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# Distinguishing the relationship between different aspects of empathic responding as a function of psychopathic, autistic, and anxious traits



Lindsay D. Oliver<sup>d,e</sup>, Richard W.J. Neufeld<sup>a,c,d</sup>, Isabel Dziobek<sup>f</sup>, Derek G.V. Mitchell<sup>a,b,c,d,e,\*</sup>

<sup>a</sup> Department of Psychiatry, University of Western Ontario, London, Ontario, Canada

<sup>b</sup> Department of Anatomy & Cell Biology, University of Western Ontario, London, Ontario, Canada

<sup>c</sup> Department of Psychology, University of Western Ontario, London, Ontario, Canada

<sup>d</sup> Graduate Program in Neuroscience, Schulich School of Medicine & Dentistry, University of Western Ontario, London, Ontario, Canada

<sup>e</sup> Brain and Mind Institute, University of Western Ontario, London, Ontario, Canada

<sup>f</sup> Berlin School of Mind and Brain, Humboldt-Universität zu Berlin, Berlin, Germany

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# ABSTRACT

Although deficits in cognitive and emotional empathy are associated with specific developmental and neurological disorders, such as autism and psychopathy, little is known about the relationship between individual differences in psychopathic, autistic, and anxious traits, and behavioral measures of cognitive empathy, empathic concern, and affective sharing. Particularly, investigations of empathy rarely consider anxiety, or distinguish between different components of emotional empathy. Presently, healthy adults completed trait questionnaire measures and the Multifaceted Empathy Test, a performance-based task tapping cognitive empathy and multiple aspects of emotional empathy elicited by emotionally-charged realistic images. Heightened coldhearted psychopathic traits were associated with reduced empathic concern and affective sharing in response to affective images, and were unrelated to cognitive empathy performance. As expected, autistic traits were not associated with emotional empathy. Increased trait anxiety was linked to greater affective sharing, and arousal in particular, but this was driven by arousal elicited by contextual rather than social aspects of the stimuli. Thus, while coldhearted psychopathic traits appear to disrupt empathic processes thought to motivate altruistic behaviors, trait anxiety may influence subjective affective experience without instilling greater emotional empathy.

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### 1. Introduction

Empathy, the comprehension, identification, and/or vicarious experience elicited by another individual's state, plays a critical role in human social interaction. Accordingly, impaired empathy is a key feature of many debilitating developmental, neurological, and personality disorders. Empathy is largely considered to be a multidimensional construct that includes both cognitive and emotional facets (Blair, 2005; Shamay-Tsoory, 2011). Although the purported number of distinct facets of empathy varies, it has been proposed that empathy is comprised of cognitive empathy, empathic concern, and affective sharing components (Bernhardt & Singer, 2012; Decety & Cowell, 2014; Preston & de Waal, 2002; Zaki & Ochsner, 2012). Cognitive empathy, often used interchangeably with theory of mind (Blair, 2005; Lawrence, Shaw, Baker, Baron-Cohen, & David, 2004), refers to the ability to adopt another individual's perspective, and thereby infer their mental state. Whereas empathic concern refers to the motivation to care for another's welfare, affective sharing relates to the capacity

E-mail address: dmitch8@uwo.ca (D.G.V. Mitchell).

to share the emotional experience of another person. Thus, affective sharing involves an isomorphic emotional response to another individual, while empathic concern may not. Notably, the dissociation of cognitive and emotional empathy is supported by behavioral (Lockwood, Bird, Bridge, & Viding, 2013), lesion (Shamay-Tsoory, Aharon-Peretz, & Perry, 2009), and functional imaging (Fan, Duncan, de Greck, & Northoff, 2011) studies, but less is known about the dissociability of empathic concern versus affective sharing. Indeed, most investigations do not distinguish between these two putative components, instead using "emotional empathy" to refer to either.

Importantly, distinct facets of empathy seem to be differentially affected in particular disorders. Specifically, psychopathic tendencies are typically linked to impaired emotional empathy, but intact cognitive empathy. In contrast, autism spectrum disorder has been associated with deficits in cognitive but not emotional empathy in some studies. This double dissociation has been demonstrated behaviorally in youths with autism spectrum disorder versus psychopathic tendencies (Jones, Happe, Gilbert, Burnett, & Viding, 2010; Schwenck et al., 2012). Further, evidence for deficient emotional empathy in adults with psychopathy and youths with psychopathic tendencies has been inferred from demonstrations of impaired emotion recognition (Fairchild, Van Goozen, Calder, Stollery, & Goodyer, 2009; Hastings, Tangney, &

<sup>\*</sup> Corresponding author at: Brain and Mind Institute, University of Western Ontario, London, Ontario N6A 5B7, Canada.

Stuewig, 2008), dampened electrodermal responding to distress cues (Blair, 1999; Blair, Jones, Clark, & Smith, 1997), and abnormal BOLD response to emotional stimuli in affect-related brain regions (Decety, Skelly, Yoder, & Kiehl, 2014; Marsh et al., 2008). Cognitive empathy impairments in individuals with autism spectrum disorder have been demonstrated using false belief paradigms (Baron-Cohen, Leslie, & Frith, 1985) and mental state inference tasks (Abell, Happe, & Frith, 2000; Baron-Cohen, Wheelwright, Hill, Raste, & Plumb, 2001; Happe, 1994). In addition, adults with autism show a cognitive empathy deficit but intact empathic concern and affective arousal on the Multifaceted Empathy Test (Dziobek et al., 2008). However, it should be noted that there have been demonstrations of decreased emotional empathy scores on questionnaire measures in patients with autism spectrum disorder compared to healthy controls (Grove, Baillie, Allison, Baron-Cohen, & Hoekstra, 2014; Mathersul, McDonald, & Rushby, 2013b, 2013d; Shamay-Tsoory, Tomer, Yaniv, & Aharon-Peretz, 2002), as well as atypical autonomic arousal in response to face stimuli (Mathersul, McDonald, & Rushby, 2013a, 2013c). With regard to emotional empathy, it is presently unclear whether psychopathic traits are differentially related to empathic concern versus affective sharing. This is a particularly important question given that "empathy" is used to refer to multiple phenomena, which may differentially relate to behavioral outcomes. For example, evidence suggests that empathic concern, but not personal distress, gives rise to altruistic motivation (Batson, Fultz, & Schoenrade, 1987). As well, these phenomena may vary independently in some disorders. For example, frontotemporal dementia, which features empathy deficits, has been associated with impaired affective sharing but intact empathic concern (Oliver et al., 2015).

In the general population, evidence suggests that psychopathic (Edens, Marcus, Lilienfeld, & Poythress, 2006; Hare & Neumann, 2008) and autistic (Constantino & Todd, 2003; Posserud, Lundervold, & Gillberg, 2006) traits are continuously distributed. However, little is known about how individual differences in these traits map onto facets of empathic performance. There is some evidence that affectiveinterpersonal psychopathic trait levels are negatively correlated with questionnaire measures of empathic concern and feelings of positivity or negativity in response to emotional faces and stories (Seara-Cardoso, Dolberg, Neumann, Roiser, & Viding, 2013; Seara-Cardoso, Neumann, Roiser, McCrory, & Viding, 2012). Other work has shown that autistic trait levels in neurotypical adults are inversely associated with performance on theory of mind tasks (Baron-Cohen, Wheelwright, Hill, et al., 2001; Miu, Pana, & Avram, 2012; Voracek & Dressler, 2006). Bridging these findings, Lockwood et al. (2013) observed distinct relationships between high psychopathic traits and reduced valence ratings in response to emotional faces, and high autistic traits and diminished theory of mind performance in a community sample. However, this study did not include a measure of empathic concern. Thus, the relationship between psychopathic versus autistic traits with dissociable empathy indices has rarely been examined in healthy individuals.

Like psychopathic and autistic traits, trait anxiety varies continuously in the general population (Spielberger, Gorsuch, Lushene, Vagg, & Jacobs, 1983), and may have important implications for empathic responding. For example, arousal is widely considered to be a component of empathic responding (Decety, Norman, Berntson, & Cacioppo, 2012; Decety, Smith, Norman, & Halpern, 2014), and increased autonomic arousal to emotional stimuli has been observed in individuals with higher levels of emotional empathy (de Sousa et al., 2010; Mehrabian, Young, & Sato, 1988). Indeed, autonomic arousal is sometimes assumed to be an index of emotional empathy (Blair et al., 1997). Further, opposing patterns of amygdala activation have been associated with trait anxiety (Stein, Simmons, Feinstein, & Paulus, 2007) and emotional empathy (Seara-Cardoso, Sebastian, Viding, & Roiser, 2015) levels, suggesting that there may be overlap in the neurocognitive substrates driving these phenomena. However, despite the theoretical influence of trait anxiety on empathy, the inclusion of both anxiety and empathy indices is rare, and little work has focused on elucidating their association.

The present study had two main objectives. The first was to determine whether coldhearted psychopathic and autistic traits in a community sample are differentially associated with cognitive empathy, empathic concern, and affective sharing performance. Coldhearted psychopathic traits reflect the core emotional features of psychopathy, including a void of empathy and callousness towards others (Lilienfeld & Widows, 2005). Coldheartedness is also correlated with other emotional empathy indices (Fecteau, Pascual-Leone, & Théoret, 2008; Sandoval, Hancock, Poythress, Edens, & Lilienfeld, 2000), and Factor 1 of the Hare Psychopathy Checklist - Revised (Poythress, Edens, & Lilienfeld, 1998). Thus, based on the existing literature, coldheartedness was expected to be inversely associated with emotional empathy ratings, including measures of both empathic concern and affective sharing, but not cognitive empathy accuracy. Conversely, we hypothesized that autistic trait levels would be negatively correlated with cognitive empathy accuracy, but not emotional empathy ratings. The second key objective of this study was to elucidate the relationship between trait anxiety and empathy. Unlike coldhearted psychopathic traits, we hypothesized that anxiety would have a positive association with emotional empathy, but that the relationship would be less generalized. Specifically, we predicted that trait anxiety levels would be positively associated with measures of affective sharing, and arousal ratings in particular. This marks the first time that performance-based measures of cognitive empathy, empathic concern, and affective sharing have been indexed in relation to individual differences in psychopathic, autistic, and anxious traits in the same community sample.

#### 2. Materials and methods

#### 2.1. Participants

Ninety healthy individuals (54 females, 36 males) with a mean age of 21.7 years (range 18–36, SD = 3.2) took part in the experiment. As determined by screening, all participants were in good physical health and had no history of neurological disease, psychiatric problems, or head injury. Participants also had normal or corrected-to-normal vision and none reported color blindness. Flyers were used for participant recruitment. All participants granted informed consent and were compensated \$30 for their participation. This study was approved by the Health Sciences Research Ethics Board at the institution of research.

The present study was conducted alongside another distinct experiment. The order of task completion was randomized across participants. All participants completed the pertinent measures for this investigation.

#### 2.2. Measures

#### 2.2.1. Multifaceted Empathy Test (MET; Dziobek et al., 2008; Fig. 1)

The MET is a performance-based multi-dimensional measure of empathy. During the MET, participants answer questions which dissociably tap cognitive and emotional empathy in response to naturalistic emotionally-charged images. Each question was presented on a screen that also displayed the relevant image, and slide presentation was controlled by the researcher. All ratings were provided using a 9-point Likert scale with pictograms from the Self-Assessment Manikin (Lang, Bradley, & Cuthbert, 1997). Responses were voiced aloud and recorded by the researcher. Task completion required approximately 30 min. The MET consists of 23 pairs of realistic positive and negative images: a context-only picture, and a social picture with emotional individuals in this context. For each context-only picture, participants are asked to provide a valence rating and an arousal rating. For the social stimuli, cognitive empathy is indexed by asking participants how the person or people in the picture are feeling from four possible choices. Participants then provide an intensity rating for the emotional Download English Version:

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