term goals); and Antisocial (i.e., poor behavioral controls, juvenile and adult delinquency). Importantly, the 4-facet model has yielded significant differences between males and females.

From a sample of male Dutch forensic psychiatric inpatients, both the antisocial and lifestyle facets correlated with physical aggression (Zwets, Hornsveld, Neumann, Muris, & van Marle, 2015). Similarly, when comparing the predictive ability of the 4-facet model between Canadian Aboriginal and Non-Aboriginal male offenders, only the antisocial and lifestyle facets predicted violence (Olver, Neumann, Wong, & Hare, 2013). Further, in a sample of male personality disordered prisoners, only the antisocial facet was a predictor of prison violence (Chakhssi, Kersten, de Ruiter, & Bernstein, 2014). Using the same data as Gray and Snowden (2016), Vitacco and colleagues (2005) found the 4-facet model to fit the data well, and when predicting violence the affective and antisocial facets were moderately-strong predictors. Unfortunately, the authors did not assess the interaction between sex and psychopathy. Nonetheless, this finding highlights the sensitivity of the 4-facet model when predicting aggressive behavior. In contrast, the interpersonal and affective facets have not been found to predict physical fights for men (Hall, Benning, & Patrick, 2004). Thus, it appears that the personality facets (affective and interpersonal) are not consistent predictors of aggression in men, while the antisocial facet predicts aggression across various

contexts and populations. Drawing from the limited research on women, the affective facet seems to play a more important role in aggression. In a sample of female offenders, both the antisocial and affective facets were found to prospectively predict future prison violence and retrospectively predict previous violent crimes (Thomson, 2017; Thomson et al., 2016). Furthermore, in a sample of young women, the affective and antisocial facets were associated with goal-directed aggression, and only the lifestyle facet was associated with reactive aggression (Thomson, Kiehl, & Bjork, 2018). Unfortunately, these studies have not included males to provide a clear comparison, nor have they used clinical assessment of psychopathy. Thus, it remains unclear if there are sex differences in how facets of psychopathy relate to different forms of aggression.

There are only a few existing studies which aim to understand the association between psychopathy and forms of aggression beyond physical aggression, and even fewer have specifically focused on sex differences. Although it is thought that indirect aggression involves manipulative traits (e.g., interpersonal features of psychopathy), Schmeelk et al. (2008) found no association between affective and interpersonal psychopathic traits and indirect aggression. Instead, the authors found that antisocial and lifestyle psychopathic traits were related to indirect aggression, and this held after accounting for overt forms of aggression. In addition, these results were not moderated by sex. In contrast, there is evidence that suggests interpersonal psychopathic traits are linked to verbal aggression. While controlling for other psychopathy facets, the antisocial and interpersonal facets were found to predict verbal aggression in male soldiers (Anestis, Green, Arnau, & Anestis, 2017). Further, Colins et al. (2017) conducted a latent profile analyses using self-report psychopathy and found adults who scored highest on the interpersonal features and antisocial features of psychopathy also reported high levels of verbal aggression when compared to those who scored low on psychopathy. The authors found no sex differences. In contrast, in a sample of male psychiatric and personality disordered patients, verbal aggression was not associated with any of the psychopathy facets; however, this study was correlational and did not control for each psychopathy facet (Zwets et al., 2015). Thus, more consistently the interpersonal and antisocial psychopathic facets seem to be related to higher verbal aggression for both men and women.

An important consideration linking psychopathy with aggression is that the antisocial facet of psychopathy is the most consistent predictor of most types of aggression. However, there is little understanding of how this facet differs in predictive utility when compared to antisocial personality disorder (ASPD), which does not require the collection of time-extensive collateral information. ASPD is a disorder characterized as a "pattern of disregard for, and violation of, the rights of others" (APA, 2013, p.645). In order to receive a diagnosis of ASPD, the adult must meet at least three of the following criteria: Behavior problems since the age of 15, as evidenced by (i) unlawful behavior, (ii) deceitfulness, (iii) impulsivity, (iv) irritability and aggressiveness, (v) reckless and dangerous behavior (to self and others), (vi) irresponsibility, (vii) lack of remorse. It is clear from the items that antisocial psychopathic traits and ASPD share many similarities. Indeed, psychopathy and ASPD reportedly have high comorbidity rates. For example, in a forensic inpatient sample 65% of patients scoring high on the PCL-R also had an ASPD diagnosis (Ogloff, Campbell, & Shepherd, 2016); of note, only 5.5% of those with a diagnosis of ASPD

scored high on the PCL-R. Given that antisocial behavior constitutes roughly a quarter of PCL based measures, this significant overlap is unsurprising. Yet, a distinguishing feature is that people with ASPD are marked by heightened emotional dysregulation (e.g., frustration, anger), whereas psychopathy is marked by emotional hyporesponsivity. Thus, even though both disorders share overlap, which is mostly related to antisocial behavior, psychopathy and ASPD represent two ends of emotional responsivity spectrum, which are related to unique neurobiological differences and developmental origins (see Yildirim & Derksen, 2013). Nevertheless, studies testing associations between psychopathy and aggression often overlook the importance of ASPD in predictive models. Thus, the prior findings for the antisocial facet and aggression may be a result of the unaccounted overlap with ASPD.

The Present Study

There is a scarcity of studies testing differences in aggression between men and women, especially using the 4-facet (Interpersonal, Affective, Lifestyle, Antisocial) model of psychopathy. In the present study, three forms of aggression were included - physical, verbal, and indirect aggression. Prior research has shown a strong link between the antisocial facet and severe forms of aggression (e.g., physical) for both men and women, therefore, we expected the antisocial facet to predict physical aggression for men and women. Based on prior research in female prisoners, we expected affective traits would predict physical aggression for women but not men. The expectations for verbal aggression was largely driven by the scant available research, which did not find sex differences (see Colins et al., 2017). Thus, it was expected that verbal aggression would be predicted by the antisocial and interpersonal facet and this would not be sex-specific. In line with self-report research (see Schmeelk et al., 2008), the antisocial and lifestyle facets were expected to predict indirect aggression, with no significant sex differences.

Method

Participants and Data Collection

Data were collected as part of a larger ongoing study investigating impulsivity among substance dependent individuals in Bulgaria. The data was collected in two sessions on two separate days, which included a combination of clinical interviews, self-report surveys, and neurocognitive tasks. Testing was conducted by an experienced team of psychologists at the Bulgarian Addictions Institute, Sofia, Bulgaria. All participants provided informed consent. The study was approved by the Institutional Review Boards of Virginia Commonwealth University and the Medical University in Sofia on behalf of the Bulgarian Addictions Institute.

Participants were recruited via flyers placed at substance abuse clinics, therapeutic communities, nightclubs, bars, and cafes in Bulgaria, as well as through the study's web page and Facebook page. Participants were screened via telephone or in-person on their medical and substance use histories. The sample consisted of healthy controls with no history of substance abuse or dependence and individuals who had a past history of opiate or stimulant dependence as defined by DSM-IV-TR criteria (APA, 2000). The majority of the participants with a history of substance dependence were in protracted abstinence at the

time of testing (i.e., DSM-IV full sustained remission for more than one year) – on average 22 months. Abstinence from alcohol and drug use at the time of testing was verified by the Breathalyzer test and urine toxicology screen. All participants met the following inclusion criteria: IQ higher than 75; minimum of 8thgrade education; and being able to read and write in Bulgarian. Exclusion criteria included: a history of neurological illness; head injury with loss of consciousness for more than 30 minutes; history of psychotic disorders and/or use of antipsychotic medication. The study consisted of two 4-hour long sessions. The first session included assessment of substance dependence, externalizing psychopathology (e.g., psychopathy, ASPD) and intelligence. The second session included neurocognitive assessments and self-report of personality and psychopathology.

The sample included 385 male and 180 female Bulgarian adults between the ages of 18 and 45 with a mean age of 27.50 (SD=6.15), 88% of whom had achieved a high school diploma. Psychopathy and aggression have been found to change with age (Hare, 2003); thus, consistent with prior research (Thomson, 2017) participants were included in the study if they were between the ages of 18 and 45 years. Fifty-four percent met diagnostic criteria for substance dependence, 17% met the diagnostic criteria for ASPD, and 6.7% met the diagnostic cut-off for psychopathy (PCL:SV >18). Those who met the cut-off for psychopathy were mostly men (95%) and met the diagnostic criteria for substance dependence (95%) and ASPD (71%).

Psychopathy

The Psychopathy Checklist: Screening Version (PCL:SV; Hart et al., 1995) is a 12-item semi-structured interview based on the PCL-R, which has been adapted and validated cross-culturally (Douglas, Strand, Belfrage, Fransson, & Levander, 2005; Wilson, Abramowitz, Vasilev, Bozgunov, & Vassileva, 2014). Items are scored on a three-point scale (0 = absent; 1 = somewhat present; 2 = definitely present) and summed to provide total scores ranging from 0 to 24 points. An in-depth psychometric analysis of the Bulgarian version of the PCL:SV with a subset of the current Bulgarian sample was performed by Wilson et al. (2014), which revealed good fit and adequate internal consistency of the 4-facet model of psychopathy. Interrater reliability was good for Affective (ICC = 0.91), Interpersonal (ICC = 0.79), Lifestyle (ICC = 0.87) and Antisocial facets (ICC = 0.93). The PCL:SV was conducted by a trained team of researchers initially trained by JV, the author of the Bulgarian version of the PCL-R with its publisher Multi Health Systems, and by Robert Hare, the author of the PCL:SV.

Antisocial Personality Disorder and Substance Dependence

Lifetime substance dependence was assessed using the Substance Abuse Module of the SCID-I (First, Spitzer, Gibbon, & Williams, 1996). Raters assessed the presence of DSM-IV symptoms of alcohol, cannabis, opiate, and stimulant abuse and dependence using a three-point scale (0 = not present, 1 = subthreshold, 2 = present). A diagnosis of substance dependence was made if the participant displayed three or more of the substance dependence criteria within a 12month period. Symptoms of ASPD were assessed using the ASPD module of the SCID-II. SCIDII raters elicit specific examples of ASPD symptoms endorsed

by the examinee, and score each symptom on a 3-point scale (1 = absent; 2 = subthreshold; 3 = present). Assessments were conducted by experienced clinicians trained by JV and GV.

Aggression

The Aggression Questionnaire (AQ; Buss & Warren, 2000) measures the tendency to behave aggressively using five subscales: physical aggression, verbal aggression, indirect aggression, anger, and hostility. The anger and hostility subscales are risk factors for being aggressive and not direct measures of aggression. Therefore, only the physical, verbal, and indirect aggression subscales were used. The physical aggression subscale consists of eight items and measures the use of physical force when expressing aggression (e.g., "If somebody hits me, I hit back"). The verbal aggression subscale consists of five items that assess the tendency to engage in verbal arguments/insults ("When people annoy me, I may tell them what I think of them"). The indirect aggression subscale includes six items, measuring aggression while avoiding direct confrontation (e.g., "…spread gossip about people I don't like"). Although the AQ does not specifically discriminate between reactive and proactive aggression, the scale mostly measures reactive aggression. Consistent with prior research (see Gresham et al., 2016), the reliability of the scales in the present sample were adequate to good (α = .65-.82).

Data Analytic Plan

Statistical analyses were conducted using R (R Core Team, 2017). First, we tested the 2-factor and 4-facet models of the PCL:SV using CFA for the full sample and for men and women separately. To assess if psychopathy predicted aggression for men and women, a series of hierarchical linear regressions were conducted. All regression models followed the same structure: Step 1 included sex, age, Substance Dependence Disorder, Antisocial Personality Disorder, and the four PCL:SV facets; step 2 added the interaction terms between sex and the four PCL:SV facets. Significant interactions were probed using simple slopes analysis (Aiken & West, 1991).

Results

Confirmatory Factor Analysis on the PCL:SV

Using lavaan package (Rosseel, 2012), a CFA with maximum-likelihood estimation with robust standard errors was conducted to test that a 4-facet model would fit the data. A nonsignificant chi-square suggests a good fit; however, chi-square is greatly influenced by larger sample sizes. Instead, three standard indices of practical fit were used (TLI; Tucker & Lewis, 1973; CFI, Bentler, 1990; and RMSEA; Browne & Cudeck, 1993). A comparative fit index (CFI) and Tucker-Lewis Index (TLI) >.90 suggests an acceptable model fit (Bentler & Bonett, 1980) and TLI > .95 suggests a good model fit (Hu & Bentler, 1998). A root mean square error of approximation (RMSEA) < .08, suggests an acceptable fit; an RMSEA < .06 suggests a good fit (Browne & Cudeck, 1993). Table 1 provides the fit indices for the PCL:SV total score, 2-factor, and 4-facet models for the full sample, and males and females separately. For the full sample, the fit indices favored the 4-facet model, and the 4-facet model fit the data significantly better than the 2-factor model ($X^2_{\text{diff}}(5) = 15.52$, $p = .008$). Based on the indices of practical fit, when compared to the 2-factor model, the 4-facet

model was similar for males and better fitting for females. However, the nested 2-factor and 4-facet models did not differ in terms of goodness of fit for men ($X^2_{diff}(5) = 9.32$, $p = .097$) or women ($X^2_{diff}(5) = 8.29$, $p = .141$), but were both significantly better fit compared to total PCL:SV ($X^2_{diff}(6) = 38.06$, $p < .001$; $X^2_{diff}(6) = 14.15$, $p = .028$; respectively). For the female sample, the 4-facet model yielded a nonsignificant Chi-Square suggesting a good fit, and the indices of practical fit demonstrate the 4-facet model had a good fit ($\chi^2(df = 48) = 62.17$, $p = .08$; TLI = .94, CFI = .95, RMSEA = .041, 90% CI = .000–.063). In the male sample, the 4-facet model demonstrated an acceptable fit ($\chi^2(df = 48) = 147.01$, $p < .01$; TLI = .93, CFI = .95, RMSEA = .075, 90% CI = .062–.088). Figure 1 displays the factor loadings and correlations for the 4-facet model. Factor loadings in the female sample were above the minimum threshold of .30 on all items (Floyd & Widaman, 1995). In the male sample, Grandiosity and Superficial Charm displayed a low degree of explained variance. Overall, all facets were correlated with each other, with the strongest correlations between the lifestyle and antisocial facets.

Physical Aggression

Results of the hierarchical linear regressions are displayed in Table 2. When predicting physical aggression, step 1 included age, sex, substance dependence, ASPD, and each psychopathy facet ($F(8, 527) = 39.62$, $p < .001$). Being male ($p = .007$), younger ($p = .004$), and having higher levels of ASPD symptoms ($p = .025$), affective traits ($p = .039$), and antisocial traits ($p < .001$) predicted physical aggression. Step 2 added the interaction between the psychopathy facets and sex ($F(12, 523) = 27.29$, $p < .001$). The only interaction to reach significance was between the affective facet and sex ($p = .023$). Simple slopes analysis (see Figure 2a) revealed that high affective traits predicted physical aggression for women ($p = .004$), but not for men ($p = .295$).

Verbal Aggression

When predicting verbal aggression, step 1 was significant ($F(8, 527) = 6.85$, $p < .001$), with younger age ($p < .001$) and higher scores on the interpersonal facet ($p = .027$) predicting verbal aggression. The antisocial facet approached significance ($p = .085$). Step 2 was significant ($F(12, 523) = 4.75$, $p < .001$), yet, no significant interactions emerged.

Indirect Aggression

The regression predicting indirect aggression was significant at step 1 ($F(8, 527) = 12.71$, $p < .001$). Being female ($p = .004$), younger in age ($p = .001$), and higher ASPD ($p = .044$) and antisocial facet ($p = .002$) scores predicted indirect aggression. Step 2 was significant ($F(12, 523) = 9.08$, $p < .001$), and the antisocial facet by sex interaction was significant ($p = .045$). Simple slopes analysis (see Figure 2b) showed that high antisocial traits predicted indirect aggression for men ($p < .001$), but not for women ($p = .914$).

Discussion

Our findings indicate that in a community sample, psychopathy is a reliable predictor of physical, verbal, and indirect aggression, even while accounting for ASPD. Importantly, differences were found across the psychopathy facets, which underscores the sensitivity

of the 4-facet model and furthers the understanding of the unique associations between psychopathy and aggression. Specifically, physical aggression was predicted by the antisocial and affective facets of psychopathy, as well as by ASPD, after controlling for sex and other psychopathy facets. This extends the findings from a civil psychiatric population to community populations (Vitacco et al., 2005). This result also highlights that ASPD and the antisocial facet of psychopathy uniquely predict physical aggression, regardless of sex. Our findings also reveal that the association between the affective facet of psychopathy and physical aggression was *only* significant for women, thereby replicating in a community sample recent findings that women who are higher on the affective facet of psychopathy pose greater risk of future violence (Thomson et al., 2016), unlike research in men, among whom the affective facet is unrelated to physical aggression (Chakhssi et al., 2014; Hall et al., 2004; Olver et al., 2013).

Social role theory and sexual selection theory suggest that the use of physical aggression is less advantageous for women than it is for men because of the greater risk of physical injury and deviation from social expectations. The present findings support these theories of sex differences in aggression. In order for women to deviate from gender-based social norms and take the risk of physical injury to physically aggress is contingent on both personality (i.e. affective) and behavioral (i.e. antisocial) characteristics. In particular, like men, these women will have higher levels of antisocial behavior and boredom susceptibility, however, unlike men, these women will feel no remorse and not take responsibility for their actions and display a callous lack of empathy for others. Affective psychopathic traits have been linked to fearlessness and are associated with reduced amygdala activity to threat (Fanti, 2018 for review; Thomson, 2016), which may indicate that women with these traits are inherently fearless of physical injury, as well as less concerned with the social consequences of being deviant from social norms.

In line with research in girls (Björkqvist, 2018), our findings reveal that women had higher levels of indirect aggression than men. This finding supports both the social role theory and sexual selection theory, in that women use aggression that is less overt. Indirect aggression can be a discreet method of causing harm and used when the risk of overt aggression is high. Indeed, we found this association was not contingent on psychopathic traits. Drawing from prior research, psychopathy in women is a greater risk factor for more serious and overt forms of aggression (i.e., physical aggression, prison violence, interpersonal violence; Thomson et al., 2018, 2016) than it is for discreet and less risky forms of aggression (i.e., indirect aggression). Yet, when controlling for sex we found that antisocial psychopathic traits predicted indirect aggression, which is consistent with research with undergraduate samples (Warren & Clarbour, 2009). Extending Warren and Clarbour's (2009) findings, our results show that the association between the antisocial facet and indirect aggression was significant only for men. A potential explanation of this male-specific finding is that the antisocial facet is linked to aggressive behavior across a variety of contexts. Therefore, males with antisocial traits may also use indirect aggression as an additional strategy to achieve a goal in different contexts, such as the manipulation and coercion of others (Centifanti et al., 2015).

In the present study, verbal aggression was predicted by the interpersonal facet across sexes. Interestingly, this association has not been found in male forensic inpatients (see Zwets et al., 2015). Although this inconsistency could be due to population differences, it may be also due to differences in data analytic strategies (e.g., not accounting ASPD or the other psychopathy facets). In support of the current findings, Colins et al. (2017) showed that community adults who scored high on interpersonal psychopathic traits were more likely to engage in verbal aggression than adults with low levels of psychopathy, and this association was not sex-specific. Further, interpersonal traits were also found to be associated with verbal aggression in male soldiers (Anestis et al., 2017). Thus, our results showing a lack of sex differences between the interpersonal facet and verbal aggression are consistent with prior research. An explanation for this result may be that people who are grandiose, manipulative, and superficially charming use verbal aggression to intimidate others for their own gain (e.g., dominance), and to protect their egotistical view, regardless of sex.

It is notable that the antisocial facet of psychopathy was the most robust predictor of different forms of aggression. The antisocial facet includes current and prior levels of antisocial behavior, thus, the association with aggression is not surprising, given that past behavior is considered one of the best predictors of future behavior (Meehl, 1954). Even in the current study, which accounted for ASPD and the other facets of psychopathy, the antisocial facet remained a significant predictor of aggression, and this association was greater than the association found with ASPD. This is important because the two constructs are very similar. However, the difference is that the PCL:SV requires time-consuming collateral information to assess past and current antisocial behavior, which may justify why the construct is more robust at predicting aggression. As a general risk factor for aggression, the antisocial facet seems to be reliable for men and women, yet, it is not sensitive to discriminate risk for different forms of aggression. Instead, this sensitivity is more reliably attained by using the full construct of psychopathy.

A few limitations must be considered when interpreting these findings. First, we were unable to test the function of aggression (i.e., reactive and proactive), and if the function would influence the sex difference associations. Second, although we confirmed the 4-facet model of psychopathy in a large Bulgarian community sample, there were two items on the interpersonal facet which had poor factor loadings. Because this was particular to the male sample, if these factor loadings were to influence the results, we would expect to see sex differences in the association with verbal aggression, which we did not, in line with prior research (Anestis et al., 2017; Colins et al., 2017). However, it will be important to test if these associations would hold using other psychopathy assessments. Lastly, because we used a community sample we had a low base rate of psychopathy scores when compared to clinical and forensic samples, thus, replication of the present findings in specialist samples is needed. In summary, using the PCL:SV we found that the 4-facet model of psychopathy was important and sensitive enough to uncover important sex differences and similarities in understanding aggressive behavior. The present study also highlights the utility of psychopathy above and beyond ASPD when predicting different forms of aggression in men and women.

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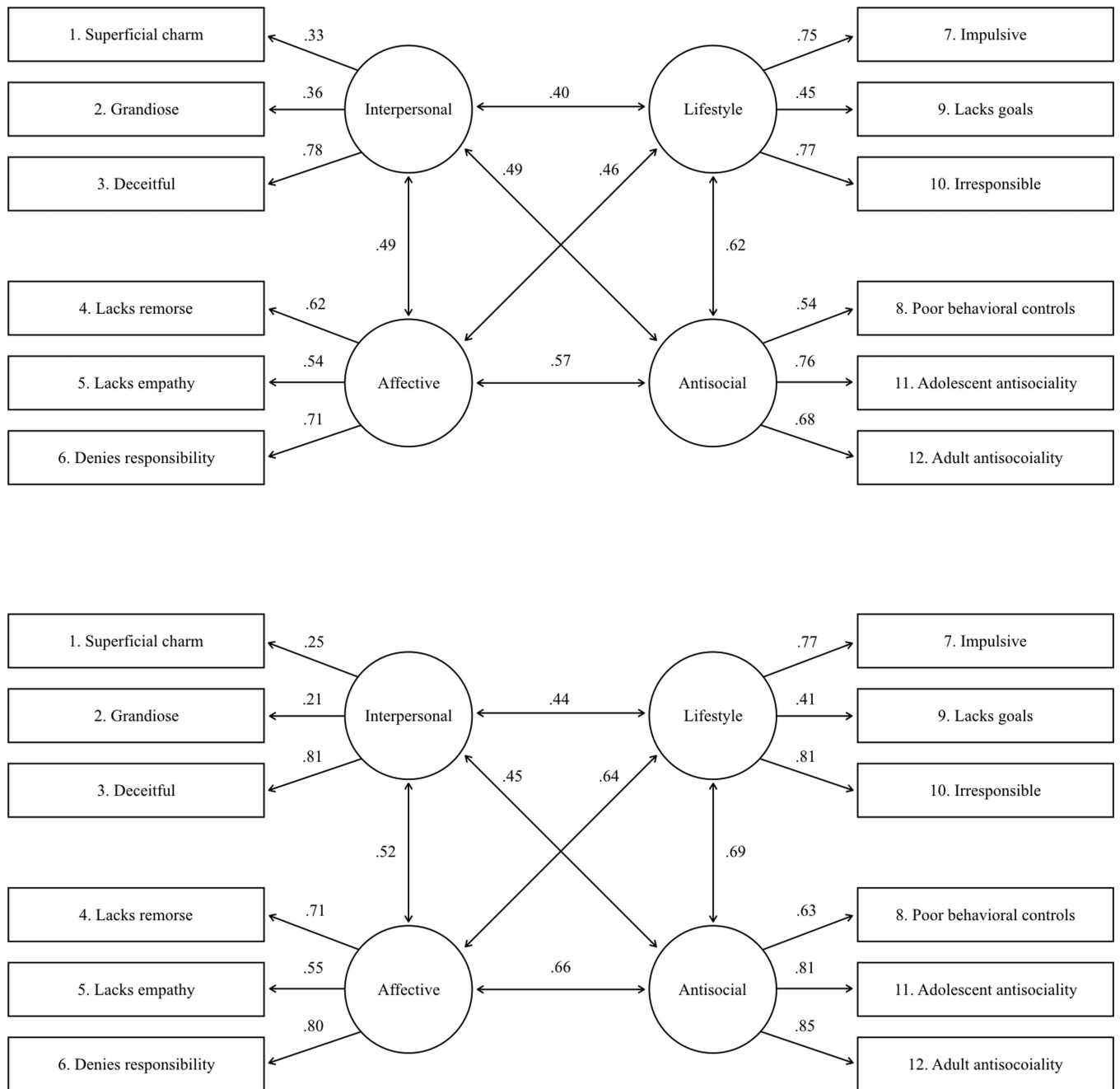
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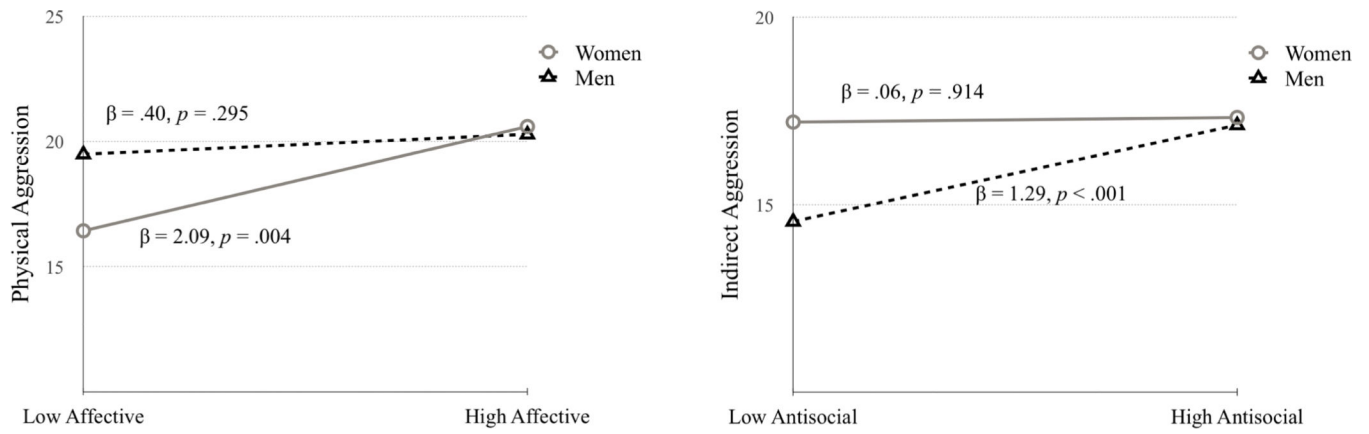
Figure 1.

Figure 1a. PCL:SV item factor loading and correlations among factors for female participants

Figure 1b. PCL:SV item factor loading and correlations among factors for male participants

Figure 2.

Figure 2a. The moderating effect of sex on the association between affective psychopathic traits and physical aggression.

Note. Low and high values represents +1.0 and – 1.0 *SD* from the mean.

Figure 2b. The moderating effect of sex on the association between antisocial psychopathic traits and indirect aggression.

Note. Low and high values represent + 1.0 and – 1.0 *SD* from the mean.

Table 1.

Model fit indices for the PCL:SV

	Full Sample (*N*=536)					Men (*n*= 368)					Women (*n*=172)				
	CFI	TLI	RMSEA	BIC	*p-value*	CFI	TLI	RMSEA	BIC	*p-value*	CFI	TLI	RMSEA	BIC	*p-value*
Total	.938	.923	.076	12004	<.001[a]	.934	.919	.082	8506	<.001[a]	.918	.900	.051	3179	.028[a]
2-Factor	.951	.939	.068	11961	<.001[b]	.949	.936	.073	8475	<.001[b]	.940	.926	.044	3168	.032[b]
4-Facet	.955	.938	.068	11956	.008[c]	.950	.932	.075	8477	.097[c]	.953	.935	.041	3163	141[c]

Note:

[a] Total vs. 4-Facet;

[b] 2-Factor vs. Total;

[c] 2-Factor vs. 4-Facet; CFI = Comparative Fit Index; TLI = Tucker-Lewis Index; RMSEA = root mean

squared error of approximation; BIC = Bayesian information criterion.

Table 2

. Hierarchical Linear Regression: Psychopathy and Sex as Predictors of (1) Physical Aggression, (2) Verbal Aggression, and (3) Indirect Aggression

	Physical Aggression				Verbal Aggression				Indirect Aggression			
	B	SE B	β	R^2	B	SE B	β	R^2	B	SE B	β	R^2
Step 1				.38***				.09***				.16***
Sex	-1.34	.50	-.10**		0.28	.34	.04		1.13	.39	.13**	
Age	-0.10	.04	-.10**		-0.10	.02	-.17***		-0.09	.03	-.13**	
Substance Dependence	-0.26	.61	-.02		0.20	.42	.03		-0.11	.47	-.01	
ASPD symptoms	0.47	.21	.15*		0.21	.15	.12		0.33	.17	.16*	
PCL:SV Interpersonal	0.26	.28	.04		0.48	.19	.14*		0.30	.22	.07	
PCL:SV Affective	0.69	.33	.11*		-0.09	.23	-.03		0.22	.26	.05	
PCL:SV Lifestyle	-0.39	.33	-.06		-0.27	.22	-.08		-0.24	.25	-.06	
PCL:SV Antisocial	2.38	.42	.39***		0.50	.29	.14*		1.03	.33	.25**	
Step 2				.01				.00				.01
Sex	-0.68	.56	-.05		0.51	.39	.07		1.43	.44	.16**	
Age	-0.10	.04	-.10**		-0.10	.03	-.17***		-0.10	.03	-.14**	
Substance Dependence	-0.29	.61	-.02		0.16	.43	.02		-0.05	.48	-.01	
ASPD symptoms	0.54	.21	.17*		0.23	.15	.13		0.33	.17	.16*	
PCL:SV Interpersonal	0.14	.31	.02		0.44	.21	.12*		0.14	.24	.03	
PCL:SV Affective	0.34	.37	.06		-0.08	.26	-.02		0.17	.29	.04	
PCL:SV Lifestyle	-0.40	.38	-.07		-0.40	.26	-.11		-0.44	.30	-.11	
PCL:SV Antisocial	2.52	.46	.41***		0.52	.32	.15		1.29	.36	.31***	
Sex *Interpersonal	0.48	.69	.04		0.17	.48	.02		0.84	.54	.10	
Sex *Affective	1.84	.80	.14*		0.16	.56	.02		0.40	.63	.04	
Sex *Lifestyle	0.13	.69	.01		0.46	.48	.07		0.71	.54	.09	
Sex *Antisocial	-0.94	.78	-.08		-0.13	.55	-.02		-1.23	.61	-.15*	

Note. Sex = Female (1), Male (0); SD = Substance dependence disorder (1=present); ASPD = Antisocial Personality Disorder symptoms.

*
  $p<.05$;

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** $p<.01$;

*** $p<.001$; † $p=.085$

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