



## Investigating Theory of Mind deficits in nonclinical psychopathy and Machiavellianism

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### ABSTRACT

This study investigated the relationships between psychopathy (primary and secondary), Machiavellianism, global empathy, and Theory of Mind (ToM) using three behavioural ToM tasks in order to test for ToM deficits/differences in facial expressions, in the eye region, and in vocal affect. In addition, stimuli were categorised in terms of emotional valence (positive, neutral, and negative). Primary psychopathy, secondary psychopathy and Machiavellianism were positively associated with global empathy deficits and ToM deficits in relation to overall scores on the ToM tasks as well as ToM deficits to specific categories of emotional valence.

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### 1. Introduction

Successful social interaction is a vital component of the modern world, with our relationships, and many other important life outcomes, depending on it. Yet many of us are likely to encounter individuals with “socially aversive personality traits” (Lee & Ashton, 2005, p. 1572). Nonclinical psychopathy and Machiavellianism meet these criteria; they are similar (Fehr, Samsom, & Paulhus, 1992), yet ultimately distinguishable, ‘dark’ personality constructs (e.g., Paulhus & Williams, 2002; Vernon, Villani, Vickers, & Harris, 2008), typified by shallow affect, cruelty, guiltlessness, manipulation, and superficial charm.

Research indicates that psychopathy consists of two subtypes, namely, primary and secondary. Both types are characterised by hostility, impulsivity and aggression, but secondary psychopathy is also associated with social anxiety, introversion, moodiness and low self-esteem (Blackburn & Fawcett, 1999). Primary psychopathy, secondary psychopathy and Machiavellianism are highly inter-correlated (e.g., Ali, Amorim, & Chamorro-Premuzic, 2009) and like the psychopathy subtypes, Machiavellianism represents a strategy of conduct that involves manipulating others for personal gain and is associated with callousness and affective poverty (McHoskey, Worzel, & Szyarto, 1998).

Considering the negative impact that individuals with psychopathic and Machiavellian traits can have on others (e.g., McHoskey

et al., 1998), it is intuitive that both psychopathy and Machiavellianism would be associated with a deficiency in empathy, which is essentially the capacity to understand and share another person’s mental experience. Generally, researchers agree that empathy has an affective and a cognitive component (Lawrence, Shaw, Baker, Baron-Cohen, & David, 2004). Affective/emotional empathy can be defined as the capacity to *experience* the emotions of another, whereas cognitive empathy, often referred to as Theory of Mind (ToM), is conceptualised as the ability to *understand* and *infer* the emotions and emotional experiences of another (Jolliffe & Farrington, 2004).

Unsurprisingly, research indicates that nonclinical psychopathy and Machiavellianism are negatively associated with general empathy (e.g., Andrew, Cooke, & Muncer, 2008; Mahmut, Homewood, & Stevenson, 2008) and, in line with findings from clinical samples (e.g., Blair, 2005), nonclinical research also suggests that psychopathy and Machiavellianism may be associated with inappropriate empathic responding to affective stimuli, that is emotional or affective empathy (Ali et al., 2009).

High psychopathy and Machiavellianism scorers are successful at manipulation and deception (e.g., Austin, Farrelly, Black, & Moore, 2007; Hare, 1999), which would indicate some ToM (cognitive empathy) proficiency. However, findings in relation to ToM have been contradictory; some research indicates that individuals with clinical psychopathy do not have a ToM deficit compared to non-psychopathic controls (e.g., Richell et al., 2003), yet studies have also found deficits in ToM in individuals with clinical psychopathy (e.g., Dolan & Fullam, 2004). Critically, all the ToM studies mentioned here measured psychopathy globally; they did not

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distinguish between primary and secondary psychopathy, thereby failing to identify whether differences exist in relation to ToM ability between the two subtypes.

While ToM has been investigated to a certain extent in clinical psychopathy, to date, it has not been investigated in relation to adult nonclinical psychopathy, nor have differences between primary and secondary psychopathy been investigated in relation to ToM. This is surprising, especially when considering that the heterogeneity of psychopathy has been firmly established (Blackburn, 2009).

In relation to Machiavellianism, research demonstrates that it is associated with the inability to understand emotions and general emotional impoverishment (e.g., Wastell & Booth, 2003). Findings in relation to Machiavellianism and ToM are also contradictory; one study in an adult sample investigating Machiavellianism directly in relation to ToM (Paal & Bereczkei, 2007) did not find a significant relationship between Machiavellianism and ToM. However, in a sample of primary school children ToM ability was found to be negatively associated with Machiavellianism (Barlow, Qualter, & Stylianou, 2010).

The current study, to the best of our knowledge, is the first extensive study into ToM in the psychopathy subtypes and Machiavellianism in a nonclinical sample. There are surprisingly few studies which specifically examine the relationship between psychopathy and empathy (Kirsch & Becker, 2007) and investigating ToM in aversive traits is important because it is possible that individuals with psychopathic traits and Machiavellianism, rather than being unwilling to empathise, may actually have difficulties with ToM and therefore cannot sufficiently “put themselves into the mind of others” (Baron-Cohen, Wheelwright, Hill, Raste, & Plumb, 2001, p. 241).

The current study investigated both subtypes of psychopathy; past research in ToM in clinical populations have not differentiated between primary and secondary psychopathy and evaluating subtype similarities and differences in psychopathy may result in greater research validity and reliability (Hicks, Markon, Patrick, Krueger, & Newman, 2004). In addition, past research examining ToM and clinical psychopathy has focused primarily on male samples, research using female samples is therefore important as there is evidence for diverse expressions of psychopathic traits across the population (Skeem, Poythress, Edens, Lilienfeld, & Cale, 2003).

Three different ToM tasks were employed in order to test for ToM deficits/differences in full facial expressions, in the eye region alone and in vocal affect. Researchers propose that laboratory tasks that measure the affective, behavioural, and physiological correlates of psychopathy are required to gain greater insight into the processes underlying psychopathy in nonclinical samples (e.g., Hall & Benning, 2007). In addition, because research indicates different empathic reactions to positive and neutral content in psychopathy and Machiavellianism (Ali et al., 2009), this study as well as investigating global ToM scores, separates the emotional valence of the stimuli into positive (e.g., ‘happy’), neutral (e.g., ‘thoughtful’) and negative (e.g., ‘distress’) for each ToM task.

It was hypothesised that psychopathic and Machiavellian traits would be positively associated with lower global empathy, lower accuracy on the ToM tasks and be positively associated with specific difficulties in relation to certain emotional categories of stimuli. It was also hypothesised that global empathy would mediate the relationships between the personality traits and the ToM tasks.

## 2. Method

### 2.1. Participants

In all, 112 undergraduates (92 female, 20 male) participated in the study in exchange for course credits. Their ages ranged from 18 to 44 years ( $M = 20.74$ ,  $SD = 5.85$ ) and all participants had nor-

mal or corrected to normal vision and had no hearing impediments.

### 2.2. Self-report measures

#### 2.2.1. Empathy Quotient (EQ)

The self-report EQ scale (Baron-Cohen & Wheelwright, 2004) consists of 40 empathy questions and measures global empathy in both healthy and clinical populations with empathic dysfunction. It has demonstrated good reliability and validity (e.g., Baron-Cohen & Wheelwright, 2004). Cronbach's  $\alpha$  in the current sample was .83.

#### 2.2.2. Levenson Self-report Psychopathy Scale (LSRP)

The LSRP scale (Levenson, Kiehl, & Fitzpatrick, 1995) is a 26-item self-report measure designed to assess primary and secondary psychopathic attributes in nonclinical samples. The primary psychopathy scale consists of 16 items and the secondary psychopathy scale consists of 10 items. Cronbach's  $\alpha$  in the current study were .87 for the primary psychopathy scale and .77 for the secondary psychopathy scale (for details on the reliability and validity of the LSRP see McHoskey et al., 1998).

#### 2.2.3. Mach-IV

Machiavellianism was assessed with the Mach-IV (Christie & Geis, 1970), which has 20 items assessing individual differences in the tendency to use deceit in interpersonal relationships, have a cynical attitude to human nature and lack concern for conventional morality. The Mach-IV is the most widely-used scale for this construct and its reliability and the validity are well documented (e.g., Fehr et al., 1992). Cronbach's  $\alpha$  in the current study was .75.

### 2.3. ToM stimuli

#### 2.3.1. Faces test

The Faces test (Baron-Cohen, Wheelwright, & Jolliffe, 1997) tests the recognition of mental states from facial expressions. Participant are presented with 20 images with a target word and one foil word and are required to choose the word that best describes what the target (an actress) is thinking or feeling. The task is self-paced, although participants are asked to respond on the answer sheet as quickly as possible (Baron-Cohen et al., 1997). The test is scored by totalling the number of mental states correctly identified by participants.

Separate positive, neutral and negative valence scores were also computed. Using a similar methodology employed by Harkness, Sabbagh, Jacobson, Chowdrey, and Chen (2005), five independent raters (all graduate students) rated the 20 images from the Faces test with the correct answer (with no foil word) below each face picture. The raters scored the stimuli for emotional valence on a 7-point scale with 1 = very negative, 4 = neutral, and 7 = very positive. Those stimuli that had mean ratings significantly below neutral (one-sample  $t = 2.78$ ,  $df = 4$ ,  $\mu = 4$ ,  $p < .05$ , uncorrected) were classified as negative, those stimuli with mean ratings significantly above neutral were classified as positive and those stimuli that did not differ significantly from neutral were classified as neutral. Cronbach's  $\alpha$ 's were .67 for positive faces, .69 for neutral faces and .88 for negative faces.

#### 2.3.2. Reading the Mind in the Eyes Test (RMET) revised

The revised RMET (Baron-Cohen et al., 2001) is an advanced ToM test which measures the ability to decipher a mental state from 36 images of the eye region alone. Participants are required to select which of four complex mental state descriptors (one target word and three foil words) best describes the thoughts or

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