



Psychopathy and indirect aggression: The roles of cortisol, sex, and type of psychopathy

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ABSTRACT

Salivary cortisol was examined in relation to indirect aggression and primary psychopathy (i.e., cold affect and interpersonal manipulation) and secondary psychopathy (i.e., criminal tendencies and erratic lifestyle) in a sample of 154 undergraduate students. Results revealed that although psychopathy and indirect aggression were strongly correlated, when statistically controlling for each of type of psychopathy, only primary psychopathy was related to indirect aggression. In women but not in men, lower cortisol was associated with higher levels of primary psychopathy and higher cortisol was associated with higher levels of secondary psychopathy. Cortisol was not related to indirect aggression. Results are discussed from both an evolutionary and developmental perspective.

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1. Introduction

Indirect aggression, also termed relational aggression and social aggression (see Archer & Coyne, 2005), refers to causing harm to someone in a covert fashion often through subtle non-verbal behavior and/or manipulation of social situations (Archer, 2001; Bjorkqvist, Lagerspetz, & Kaukianen, 1992; Crick & Grotpeter, 1995; Galen & Underwood, 1997). Indirect aggression is a widespread phenomenon used equally by adult men and women (Archer 2004) that is both psychologically and emotionally damaging to victims (e.g., Bjorkqvist, 1994; Werner & Crick, 1999). Vaillancourt (2005) argued that indirect aggression is an adaptive behavioral strategy to access finite resources such as mates and social status (see Campbell, 1995; Hawley, 2002). Reaping the benefits in social groups requires a certain level of interpersonal competency. Not surprisingly, researchers have linked more frequent indirect aggression use to enhanced social intelligence (Kaukiainen et al., 1999), leadership skills (e.g., Vaillancourt, Hymel, & McDougall, 2003), and greater popularity and power among peers (e.g., Vaillancourt & Hymel, 2006). These Machiavellian-type correlates are consistent with the clinical and sub-clinical personality types of psychopathy (McHoskey, Worzel, & Szyarto, 1998) which has recently been linked to the use of indirect aggression (Coyne & Thomas, 2008; Czar, Dahlen, Bullock, & Nicholson, 2011; Kerig & Stellwagon, 2010; Marsee, Silverthorn, & Frick,

2005; Miller & Lynam, 2003; Schmeelk, Sylvers, & Lilienfeld, 2008; Warren & Clabour, 2009).

Psychopathy is a multi-faceted personality construct that incorporates a wide array of unique behavior, affective states, interpersonal styles and attitudes (e.g., Cleckley, 1941; Hare, 1980). This constellation of behavior and attitudes can be sub-categorized into behavioral, affective, and interpersonal components. These include, but are not limited to, stable displays of behavioral misconduct, risk-taking, manipulativeness, and emotional coldness that profile a certain type of character within the population at large. In high functioning, non-clinical samples (e.g., university students, business leaders), psychopathy is expressed in a more subtle way that includes indirect forms of aggression such as social manipulation (Schmeelk et al., 2008).

Psychopathy is subdivided into two distinct facets: primary and secondary (Blackburn, 1975; Cleckley, 1941; Hare, 1991; Karpman, 1941; Lishner, Swim, Hong, & Vitacco, 2011; Lykken, 1995; Mealey, 1995). Primary psychopathy is suggested to be an inherent interpersonal-affective facet marked by an absence of fear, lowered levels of empathy, and lowered levels of anxiety. Secondary psychopathy is suggested to be a lifestyle-antisocial facet that includes impulsivity, higher levels of anxiety, and greater empathy due to extrinsic factors such as situational and/or affective turmoil. In addition to these cognitive and behavioral markers, primary and secondary psychopathy can be differentiated on the basis of physiology. For example, primary psychopaths are characterized as having lowered physiological reactivity in comparison to their secondary psychopathic counterparts (see Mealey (1995), for a review). Cortisol, a hormone associated with stress, is a marker of physiological reactivity and functioning of the

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hypothalamic–pituitary–adrenal (HPA) axis (e.g., Brown et al., 1996; Henry, 1992). Hyper-secretion of cortisol has been correlated with negative affect such as anxiety and depression (e.g., King, Blair, Mitchell, Dolan, & Burgess, 2006), whereas hypo-secretion of cortisol has been correlated with aggressive displays and other forms of misconduct (e.g., Raine, 1993; Van Goozen, Fairchild, Snoek, & Harold, 2007) that reflect psychopathic personality traits.

Given the heterogeneity amongst people exhibiting psychopathic personality traits, we hypothesized that cortisol secretion should serve as a physiological marker that aids in distinguishing individuals who show low fear and low anxiety (primary psychopaths) in comparison to those with higher fear and higher anxiety (secondary psychopaths). Popma et al. (2007) provided evidence to support lowered reactivity in the HPA axis in a sample of adolescent boys who displayed antisocial behavior. This inverse relationship between cortisol levels and psychopathic personality traits has also been found in adult samples of males charged with serious violent crimes (Holi, Auvinen-Lintunen, Lindberg, Tanni, & Virkkunen, 2006). In a study comparing two groups of male inmates (i.e., psychopathic and non-psychopathic) to a control group (i.e., non-inmates), Cima, Smeets, and Jelicic (2008) reported that among inmates, psychopaths had the lowest diurnal concentration of cortisol whereas non-psychopaths had the highest. The controls' cortisol levels fell in between those of the two groups of inmates. In their study conducted on a non-referred sample of adolescents, Loney, Butler, Lima, Counts, and Eckel (2006) found that low emotional activity, as measured by baseline cortisol levels, was associated with callous-unemotional traits, suggesting lowered cortisol levels may be a biological marker for primary psychopathy in males. In a follow-up study by O'Leary, Loney, and Eckel (2007), cortisol levels from male and female undergraduate students were measured before and after a stress test. The results showed that male (not female) participants scoring higher on the primary psychopathy questionnaire had lowered stress reactivity, as indexed by pre- and post-test cortisol measures, in comparison to males with low scores on the psychopathy questionnaire, suggesting that low cortisol production may be a male-specific marker for primary psychopathic personality (see also Loney et al., 2006).

As mentioned at the outset, it seems that both psychopathic personality traits and indirect aggression share certain commonalities that allow the individual to effectively navigate through their social world and secure positions of power through the use of 'cut-throat' behavioral strategies (e.g., derogating a rival behind their back to the employer for a job promotion). Psychopathy and the use of indirect aggression involve an element of refined social skills. Some have argued that the psychopathic personality is functional to getting ahead thereby allowing the individual to ascend the social ladder at a far more rapid rate (e.g., Babiak & Hare, 2007; Hare, 1999; Oakley, 2008). This ascension is evidenced by the over representation of people (typically men) with psychopathic personality traits in upper echelons of the occupational work force such as high profile criminal lawyers, CEOs of larger corporations, and nefarious political figures (see Babiak & Hare, 2007; Hare, 1999; Oakley, 2008). Indirect aggression has also been linked to higher social status (Vaillancourt & Hymel 2006; Vaillancourt et al., 2003) and lowered levels of empathy (Kirschbaum, Kudielka, Gaab, Schommer, & Hellhammer, 1999), a trait that is also linked to primary psychopathy.

The parallels between indirect aggression and psychopathy suggest that there might be a degree of overlap between these two constructs in the mechanisms involved in eliciting this aggressive behavior. One mechanism that may help explain the relationship between indirect aggression and psychopathy is physiological reactivity as indexed by the level of cortisol secretion. In this study, we examined the associations between indirect aggression,

psychopathy, and cortisol levels in a sample of university students. Consistent with other published studies (e.g., Czar et al., 2011; Kerig & Stellwagon, 2010; Marsee et al., 2005; Miller & Lynam, 2003; Schmeelk et al., 2008; Warren & Clabour, 2009), we hypothesized that a positive relation between indirect aggression and psychopathy (total score) would be found. Furthermore, because acts of indirect aggression are generally premeditated, strategic, and require mastery of necessary social skills to achieve one's goals within a group, we expected that consistent with Coyne and Thomas (2008), interpersonal manipulation and callous affect (primary psychopathy) would be more strongly correlated to indirect aggression than criminal tendencies and erratic lifestyle (secondary psychopathy). We also predicted that when controlling for each type of psychopathy, only primary psychopathy would be related to indirect aggression.

In terms of links with cortisol, we expected that high levels of primary psychopathy would be related to lower levels of cortisol whereas high levels of secondary psychopathy would be related to higher levels of cortisol. These relations were expected to be moderated by sex. Specifically, we hypothesized that the associations would be stronger in men than in women (consistent with Loney et al., 2006; O'Leary et al., 2007). We also expected that indirect aggression would be related to lower levels of cortisol, given the expected association between indirect aggression and primary psychopathy.

2. Method

2.1. Participants

Our sample consisted of 91 females (M age = 18.53, SD = 0.69) and 63 males (M age = 18.76, SD = 1.0). Participants were undergraduate students, enrolled in a mid-sized, urban, multi-ethnic university in Southern Ontario, Canada. Participants were recruited via posters that were displayed in common areas of the university's housing complexes. They were offered \$26 in total for providing eight saliva samples and completion of the questionnaire package. In order to reduce potential confounds, we asked participants about the following and examined these variables in subsequent analyses: (1) cigarette use, (2) use of psychotropic or steroid medication, (3) oral contraceptive use, and (4) waking and sleeping time.

2.2. Procedural overview

Participants were instructed to complete the questionnaire package and provide the saliva samples in their own dormitory room. They were also provided with both detailed oral and written instructions for the proper storage of the salivary samples. They were instructed to keep the samples frozen in their personal freezer until the end of the 4-day testing period at which point the researchers collected the completed questionnaire packages and salivary samples. Participants were asked to complete several self-report questionnaires pertaining to their use of indirect aggression and the level to which they agreed with statements assessing psychopathy.

2.3. Self-report measures

2.3.1. Indirect aggression

Participants were asked to fill out the 35-item Indirect Aggression Scale Aggressor Version (IAS-A; Forrest, Eatough, & Shevlin, 2005). Example items from this measure include: "How often have you done the following to your peers "criticized them in public", "turned other people against them", "spread rumours about them"

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