



# Understanding the psychopathy-stress association in typical developing adults: The role of emotional deficits

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## ABSTRACT

This study assessed the relationships between psychopathic personality traits and perceived stress among 264 young adults. A hypothesized indirect effect of emotion and empathy deficits in the psychopathy-stress association was also investigated. Results indicated stronger associations between perceived stress with secondary psychopathy compared with primary psychopathy. Indirect effects of alexithymic traits on the relationship between stress and psychopathic personality traits were reported. Although the current study showed that both primary and secondary traits are significantly associated with higher levels of self-reported stress, it is the latter which seems to be most important, lending more weight to the need to consider mental health outcomes in those with high levels of secondary psychopathy characteristics.

## 1. Introduction

The common lay concept of psychopathy is one of coolness and control. However, the empirically-derived profile of psychopathic behavior includes indications of higher stress reactivity, irritability and anger (Cleckley, 1941/1976; Patrick, 2018). Such emotion-regulation difficulties may underpin the proactive and reactive types of aggression observed (Cima & Raine, 2009).

Emotional distress is both an antecedent and consequence of antisocial behaviour (Deschamps, Verhulst, de Castro, & Matthys, 2018; Garofalo, Neumann, & Velotti, 2018). High scores on psychopathy measures, along with elevated self-reported perceived stress, have been found to predict concomitant violence offending and victimization (Silver, Piquero, Jennings, Piquero, & Leiber, 2011). Although experimental evidence showing lower autonomic nervous system activation in stress reactivity and in stress recovery in psychopathic samples have been replicated (e.g., Beauchaine, Gatzke-Kopp, & Mead, 2007; Nederhof, Marceau, Shirtcliff, Hastings, & Oldehinkel, 2015; Sijtsema, Van Roon, Groot, & Riese, 2015), few studies have investigated the associations between psychopathy and perceptions of stress.

Before we examine what we already know about psychopathy and stress, it is important to consider work on primary and secondary variants of psychopathy. First proposed by Karpman (1941), these variants are typically defined by low anxiety/internalizing symptoms in the case of primary psychopathy, and increased anxiety and internalizing

symptoms (secondary variant), often seen alongside greater levels of traumatic experiences than those presenting with the primary subtype profile (Skeem et al., 2007; Tatar et al., 2012).

Cross-sectional work that has explored the associations of psychopathic personality traits to post-traumatic stress suggests that affective deficits seen in psychopathy could have some adaptive role in dealing with stress (Pham, 2012). For this reason, psychopathic personality traits of fearlessness and stress immunity seem to better characterize the primary psychopathy profile rather than the secondary subtype (Marcus, Fulton, & Edens, 2013). Similarly, traits denoting fearlessness have been negatively associated to personal distress, suggesting that among this group of individuals (likely primary-type) with higher psychopathic personality traits, there is an attenuated experience of distress (Durand, 2018).

One further study investigating the association between antisocial personality disorder (APSD; which includes those with elevated psychopathic traits) and perceived stress found that those with APSD had higher levels of self-reported stress when compared to participants with generic antisocial behavior and to those without antisocial traits (Goldstein, Dawson, Smith, & Grant, 2012). Previous work has shown that psychopathy and perceived stress are positive, significant predictors of concomitant violence offending and victimization (Silver et al., 2011). In addition, nearly 75% of incarcerated males who scored > 27 on the Psychopathy Checklist-Revised (PCL-R) reported a history of traumatic stressful events (Pham, 2012). In a further sample

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of psychiatric patients, Dalkner et al. (2018) employed the Psychopathic Personality Inventory-Revised (PPI-R; Lilienfeld & Widows, 2005) along with several measures of stress-related experiences, reporting that low self-reported stress levels and adaptive stress coping strategies might be explained by primary psychopathic personality traits in psychiatric settings. Recent data showed much stronger associations between secondary psychopathy and stress than between primary psychopathy and stress for both male and female participants (Eisenbarth et al., 2019).

One potential mechanism to explain increased stress responses is via impairments or differences in emotion processing. Stressful life events are certainly associated with differences in attention to and memory for emotional stimuli (Demers et al., 2018; Pollak, Cicchetti, & Klorman, 1998), and individual differences in stress responses are associated with different neural activity in areas of the brain involved in emotion processing (Henckens et al., 2015). Sethi et al. (2018) reported reduced neural responses to distress only in individuals with primary psychopathy. At present, it is not entirely clear whether emotional/social information processing deficits offer incremental utility in understanding stress in psychopathy (Crozier et al., 2008; Derefinko, 2015). Among these deficits in emotion processing, alexithymia is a strong candidate for further consideration. Defined as being an inability to describe or recognize one's own emotions, alexithymia has particular potential relevance to the study of psychopathy as both conditions entail deficiencies in empathic response (Bird & Viding, 2014; Takamatsu & Takai, 2019). Alexithymia has been negatively associated with empathic concern, one facet of affective empathy (Bird et al., 2010; Grynberg, Luminet, Corneille, Grezes, & Berthoz, 2010) and positively with psychopathy (Lander, Lutz-Zois, Rye, & Goodnight, 2012; Louth, Hare, & Linden, 1998).

Recently, Takamatsu and Takai (2019) reported that the three domains (difficulties in describing feelings [DDF], difficulties identifying feelings [DIF] and externally oriented thinking [EOT]) from the Toronto Alexithymia Scale (Bagby, Parker, & Taylor, 1994) correlated positively and with secondary psychopathy ( $r_{\text{range}} = 0.17$  to  $0.35$ ,  $p$ 's <  $0.01$ ), while the primary psychopathic variant was only associated with DIF and EOT ( $r_{\text{range}} = 0.26$  to  $0.30$ ,  $p$ 's <  $0.001$ ).

Higher scores on alexithymia measurements - especially those denoting deficits in identifying and describing feelings - have been positively linked to experiences of personal distress in adults (Grynberg, Luminet, Corneille, Grezes, & Berthoz, 2010). It is important to be able to consider the role of being able to adequately recognize and express one's own emotions in the management of stress, and the impact that these factors may have on antisocial behavior.

### 1.1. The current study

Psychopathy is not only linked to significant, direct harm to other individuals but also important societal costs (DeLisi, Reidy, Heirigs, Tostlebe, & Vaughn, 2018). Psychopathy is related with poorer outcomes for the individuals themselves, particularly those high on the affective component of the disorder, and is frequently associated with high rates of early stressful life experience (Dargis, Newman, & Koenigs, 2016; Dhingra, Boduszek, Palmer, & Shevlin, 2015). There is an emergent interest in studying the role that stress plays in behavior associated with psychopathy (Durand, 2018; Eisenbarth et al., 2019; Sethi et al., 2018).

The principal aim of the research was to explore the relationship between primary and secondary psychopathic personality traits and their associations with both alexithymic symptoms and with self-reported stress. Beyond the basic issue of the nature of bivariate relationships between psychopathy and stress, there are three key questions that we sought to investigate:

1. How do primary and secondary variants of psychopathic personality traits relate to alexithymia? Although previous research suggests a

relationship between psychopathic traits and alexithymic symptoms (Takamatsu & Takai, 2019), no other work has attempted to replicate whether this association is true for both primary and secondary variants of psychopathic personality traits.

2. Is there a difference in the way that primary and secondary variants of psychopathy relate to self-reported stress? Based on previous work that used psychophysiological and self-report measures, we aimed to test the hypothesis that perceived stress would positively associate with the secondary variant of psychopathic personality traits, but negatively with the primary variant.
3. What processes might mediate associations between stress and psychopathy? Arguably, various processes associated with psychopathy might contribute to higher levels of self-reported stress, but mediating mechanisms have been so far neglected in the research reviewed. Given that psychopathic personality traits can be comorbid with alexithymia, it was predicted that alexithymia would have significant indirect effects in the relationship between perceived stress and primary and secondary psychopathic personality traits. However, larger effects were expected to occur for the model exploring secondary psychopathic personality traits as a predictor of stress.

## 2. Method

### 2.1. Participants, procedures and design

This cross-sectional study involved a convenience sample of 264 adults between the ages of 18 and 58 years-old ( $M_{\text{age}} = 21.7$  years,  $SD = 6.92$ ; 70% female). In addition, 97.2% were currently enrolled in universities, 96.6% lived in the United Kingdom, 91.7% were under the age of 29 years-old, and 37% were employed or self-employed. The investigation was approved by the Goldsmiths College Research Ethics Committee and followed the international guidelines on research ethics, particularly the Declaration of Helsinki. G\*Power (version 3.1.9.2) was used to confirm that for all analyses the number of participants was enough for securing 95% of power and  $\alpha = 0.05$  (Faul, Erdfelder, Lang, & Buchner, 2007). Measures were presented after obtaining formal consent from participants, which were recruited on the basis of being aged 18 years-old or more and fluent in English. We recruited our participants in online forums and using platforms for research participation schemes. Prior to completing the measures, participants were informed about their rights as participants and asked to provide active consent. Course credits were granted as a form of acknowledgment for participation for those recruited at certain universities in the United Kingdom.

### 2.2. Materials

#### 2.2.1. Levenson Primary and Secondary Psychopathy Scales (LPSP; Levenson, Kiehl, & Fitzpatrick, 1995)

This 26-item questionnaire uses a four-point scale to assess different domains related to psychopathic personality in adults. For primary psychopathy, 16 items measure manipulative tendencies, lying behaviors, and lack of remorse, while 10 items of secondary psychopathy assess domains such as impulsive behavior, low tolerance and blame externalization. In the current study, Cronbach's alphas were adequate ( $\alpha = 0.86$  for the total scale,  $\alpha = 0.84$  for primary psychopathy, and  $\alpha = 0.70$  for secondary psychopathy). Moreover, results from confirmatory factor analysis (CFA) suggested a good fit for a 2-factor model (Supplementary Table 1).

#### 2.2.2. Toronto Alexithymia Scale (TAS-20; Bagby et al., 1994)

This is the most widely used measure of alexithymia and items are displayed in a five-point Likert scale ranging from "Strongly disagree" (1) to "Completely agree" (5). Normally, the TAS-20 is divided into a three-factor structure: DIF (seven items); DDF (five items), EOT (eight

items). Cronbach's alpha for the current study were  $\alpha = 0.80, 0.70, 0.80$  and  $0.63$  for the global scale, DIF, DDF, and EOT, respectively. CFA results indicated good fit for a 3-factor model (Supplementary Table 1).

2.2.3. *Perceived Stress Scale (PSS; Cohen, Kamarck, & Mermelstein, 1983)*

A 10-item measure, arranged on a five-point scale varying from never (0) to very often (4), that requires participants to rate the frequency in which they experienced stressful situations in the past month (Cohen et al., 1983). Research has shown high internal consistency and evidence of predictive and construct validity for the PSS in psychopathy research (Fite, Raine, Stouthamer-Loeber, Loeber, & Pardini, 2010; Loeber, Farrington, Stouthamer-Loeber, & Van Kammen, 1998). In this study the internal consistency was acceptable ( $\alpha = 0.86$ ). CFA results indicated good fit for a unidimensional model (Supplementary Table 1).

2.3. *Data analysis*

Missing data were assumed to be missing at random. To address to the first aim, this study will report on correlations (Pearson) between perceived stress with alexithymia and psychopathy. To account for possible effects of emotional deficits in explaining the links between self-reported stress and psychopathic traits, we used the PROCESS macro, which tests for indirect effects by calculating confidence intervals using bootstrapping procedures (10,000 samples; Hayes, 2013).

3. **Results**

In respect to the links between alexithymia and primary and secondary psychopathy personality traits, positive, small to moderate correlations were found for Externally Oriented Thinking, Difficulties Identifying Feelings and Difficulties Describing Feelings, although the magnitude of relationship was greater for the secondary psychopathy variant for the latter two dimensions of alexithymic symptoms and for alexithymia total score (Table 1). Even though both associations between primary/secondary variants of psychopathy and self-reported stress were positive and statistically significant, the association between perceived stress with secondary psychopathy was over twice the size of the correlation detected for primary psychopathy.

Subsequently, we tested several models examining to what extent

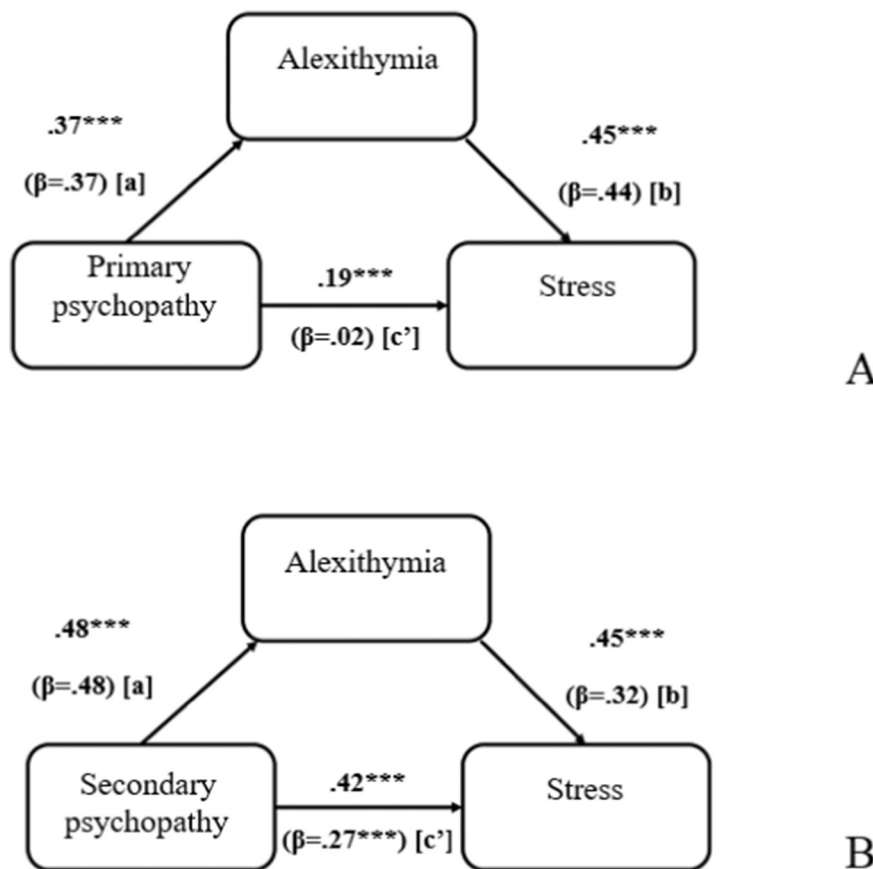
the perception of one's own emotional experiences (e.g., alexithymia) explains the relationship between psychopathic variants and stress, addressing the second research question above. Analyses of indirect effects in cross-sectional data require that the mediator variable (alexithymia) predicts the dependent variable (DV; perceived stress). Results were in line with this requirement ( $R^2_{Adjusted} = 0.19, \beta = 0.44, p < .001$ ). In addition, the independent variables (IV) should also predict the mediator. This assumption was confirmed for primary ( $R^2_{Adjusted} = 0.13, \beta = 0.37, p < .001$ ) and secondary psychopathy ( $R^2_{Adjusted} = 0.22, \beta = 0.47, p < .001$ ). Another requirement is that when IV's and the mediator are included together, the relationship between IV and the dependent variable (DV) declines and the variance explained increases (Jose, 2013). This condition was again supported for both models. Beta's value decreased to 0.02 and  $R^2_{Adjusted}$  increased to 0.19 in the primary psychopathy model (Sobel's  $z = 4.24, p = .002$ , with 0.85 indirect to total ratio effect size; the bootstrapped unstandardized indirect effect was significant and entirely above zero (0.15 [95% CI 0.08 to 0.24])). For secondary psychopathy, beta decreased to 0.27, and there was an increase in the variance explained ( $R^2_{Adjusted} = 0.25$ ), with 0.36 indirect to total ratio effect size (Sobel's  $z = 3.91, p = .009$ ); the bootstrapped unstandardized indirect effect was significant and entirely above zero (0.22 [95% CI 0.11 to 0.35])). Figure 1.

4. **Discussion**

The goal of the research was to test the hypothesis that psychopathic personality traits associate with behavioral, self-reported stress. In addition, the literature reviewed supported the investigation of further research questions. Firstly, we tested whether perceived stress was associated only with the secondary variant of psychopathy, or whether primary psychopathic traits were related to self-reported stress. Results showed that both psychopathic variants were positively correlated with self-reported stress, albeit stronger associations were detected between stress and secondary psychopathy (the magnitude of these correlations were statistically different; Diedenhofen & Musch, 2015). Findings related to the link between stress and secondary psychopathy were expected and might reflect the instable, impulsive, and anxious phenotype seen in secondary psychopathy (Derefinko, 2015; Karpman, 1941). However, recent data reported by Durand (2018) noted that “adaptive”

**Table 1**  
Correlations between dimensions of alexithymia, psychopathy and stress.

		1	2	3	4	5	6	7
1. Difficulties in identifying feelings	<i>r</i>	–						
2. Difficulties in describing feelings	<i>r</i>	0.53	–					
	<i>p</i> -Value	< 0.001	–					
	Upper 95% CI	0.62	–					
	Lower 95% CI	0.43	–					
3. Externally oriented thinking	<i>r</i>	0.10	0.35	–				
	<i>p</i> -Value	0.14	< 0.001	–				
	Upper 95% CI	0.24	0.46	–				
	Lower 95% CI	–0.04	0.22	–				
4. Alexithymia total	<i>r</i>	0.74	0.84	0.64	–			
	<i>p</i> -Value	< 0.001	< 0.001	< 0.001	–			
	Upper 95% CI	0.80	0.87	0.71	–			
	Lower 95% CI	0.67	0.79	0.55	–			
5. Primary psychopathy	<i>r</i>	0.16	0.25	0.46	0.37	–		
	<i>p</i> -Value	0.02	< 0.001	< 0.001	< 0.001	–		
	Upper 95% CI	0.29	0.37	0.56	0.48	–		
	Lower 95% CI	0.02	0.11	0.34	0.24	–		
6. Secondary psychopathy	<i>r</i>	0.36	0.43	0.30	0.48	0.54	–	
	<i>p</i> -Value	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001	–	
	Upper 95% CI	0.47	0.54	0.42	0.58	0.63	–	
	Lower 95% CI	0.23	0.31	0.17	0.36	0.43	–	
7. Stress	<i>r</i>	0.54	0.38	0.05	0.45	0.19	0.42	–
	<i>p</i> -Value	< 0.001	< 0.001	0.48	< 0.001	0.01	< 0.001	–
	Upper 95% C	0.63	0.49	0.19	0.55	0.32	0.53	–
	Lower 95% CI	0.44	0.25	–0.09	0.33	0.05	0.30	–



psychopathic traits, such as fearlessness and leadership were negatively linked to perceived stress. Dalkner et al. (2018) explored the cross-sectional associations between behavioral measurements of stress with psychopathic tendencies in psychiatric individuals, reporting that those with higher primary traits (e.g., Fearlessness Dominance) had lower levels of stress when compared to those with high secondary traits. Consequently, the weaker association between primary psychopathy and stress reported in our study deserves further consideration.

We also tested whether alexithymia would explain the relationship between perceived stress and psychopathic personality traits. We found that 85% and 36% of the total effect of primary and secondary psychopathy on perceived stress go through difficulties in the perceptions of one's own emotional experiences, respectively. The indirect effects of alexithymia on the relationships between stress and psychopathic variants are in line with emotional deficits seen in individuals high in psychopathic traits (especially empathic deficits; Takamatsu & Takai, 2019). Moreover, primary and secondary psychopathy are believed to have distinct etiologies, which could explain differential associations to behavioral stress and alexithymic traits (Blonigen, Hicks, Krueger, Patrick, & Iacono, 2005; Cairncross, Veselka, Schermer, & Vernon, 2013; Lander et al., 2012).

There are a number of potential implications from this work. Strategies aiming to attenuate the negative consequences of both stress and psychopathy could target these specific deficits in identifying and describing feelings, as well as promoting some level of emotional attachment training (Herpertz & Sass, 2000). This study could also have legal implications as individuals high on perceived stress are more likely to perform violent offending (Silver et al., 2011). Moreover, an enhanced perception of stress in those with elevated psychopathic personality traits could interact with a proneness to seek medical services; here, it might be interesting to follow the hypothesis that those seeking specialized attention could do so driven by self-seeking, untruthful motives (Cleckley, 1941/1976).

Strategies might also be designed differently for those possessing with dominant traits in one or the other variant of psychopathy investigated. Preventive research might particularly benefit from screening for these deficiencies during early stages of human development, which has shown to result in better outcomes when compared to strategies implemented later in life (Ribeiro da Silva, Rijo, & Salekin, 2015).

Several limitations to this study should be addressed. For instance, the use of self-report measures could have bias in terms of social desirability and impression management, resulting into less accuracy in responses in comparison to those obtained via structured interviews for psychopathy, collateral and interpersonal measures, in which at least two different points of view are contrasted in order to get a clearer assessment of the individual (Hare & Neumann, 2006). In general population samples, this is usually not plausible to achieve for large numbers, and is a better methodology for those who have had significant contact with justice and other services. Moreover, a relatively low alpha (0.63) was calculated for the EOT subscale. Thus, participants might have encountered difficulties in understanding the items comprised for this subscale (Iacobucci & Duhachek, 2003). Additionally, data presented here included an uneven proportion of male and female participants and were collected at one time point only, so it was not possible here to explore potential casual relationships. This should be an avenue for future investigation, the interpretation of findings from mediation analyses should be considered in the light of the possibility that alternative models might occur in cross-sectional research. Psychopathic variants - along with the TAS-20 subscales and the PSS scale - might likewise be included as mediator variables (Judd & Sadler, 2008; Roe, 2012). Several methods have been proposed to support the decision of selecting the most appropriate model for these analyses, including reverse mediation (Lemmer & Gollwitzer, 2017), theoretical examination, temporality, and experimental control (Wiedermann & von Eye, 2015). One suggested method includes a

series of examinations as to whether a predictor does exist before the values of the mediator(s), followed by an examination if the values of the mediator(s) would occur before the values of the dependent variable (Tate, 2015). Other supported methods test the indirect effect of the independent variable on the dependent variable via the mediator against zero (Hayes, 2013). In this respect, resampling methods - including the bias-corrected bootstrap - are more robust when compared to other methods, such as the Sobel's test (Lemmer & Gollwitzer, 2017).

Further research on behavioral processes associated with perceived stress in psychopathy could obtain clearer insights by adopting robust research designs. Among these, the use of longitudinal procedures certainly is desirable once it facilitates the establishment of casual links. The inclusion of a diversified range of participants, from diverse cultural backgrounds, could add value to the study of behavioral stress and its links with psychopathic personality traits (Dalkner et al., 2018).

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## Declarations of interest

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