Personality and Social Psychology

Psychopathy and the ability to read the "language of the eyes": Divergence in the psychopathy construct

ASLE M. SANDVIK,[1] ANITA L. HANSEN,[1,2] BJØRN HELGE JOHNSEN[1] and JON CHRISTIAN LABERG[1]

[1]*Faculty of Psychology, Dept. of Psychosocial Sciences, University of Bergen, Chrities gate 12, 5015, Bergen, Norway*
[2]*Centre for Research and Education in Forensic Psychiatry, Haukeland University Hospital, Sandviksleitet 1, 5021, Bergen, Norway*

Sandvik, A. M., Hansen, A. L., Johnsen, B. H. & Laberg, J. C. (2014). Psychopathy and the ability to read the "language of the eyes": Divergence in the psychopathy construct. *Scandinavian Journal of Psychology*.

The capacity to interpret others people's behavior and mental states is a vital part of human social communication. This ability, also called mentalizing or Theory of Mind (ToM), may also serve as a protective factor against aggression and antisocial behavior. This study investigates the relationship between two measures of psychopathy (clinical assessment and self-report) and the ability to identify mental states from photographs of the eye region. The participants in the study were 92 male inmates at Bergen prison, Norway. The results showed some discrepancy in connection to assessment methodology. For the self-report (SRP-III), we found an overall negative association between mental state discrimination and psychopathy, while for the clinical instrument (PCL-R) the results were more mixed. For Factor 1 psychopathic traits (interpersonal and affective), we found positive associations with discrimination of neutral mental states, but not with the positive or negative mental states. Factor 2 traits (antisocial lifestyle) were found to be negatively associated with discrimination of mental states. The results from this study demonstrate a heterogeneity in the psychopathic construct where psychopathic traits related to an antisocial and impulsive lifestyle are associated with lower ability to recognize others' mental states, while interpersonal and affective psychopathic traits are associated with a somewhat enhanced ability to recognize others' emotional states.

Key words: Psychopathy, aggression, PCL-R, SRP-III, Reading the Mind in the Eyes Test, Theory of Mind.

Asle M. Sandvik, Department of Psychosocial Science, University of Bergen, Christies gate 12, N-5015, Bergen, Norway. Tel: +47 55 58 89 04; fax: +47 55 58 98 79; e-mail: asle.sandvik@psysp.uib.no

INTRODUCTION

Psychopathy, often described as an empathic dysfunction, is characterized by callousness, manipulative behavior, superficial charm, shallow affects, irresponsibility, lack of remorse, and antisocial behavior. These symptoms made Cleckley (1941/1976) suggest that psychopaths suffer from a general "emotional poverty." Regardless of this empathic dysfunction or "poverty of emotions," psychopaths appear to be able to use emotional knowledge to manipulate, deceive and charm others. Studies of victim vulnerability suggest that psychopathy may be related to preserved or even enhanced ability to recognize cues of emotional vulnerability (Book, Quinsey & Langford, 2007; Wheeler, Book & Costello, 2009). A recent study (Pham, Ducro & Luminet, 2010) also found that forensic inmates who had high scores on psychopathy seemed to see themselves as better able to perceive others' emotions, and they also saw themselves as better able to manage emotional states. Together, these findings suggest that the general emotion poverty argument proposed by Cleckley (1941/1976) may not be entirely accurate. In fact, these findings might reflect a possible duality related to emotional skills, where such skills not only may be used for "good," but also may be used in manipulative and self-serving ways. This dualism or "emotional paradox" may also indicate that recognizing (cognitive) and experiencing (emotional) emotions may be distinct processes, where one can be intact without the other (Baron-Cohen & Wheelwright, 2004; Davis, 1983). Further study of this possible emotional duality is important as specific deficits or particularities could be linked to aggressive and antisocial behavior, and also be a possible target for interventions.

Emotional recognition

Facial expressions have important communicatory functions in conveying specific information to observers (Blair, 2003). To date, a number of studies have investigated the relationship between psychopathy and the ability to process and interpret others' facial expressions, but the findings are contradictory. Some studies find a general deficit (Hastings, Tangney & Stuewig, 2008; Lishner, Swim, Hong & Vitacco, 2011), or find deficits in recognition of specific expressions, such as fear, sadness, or disgust (Blair, Mitchell, Peschardt *et al*., 2004; Hansen, Johnsen, Hart, Waage & Thayer, 2008; Kosson, Suchy, Mayer & Libby, 2002; Marsh & Blair, 2008). Other studies do not find any deficits (Glass & Newman, 2006; Richell, Mitchell, Newman, Leonard, Baron-Cohen & Blair, 2003), and yet others find evidence of enhanced abilities (Book *et al*., 2007). The previous contradictory findings can maybe be accounted for by the use of different participant samples (students vs. forensic samples), diverse assessment methods of psychopathy and emotion recognition, or whether psychopathy was treated as a homogenous and/or dichotomous construct.

Assessment of psychopathy

Partly building on Cleckley's description of psychopathy Hare (1980) developed the Psychopathy Checklist (PCL). PCL and its later revised editions (PCL-R; Hare 1991, 2003) has over the last 30 years become the dominant instrument in the assessment and research on psychopathy (Hare & Neumann, 2008). The structural properties of the PCL-R have been the subject of much debate and research. Several statistically derived clusters or

factors have been proposed (for more information see: Bolt, Hare, Vitale & Newman, 2004; Cooke, Kosson & Michie, 2001). The originally proposed two-factor structure (Hare, 1991; Harpur, Hare & Hakstian, 1989) has gathered extensive empirical support and has dominated the literature (Hare, 2003; Swogger & Kosson, 2007). The two-factor model consists of two stable, correlated subtypes, or factors, of psychopathy. Factor 1 includes the interpersonal and affective (e.g., callousness and grandiosity) features of the psychopathic construct. Factor 2 reflects the unstable and antisocial lifestyle associated with psychopathy (Hicks, Markon, Patrick, Krueger & Newman, 2004; Skeem, Johansson, Andershed, Kerr & Louden, 2007).

As suggested in the 1991 PCL-R manual (Hare, 1991), researchers have, both previously and now, often compared psychopaths with non-psychopaths using a "cut-off score" (30 in the US or 25 in Europe; Cooke & Michie, 1999; Hare, 2003; Hare & Neumann, 2009). While the cut-off scores are statistically derived, the set thresholds are still more or less arbitrary. This dichotomization, as if there is a sharp dividing line between when an individual is or is not a psychopath, is highly problematic, and not sufficiently empirically supported (Hare, 1998, 2003; Skeem, Polaschek, Patrick & Lilienfeld, 2011). The weight of the more recent research suggests that psychopathic traits are best viewed as dimensional rather than categorical, and that, rather than being categorized as psychopaths or non-psychopaths, individuals are better viewed to exhibit more or less psychopathic traits. (Blackburn, 2007; Hare & Neumann, 2008; Skeem *et al*., 2011).

Psychopathy and the "reading of the mind in the eyes"

A part of cognitive empathy is the ability to understand and infer the mental state or the emotional experience of others, this skill is often called Theory of Mind (ToM; Ali & Chamorro-Premuzic, 2010; Fonagy & Target, 1997; Premack & Woodruff, 1978). Several studies have indicated that the eyes are disproportionally important when making judgments about complex mental states (Adolphs, Baron-Cohen & Tranel, 2002; Baron-Cohen, Wheelwright & Jolliffe, 1997), and the current study has investigated the relationship between psychopathy and the ability to read the "language of the eyes" in the Reading the Mind in the Eyes Test (RMET; Baron-Cohen, Wheelwright, Hill, Raste & Plumb, 2001). RMET is an advanced test of ToM capabilities and previous research using this test has also shown mixed findings regarding its relation to psychopathy. Richell and colleagues (2003), using PCL-R and a "cut-off" score, in a forensic sample, found no difference in RMET performance between psychopaths and non-psychopaths. However, more studies that also take into account the heterogeneity and dimensionality of the psychopathy construct are needed. One study that did take this into account is the study by Ali and Chamorro-Premuzic (2010). Using a self-report of psychopathy on a majority female student sample (Levenson Self-report Psychopathy Scale; Levenson, Kiehl & Fitzpatrick, 1995), they found a negative correlation between interpersonal and affective traits of psychopathy and RMET performance on the eyes with neutral valence. They also found a negative correlation between antisocial and impulsive lifestyle and the total performance on the RMET, and especially to test performance related to eyes with positive valence. Different psychopathy assessment methodology (total score vs. factor scores, clinical assessment vs. self-report), and different participants (forensic vs. students), make these two studies not directly comparable. The present study attempts to overcome some of these difficulties by including both clinical assessment and a self-report of psychopathy in one single emotion recognition experiment. As far as we know, the present study is the first study to do this, and this allows us to directly investigate whether assessment differences can explain some of the previous mixed findings. By using total score as well as a two-factor structure (Hare, 2003), and a dimensional approach to psychopathy, we might also be able to detect possible heterogeneity in the psychopathy construct and its relation to emotion processing.

METHOD

Participants

The participants in the current study were 92 male inmates at Bergen prison, Norway. The age of the participants ranged from 19 to 71 years of age (mean 33.47, SD 10.77). The participants were convicted for a variety of crimes, including simple theft, drug dealing, armed robbery, rape, child molesting and murder. Fifty-two percent of the participants had drug-related sentences, 42% had violence-related sentences, and 14% were sentenced for sexual offenses. The participants served sentences ranging from 6 weeks to 20 years (21 years is the longest possible sentence in Norway), with a mean of 6.3 years (SD 4.93). Number of prior convictions ranged from 0 to 51, with a mean of 6.3 (SD 7.37). Thirty-nine percent of the participants had only completed compulsorily schooling (9 years). Forty-six percent had no higher education beyond high school (many had finished high school in prison). All participants spoke Norwegian, and only nine were non-Norwegian citizens.

Measures

SRP-III. The Self-report Psychopathy Scale was constructed by Hare (1985), and is analogue to PCL-R. SRP has been found to correlate highly with other self-reports on psychopathy (e.g., Psychopathic Personality Inventory [PPI]; Benning, Patrick, Salekin & Leistico, 2005; Salekin, 2008). The current version, SRP-III (Jones & Paulhus, 2010; Paulhus, Neumann & Hare, in press), consists of 64 items, with responses made on a five-point Likert-scale (1–5).

The SRP-III originally uses a four-factor structure, but in line with previous use of the SRP-III (Lishner *et al*., 2011; Wheeler *et al*., 2009), a two-factor structure was used where we collapsed the callous affect facet and the interpersonal manipulation facet into Factor 1, while the erratic lifestyle facet and the criminal tendency facet was collapsed into Factor 2. The Cronbach's alpha for the present sample was 0.938 for the total score, 0.871 for Factor 1, and 0.907 for Factor 2.

PCL-R. The Psychopathy Checklist – Revised (Hare, 2003) is a 20-item instrument designed to measure the construct of psychopathy in research, prison, clinical and forensic psychiatric settings. Based on a semi-structured interview and an extensive file review (sentences, psychiatric evaluations, prison journals, etc.) the items are scored on a three-point scale (0 = not present, 1 = somewhat present, and 2 = definitely present). The PCL-R items were divided in to two factors according to the model described by Hare (2003). The PCL-R has shown good reliability and validity and is often considered the "gold standard" for the assessment of psychopathic personality (Cooke *et al*., 2001; Hare, 1999). The Cronbach's alpha for the present sample was 0.807 for the total score, 0.841 for Factor 1, and 0.806 for Factor 2. The inter-rater reliability for PCL-R ($N = 12$) ranged from good to excellent (McDowell, 2006): PCL-R total score, $ICC_1 = 0.921$; Factor 1, $ICC_1 = 0.720$; Factor 2, $ICC_1 = 0.880$.

RMET. A computerized version of the "Reading the Mind in the Eyes" Test – revised (RMET; Baron-Cohen *et al*., 2001) was used to assess ToM capabilities. The test consists of 36 black-and-white images of the eye region. The images are presented one by one, together with four adjectives (one target word and three foil words). The participants are requested to select which of the four adjectives that best describes what the person in the image is feeling (mental state). The test is self-paced, and a glossary, presenting a brief definition of each word, was available if needed. The test is scored by summarizing the number of correctly identified mental states. We also classified the stimuli used in the test into three separate emotional valence categories (positive, neutral, and negative). Using similar methodology as in previous studies (Ali & Chamorro-Premuzic, 2010; Harkness, Sabbagh, Jacobson, Chowdrey & Chen, 2005), five independent raters cataloged the 36 images (with the correct answer, and no foil words) in the three valence categories. All the raters agreed on all but five images, and these five images were excluded. To allow comparable scores, all the scores were divided on the number of stimuli in each category (total = 36; positive = 7; neutral = 7; negative = 17).

Procedure

The data were collected as a part of a larger ongoing study in Bergen Prison, studying dynamic risk factors for criminal behavior. The study was approved by the Norwegian Regional Ethics Committee for Medical Research (REK-West). All participation in the study was voluntary. As a requirement from the ethics committee, the initial information about the project, and the first request for participation, had to be conducted by a prison official. No information is therefore available regarding the non-participants. All participants were informed about their right to withdraw from the study at any time, and signed an informed consent statement. Of the 92 original participants, five withdrew from the study, and seven were released/transferred before they completed all the parts of the study (see Table 2). For all the eighty participants completing the PCL-R assessment, we also obtained scores on the SRP-III and the RMET.

The participants were tested on the computerized version of the RMET in groups of two to five inmates. Each participant was seated in front of a laptop PC and instructed to focus on the computer and respond to target stimuli according to the instructions. The rooms used for testing were relatively spacious (class-room style), and the participants were seated with enough distance to each other to avoid disturbance from the others in the testing group. The SRP-III forms were handed out along with other self-report measures (assessing general health, attitudes, and drug use) and filled out in the presence of a researcher.

The assessment interviews for the PCL-R were performed by either a clinical psychologist or an advanced psychology student (a total of four interviewers) trained in the use of the instrument. The interviews were performed individually, and lasted from two to six hours. The majority of the interviews were tape-recorded to enable assessment of inter-rater reliability. All available case history information (sentences, psychiatric evaluations, prison journals etc.) was also used in the scoring of the PCL-R.

Analysis

Analyses were performed using SPSS version 20.0 for Macintosh (IBM, Armonk, NY). Cronbach's alpha was used to assess the reliability of all the psychopathy measures used (PCL-R & SRP-III). Inter-rater reliability of the PCL-R was assessed with the use of one-way intra-class correlation coefficients (ICC_1). To explore the relationship between PCL-R, SRP-III and RMET, Pearson's product moment correlations were used.

Multiple regression analysis using the enter method was used to investigate the possible predictive power of psychopathy (Factor 1 and Factor 2) on performance on the RMET. Separate analyses were conducted for SRP-III and PCL-R, as both instruments are developed to measure the same underlying construct.

In the self-report (SRP-III), 1.8% of the values were missing. None of the 21.2% participants with missing values missed more than three of the total 64 items in the questionnaire. The missing data were handled through the use of multiple imputations with pooled data (Graham, 2009), and the reported results are not signicantly different from analyses conducted without the data imputatuion. Pair-wise deletion was used in the correlation and regression analysis.

RESULTS

Descriptive statistics

Descriptive statistics for SRP-III, PCL-R and RMET are presented in Table 1. Only four (5%) of the participants exceeded the PCL-R cut-off score of 30, but nine (11.25%) exceeded 25.

Correlations

Psychopathy measures. The inter-correlations between the psychopathy measures and their underlying factors are presented in Table 2.

Psychopathy and RMET. The correlation analyses revealed a significant negative correlation between SRP-III total score and the score on eyes with negative valence in the Adult Eye test ($r = –0.243$, $p = 0.043$). Using a two-factor structure on the SRP-III revealed no significant correlation between Factor 1 and any of the mood-states of the RMET scores. However, significant and negative relations were found between SRP-III Factor 2 and scores on the neutral and negative mental states in the RMET ($r = –0.264$, $p = 0.017$; $r = –0.256$, $p = 0.021$).

The correlation analyses showed no significant relation between the PCL-R total score and the scores on the RMET. However, subsequent analyses using the two-factor model revealed a positive and significant relation between PCL-R Factor 1 and the score on the neutral eyes in the RMET ($r = 0.292$, $p = 0.011$). There were also significant, but negative correlations between PCL-R Factor 2 and the RMET total score ($r = –0.247$, $p = 0.033$), the score on eyes with neutral valence ($r = –0.272$, $p = 0.018$), and the score on eyes with negative valence ($r = –0.278$, $p = 0.016$). All correlations between psychopathy and performance on RMET are reported in Table 3.

Table 1. *Mean standard deviations, minimum and maximum scores for the PCL-R, SRP-III and RMET (minimum and maximum obtainable scores in parenthesis)*

		N	Min (min possible)	Max (max possible)	Mean	SD
SRP-III	Total	84	103 (64)	275 (320)	194.17	34.49
	Factor 1	84	43 (32)	136 (160)	85.10	16.41
	Factor 2	84	48 (32)	146 (160)	106.01	21.83
PCL-R	Total	80	1 (0)	34 (40)	17.10	6.84
	Factor 1	80	0 (0)	16 (16)	6.21	3.87
	Factor 2	80	0 (0)	17 (18)	8.64	4.23
RMET	Total	86	0.14 (0)	0.86 (1)	0.59	0.15
	Positive	86	0.14 (0)	1 (1)	0.60	0.22
	Neutral	86	0.14 (0)	1 (1)	0.61	0.20
	Negative	86	0.06 (0)	0.88 (1)	0.56	0.17

Table 2. *Correlations between the self-report (SRP-III) and the clinical (PCL-R) assessment of psychopathy*

		PCL-R			SRP-III		
		Total	Factor 1	Factor 2	Total	Factor 1	Factor 2
PCL-R	Total						
	Factor 1	0.697**					
	Factor 2	0.759**	0.105				
SRP-III	Total	0.441**	–0.076	0.646**			
	Factor 1	0.394**	0.026	0.523**	0.904**		
	Factor 2	0.378**	–0.162	0.624**	0.944**	0.715**	

Note: **Correlation is significant at the 0.01 level (2-tailed).

Table 3. *Correlations between the psychopathy measures (SRP-III, and PCL-R) and performance on RMET*

		RMET			
		Total	Positive	Neutral	Negative
SRP-III	Total	–0.143	0.109	–0.192	–0.226*
	Factor 1	–0.047	0.102	–0.060	–0.136
	Factor 2	–0.195	0.092	–0.264*	–0.256*
PCL-R	Total	–0.121	–0.043	0.016	–0.158
	Factor 1	0.091	–0.080	0.292*	0.082
	Factor 2	–0.247*	0.018	–0.272*	–0.278*

Note: *Correlation is significant at the 0.05 level (2-tailed).

Multiple regression analyses

For the SRP-III, neither Factor 1 nor Factor 2 predicted performance on either the total score or the positive emotional valence scores on the RMET. For both the neutral and the negative valenced mental states on the RMET, Factor 2 was a significant predictor of performance ($\beta = –0.348$, $p = 0.010$; $\beta = –0.268$, $p = 0.047$). All the results for the regression analyses using SRP-III are found in Table 4.

When the total score of the RMET was used as outcome variable, Factor 2 of the PCL-R was a significant predictor of test performance ($\beta = –0.259$, $p = 0.029$). When the positive valence score was used as outcome variable, none of the PCL-R factors were significantly predictive of performance. For the neutral valence score, both PCL-R Factor 1 and Factor 2 were significant predictors of performance, but in opposite directions ($\beta = 0.324$, $p = 0.003$; $\beta = –0.307$, $p = 0.006$). In the last regression analysis, negative valence was used as an outcome variable, and PCL-R Factor 2 was significantly predictive of performance ($\beta = –0.290$, $p = 0.012$). All the results for the regression analyses using PCL-R are found in Table 5.

DISCUSSION

The present study investigated the relationship between different factors of psychopathy and the ability to read the "language of the eyes." The two psychopathy assessment methods used (self-report and clinical assessment) produced somewhat differing results, which may help explain some of the previous contradictory findings in the field.

For the SRP-III (self-report), the correlational analysis revealed a negative trend in the association between the total score and RMET performance. That the deficit was most evident for the eyes with negative valence corresponds with previous studies reporting specific deficits for psychopaths related to recognition of fear, sadness, and disgust (Blair *et al*., 2004; Kosson *et al*., 2002; Marsh & Blair, 2008). Divided into two factors, we found no significant relation between interpersonal and affective traits and emotion recognition. However, we found significant negative correlations between antisocial lifestyle and correct recognition of neutral and negative valenced mental states. The multiple regression analyses revealed that the interpersonal and affective traits assessed by the self-report (SRP-III) did not significantly predict performance on the RMET. However, self-reported antisocial lifestyle significantly predicted variability in performance on the neutral and negative valenced mental states, but not on the positive valenced mental states.

For the clinical assessment (PCL-R), there were no significant correlations between the total score and expression recognition. However, more differences in the results emerged when we subdivided both the PCL-R scores and the RMET scores (see Table 2). The interpersonal and affective traits of psychopathy were significantly and positively correlated with the recognition of the neutral valence mental states, while antisocial lifestyle was negatively correlated with the total score of the RMET. More specifically, the assessed antisocial lifestyle was related to deficits in recognition of neutral and negative valenced mental states, but not related to the ability to detect positively valenced mental states. The subsequent regression analyses revealed that antisocial lifestyle were negatively associated with performance on the RMET, except in regard to the positive emotional valenced mental states. These findings are in line with the results for the self-report. However, interpersonal and affective traits assessed with the PCL-R were positively associated with accuracy in identifying neutral valence mental states.

That most of our significant findings are related to the discrimination of neutral and negative mental states corresponds to other studies that have investigated the association between facial affect recognition abilities and psychopathy, although the specificities and directions of the results are somewhat different. Studies of children with psychopathic traits seem to find impairment in expression recognition, especially for sad and fearful expressions (Blair & Coles, 2000; Book *et al*., 2007; Sharp,

Table 4. *Summary of multiple regression analysis – SRP III*

Criterion		Predictors	*B*	*SE*	β	*p*
RMET:						
		Constant	25.094	3.383		
Total score	R2 = 0.045, ΔR2 = –0.021, *p* = 0.167	SRP-III – Factor 1	0.032	0.044	0.100	0.464
		SRP-III – Factor 2	–0.062	0.033	–0.254	0.063
		Constant	0.473	0.139		
Postive valence	R2 = 0.012, ΔR2 = –0.013, *p* = 0.624	SRP-III – Factor 1	0.001	0.002	0.072	0.602
		SRP-III – Factor 2	0.000	0.001	0.050	0.717
		Constant	0.814	0.131		
Neutral valence	R2 = 0.082, ΔR2 = 0.059, *p* = 0.034*	SRP-III – Factor 1	0.002	0.002	0.141	0.290
		SRP-III – Factor 2	–0.003	0.001	–0.348	0.010*
		Constant	0.770	0.108		
Negative valence	R2 = 0.066, ΔR2 = 0.042, *p* = 0.070	SRP-III – Factor 1	0.000	0.001	0.020	0.883
		SRP-III – Factor 2	–0.002	0.001	–0.268	0.047*

Note: **$p < 0.01$; *$p < 0.05$.

Table 5. *Summary of multiple regression analysis – PCL-R*

Criterion		Predictors	*B*	*SE*	β	*p*
RMET:						
		Constant	23.289	1.603		
Total score	R2 = 0.075, ΔR2 = 0.049, *p* = 0.061	PCL-R – Factor 1	0.162	0.155	0.119	0.300
		PCL-R – Factor 2	–0.330	0.145	–0.259	0.029*
		Constant	0.615	0.070		
Postive valence	R2 = 0.007, ΔR2 = −0.020, *p* = 0.773	PCL-R – Factor 1	–0.005	0.007	–0.083	0.485
		PCL-R – Factor 2	0.001	0.006	0.027	0.820
		Constant	0.651	0.057		
Neutral valence	R2 = 0.178, ΔR2 = 0.155, *p* = 0.001**	PCL-R – Factor 1	0.017	0.006	0.324	0.003**
		PCL-R – Factor 2	–0.015	0.005	–0.307	0.006**
		Constant	0.646	0.052		
Negative valence	R2 = 0.090, ΔR2 = 0.065, *p* = 0.034*	PCL-R – Factor 1	0.005	0.005	0.113	0.322
		PCL-R – Factor 2	–0.012	0.005	–0.290	0.012*

Note: **$p < 0.01$; *$p < 0.05$.

2008). A meta-analysis by Marsh and Blair (2008) concluded that there was a deficit in recognizing fearful expressions among antisocial populations. However, most of these studies used whole face stimuli. Studies have indicated that while the whole face provides more information for the basic mental states (anger, disgust, fear, happiness, sadness, and surprise), the eye region is disproportionally important for the interpretation of complex mental states (e.g., guilt, bored, arrogant, flirting; Adolphs *et al*., 2002; Baron-Cohen *et al*., 1997; Morris, deBonis & Dolan, 2002). The use of just the eye region and complex mental states might make the RMET a more "pure" cognitive measure, as the use of whole faces may trigger a more automatic and emotional response which makes the use of whole faces a more mixed affective and cognitive measure (Adolphs *et al*., 2002; Baron-Cohen *et al*., 1997). That most other studies have used basic emotions and whole face stimuli may also account for some of the differing findings from our study.

The results of our study fit with a number of other studies that have failed to detect any link between general ToM impairments and total score of psychopathy (Blair *et al*., 1996; Dolan & Fullam, 2004; Shamay-Tsoory, Harari, Aharon-Peretz & Levkovitz, 2010). In regard to other studies that have used the RMET, our results are in some way consistent with Richell and colleagues' (2003) finding of no generalized impairment for psychopaths on the RMET. They used PCL-R on a forensic sample, but used only the total score (non-dimensionally). This corresponds to our results of no significant association between PCL-R total score and expression recognition. However, the treatment of psychopathy as a homogenous and dichotomous concept may have eluded important aspects of the relationship.

Ali and Chamorro-Premuzic (2010), who used a self-report of psychopathy, did look at different facets of psychopathy. They found a negative association between interpersonal and affective traits and RMET total score, and on the performance on the neutral valenced mental states, whereas we found no significant correlations between RMET performance and such traits. Where Ali and Chamorro-Premuzic (2010) for the antisocial lifestyle traits found a negative correlation with the RMET's total score, and to the positive valence score, we found significant negative correlations with the negative and neutral valence score. One limitation with Ali and Chamorro-Premuzic's study is the use of a student sample (majority female). No descriptive results are reported, but one can, on basis of other studies (Coid, Yang, Ullrich, Roberts & Hare, 2009; Salekin, Trobst & Krioukova, 2001), assume lower levels, and differing distribution of psychopathic traits in this non-forensic sample. Another limitation is the use of only a

self-report of psychopathy. One of the greatest advantages of self-reports is economy. It often demands little time, training and other resources, but the use of self-reports to detect or measure psychopathy has received criticism. Our study, in line with several other studies, indicates a possible deficit in self-reports to capture the interpersonal and affective traits of psychopathy (Hare & Neumann, 2009; Harpur *et al*., 1989; Sandvik, Hansen, Kristensen, Johnsen, Logan & Thornton, 2012). However, in a forensic setting, Factor 2 traits (antisocial behavior) seem to be well captured by self-reports.

A recent study by Konrath, Corneille, Bushman and Luminet (2014) looked at how dispositional narcissism and exploitativeness, which theoretically can be linked to the interpersonal and affective traits of psychopathy, was related to emotion recognition in the RMET in a non-forensic sample. They found a positive association between these traits and performance on the RMET, which is in line with our results, but at odds with Ali and Chamorro-Premuzic's (2010) study.

That we find antisocial lifestyle to be related to poorer mentalizing capabilities corresponds with the proposed link between mentalizing and antisocial and aggressive behavior (Fonagy & Target, 1997; Taubner, White, Zimmermann, Fonagy & Nolte, 2013). Our findings of enhanced capabilities of discrimination of neutral mental states related to interpersonal and affective traits of psychopathy (PCL-R) may correspond to the view of psychopaths as adapt social predators that may have enhanced ability to recognize small cues of emotional vulnerability (Book *et al*., 2007; Hare, 2001; Wheeler *et al*., 2009). As the emotional interpretation of just the eye region is regarded a cognitive task, this also corresponds with previous findings of better cognitive functioning for individuals scoring high on interpersonal traits of psychopathy (Hansen, Johnsen, Thornton, Waage & Thayer, 2007). Mentalizing capabilities seem to have an inhibitory effect on aggression and violence (Fonagy & Target, 1997; Taubner *et al*., 2013). The fact that those with psychopathic interpersonal and affective traits do not seem to be better at recognizing the more extreme emotions (negative or positive), may explain why this mentalizing capability does not inhibit aggression and violence.

Limitations and further research

The present study has some limitations that need to be addressed. The limited sample size, and the inclusion of only male prison inmates, may reduce the generalizability of the findings, and makes it impossible to investigate possible gender differences. The research on psychopathy in the general population has proven difficult (most use only self-reports), and a large majority of the research in the field is therefore conducted in forensic settings (Hare & Neumann, 2008; Neumann & Hare, 2008). However, the manifestation of psychopathic traits in a prison sample might not be equivalent to such traits for a non-incarcerated population. One possible limiting factor is the low and non-significant correlation ($r = 0.105$, $p = 0.352$) found between PCL-R Factor 1 and Factor 2 in this sample. This is substantially lower than the 0.50 reported in the PCL-R manual (Hare, 1991), however, other studies including inter-correlations between the factors reveal somewhat more divergence ($r = 0.25$ to 0.64; Haapasalo & Pulkkinen, 1992; Serin, 1992, 1996). Another limitation is that the use of the RMET and the three valence scores (positive, neutral, and negative) also prevent us from looking at differences in judgment of specific facial expression (e.g., fear, disgust).

Further studies are required to explore this possible emotional paradox related to psychopathy, and it is especially important to include instruments that are able to measure and separate both cognitive and emotional components of empathy. Further investigations of the emotional and cognitive processes involved in aggression and violence are important, as individual differences in such dynamic functions can possibly be targets for interventions, as well as an aid in risk assessments.

SUMMARY AND CONCLUSION

Our study highlights that the choice of assessment methodology has consequence for the results. The current study also strengthens the idea that psychopathy is a heterogeneous and dimensional construct. It illustrates that complexities of the psychopathic construct and different assessment methodology might affect the results. Especially the use of self-report may elude the results regarding interpersonal and affective traits of psychopathy. The results indicate that the more general "poverty of emotion" for psychopaths, suggested by Cleckley (1941/1976), may not be entirely correct. A more promising explanation seems to be that an "emotional paradox" exists, where some individuals with interpersonal and affective traits of psychopathy retain, or even in some instances possess an enhanced competence in detecting others' emotions, an ability that can be used to detect emotional vulnerability, and to manipulate and deceive others. The study also highlights the difference in cognitive and affective measures of empathy, which may be seen as distinct processes, where one can be intact without the other (Baron-Cohen & Wheelwright, 2004; Davis, 1983). While the present study finds intact functions of cognitive empathy related to psychopathy, it remains questionable whether this cognitive response will be followed by an affective response related to emotional empathy. Findings of intact cognitive empathy but with impairments related to emotional or affective empathy would correspond to Johns and Quay's (1962, p. 217) famous quote: "The psychopath can thus be said to be one who knows the words but not the music; the denotative meaning of words and phrase may be intact, but the connotative emotional or motivational component is lost."

REFERENCES

Adolphs, R., Baron-Cohen, S. & Tranel, D. (2002). Impaired recognition of social emotions following amygdala damage. *Journal of Cognitive Neuroscience*, *14*, 1264–1274.

Ali, F. & Chamorro-Premuzic, T. (2010). Investigating Theory of Mind deficits in nonclinical psychopathy and machiavellianism. *Personality and Individual Differences*, *49*, 169–174.

Baron-Cohen, S. & Wheelwright, S. (2004). The empathy quotient: An investigation of adults with Asperger syndrome or high functioning autism, and normal sex differences. *Journal of Autism and Developmental Disorders*, *34*, 163–175.

Baron-Cohen, S., Wheelwright, S., Hill, J., Raste, Y. & Plumb, I. (2001). The "Reading the Mind in the Eyes" test revised version:

A study with normal adults, and adults with Asperger syndrome or high-functioning autism. *Journal of Child Psychology and Psychiatry and Allied Disciplines*, *42*, 241–251.

Baron-Cohen, S., Wheelwright, S. & Jolliffe, T. (1997). Is there a ''language of the eyes''? Evidence from normal adults, and adults with autism or Asperger Syndrome. *Visual Cognition*, *4*, 311–331.

Benning, S. D., Patrick, C. J., Salekin, R. T. & Leistico, A. M. R. (2005). Convergent and discriminant validity of psychopathy factors assessed via self-report – a comparison of three instruments. *Assessment*, *12*, 270–289.

Blackburn, R. (2007). Personality disorder and psychopathy: Conceptual and empirical integration. *Psychology Crime & Law*, *13*, 7–18.

Blair, R. J. R. (2003). Facial expressions, their communicatory functions and neuro-cognitive substrates. *Philosophical Transactions of the Royal Society B-Biological Sciences*, *358*, 561–572.

Blair, R. J. R. & Coles, M. (2000). Expression recognition and behavioural problems in early adolescence. *Cognitive Development*, *15*, 421–434.

Blair, R. J. R., Mitchell, D. G. V., Peschardt, K. S., Colledge, E., Leonard, R. A., Shine, J. H., *et al*. (2004). Reduced sensitivity to others' fearful expressions in psychopathic individuals. *Personality and Individual Differences*, *37*, 1111–1122.

Blair, R. J. R., Sellars, C., Strickland, I., Clark, F., Williams, A., Smith, M. & Jones, L. (1996). Theory of mind in the psychopath. *Journal of Forensic Psychiatry*, *7*, 15–25.

Bolt, D. A., Hare, R. D., Vitale, J. E. & Newman, J. P. (2004). A multigroup item response theory analysis of the Psychopathy Checklist-Revised. *Psychological Assessment*, *16*, 155–168.

Book, A. S., Quinsey, V. L. & Langford, D. (2007). Psychopathy and the perception of affect and vulnerability. *Criminal Justice and Behavior*, *34*, 531–542.

Cleckley, H. M. (1941/1976). *The mask of sanity* (5th ed.). St. Louis, MO: Mosby.

Coid, J., Yang, M., Ullrich, S., Roberts, A. & Hare, R. D. (2009). Prevalence and correlates of psychopathic traits in the household population of Great Britain. *International Journal of Law and Psychiatry*, *32*, 65–73.

Cooke, D. J., Kosson, D. S. & Michie, C. (2001). Psychopathy and ethnicity: Structural, item, and test generalizability of the psychopathy checklist-revised (PCL–R) in Caucasian and African American participants. *Psychological Assessment*, *13*, 531–542.

Cooke, D. J. & Michie, C. (1999). Psychopathy across cultures: North America and Scotland compared. *Journal of Abnormal Psychology*, *108*, 58–68.

Davis, M. H. (1983). Measuring individual-differences in empathy – Evidence for a multidimensional approach. *Journal of Personality and Social Psychology*, *44*, 113–126.

Dolan, M. & Fullam, R. (2004). Theory of mind and mentalizing ability in antisocial personality disorders with and without psychopathy. *Psychological Medicine*, *34*, 1093–1102.

Fonagy, P. & Target, M. (1997). Attachment and reflective function: Their role in self–organization. *Development and Psychopathology*, *9*, 679–700.

Glass, S. J. & Newman, J. P. (2006). Recognition of facial affect in psychopathic offenders. *Journal of Abnormal Psychology*, *115*, 815–820.

Graham, J. W. (2009). Missing data analysis: Making it work in the real world. *The Annual Review of Psychology*, *60*, 549–576.

Haapasalo, J. & Pulkkinen, L. (1992). The Psychopathy Checklist and non-violent offender groups. *Criminal Behaviour and Mental Health*, *2*, 315–328.

Hansen, A. L., Johnsen, B. H., Hart, S., Waage, L. & Thayer, J. F. (2008). Brief communication: Psychopathy and recognition of facial expressions of emotion. *Journal of Personality Disorders*, *22*, 639–644.

Hansen, A. L., Johnsen, B. H., Thornton, D., Waage, L. & Thayer, J. F. (2007). Facets of psychopathy and heart rate variability and cognitive functions. *Journal of Personality Disorders*, *21*, 568–582.

Hare, R. D. (1980). A Research scale for the assessment of psychopathy in criminal populations. *Personality and Individual Differences*, *1*, 111–119.

Hare, R. D. (1985). Comparison of procedures for the assessment of psychopathy. *Journal of Consulting and Clinical Psychology*, *53*, 7–16.

Hare, R. D. (1991). *The Hare Psychopathy Checklist-Revised*. Toronto: Multi-Health Systems.

Hare, R. D. (1998). The Hare PCL-R: Some issues concerning its use and misuse. *Legal and Criminological Psychology*, *3*, 99–119.

Hare, R. D. (1999). Psychopathy as a risk factor for violence. *Psychiatric Quarterly*, *70*, 181–197.

Hare, R. D. (2001). Psychopaths and their nature: Some implications for understanding human predatory violence. In A. Raine & J. Sanmartín (Eds.), *Violence & psychopahty* (pp. 5–34). New York: Kluwer Academic / Plenum Publishers.

Hare, R. D. (2003). *Hare Psychopathy Checklist -Revised (PCL-R)* (2nd ed.). North Tonawada, NY: Multi-Health Systems Inc.

Hare, R. D. & Neumann, C. S. (2008). Psychopathy as a clinical and empirical construct. *Annual Review of Clinical Psychology*, *4*, 217–246.

Hare, R. D. & Neumann, C. S. (2009). Psychopathy: Assessment and forensic implications. *Canadian Journal of Psychiatry-Revue Canadienne De Psychiatrie*, *54*, 791–802.

Harkness, K. L., Sabbagh, M. A., Jacobson, J. A., Chowdrey, N. K. & Chen, T. (2005). Enhanced accuracy of mental state decoding in dysphoric college students. *Cognition & Emotion*, *19*, 999–1025.

Harpur, T. J., Hare, R. D. & Hakstian, A. R. (1989). Two-factor conceptualization of psychopathy: Construct validity and assessment implications. *Psychological Assessment*, *1*, 6–17.

Hastings, M. E., Tangney, J. P. & Stuewig, J. (2008). Psychopathy and identification of facial expressions of emotion. *Personality and Individual Differences*, *44*, 1474–1483.

Hicks, B. M., Markon, K. E., Patrick, C. J., Krueger, R. F. & Newman, J. P. (2004). Identifying psychopathy subtypes on the basis of personality structure. *Psychological Assessment*, *16*, 276–288.

Johns, J. H. & Quay, H. C. (1962). Effect of social reward on verbal conditioning in psychopathic and neurotic military offenders. *Journal of Consulting Psychology*, *26*, 217–220.

Jones, D. N. & Paulhus, D. L. (2010). Different provocations trigger aggression in narcissists and psychopaths. *Social Psychological and Personality Science*, *1*, 12–18.

Konrath, S., Corneille, O., Bushman, B. J. & Luminet, O. (2014). The relationship between narcissistic exploitativeness, dispositional empathy, and emotion recognition abilities. *Journal of Nonverbal Behavior*, *38*, 129–143.

Kosson, D. S., Suchy, Y., Mayer, A. R. & Libby, J. (2002). Facial affect recognition in criminal psychopaths. *Emotion*, *2*, 398–411.

Levenson, M. R., Kiehl, K. A. & Fitzpatrick, C. M. (1995). Assessing psychopathic attributes in a noninstitutionalized population. *Journal of Personality and Social Psychology*, *68*, 151–158.

Lishner, D. A., Swim, E. R., Hong, P. Y. & Vitacco, M. J. (2011). Psychopathy and ability emotional intelligence: Widespread or limited association among facets? *Personality and Individual Differences*, *50*, 1029–1033.

Marsh, A. A. & Blair, R. J. R. (2008). Deficits in facial affect recognition among antisocial populations: A meta-analysis. *Neuroscience and Biobehavioral Reviews*, *32*, 454–465.

McDowell, I. (2006). *Measuring health. A guide to rating scales and questionnaires*. New York: Oxford Universty Press.

Morris, J. S., deBonis, M. & Dolan, R. J. (2002). Human amygdala responses to fearful eyes. *Neuroimage*, *17*, 214–222.

Neumann, C. S. & Hare, R. D. (2008). Psychopathic traits in a large community sample: Links to violence, alcohol use, and intelligence. *Journal of Consulting and Clinical Psychology*, *76*, 893–899.

Paulhus, D. L., Neumann, C. S. & Hare, R. D. (in press). *Manual for the Self–Report Psychopathy Scale*. Toronto: Mulit-Health Systems.

Pham, T. H., Ducro, C. & Luminet, O. (2010). Psychopathy, alexithymia and emotional intelligence in a forensic hospital. *International Journal of Forensic Mental Health*, *9*, 24–32.

Premack, D. & Woodruff, G. (1978). Does the chimpanzee have a theory of mind. *Behavioral and Brain Sciences*, *1*, 515–526.

Richell, R. A., Mitchell, D. G. V., Newman, C., Leonard, A., Baron-Cohen, S. & Blair, R. J. R. (2003). Theory of mind and psychopathy: Can psychopathic individuals read the 'language of the eyes'? *Neuropsychologia*, *41*, 523–526.

Salekin, R. T. (2008). Psychopathy and recidivism from mid-adolescence to young adulthood: Cumulating legal problems and limiting life opportunities. *Journal of Abnormal Psychology*, *117*, 386–395.

Salekin, R. T., Trobst, K. K. & Krioukova, M. (2001). Construct validity of psychopathy in a community sample: A nomological net approach. *Journal of Personality Disorders*, *15*, 425–441.

Sandvik, A. M., Hansen, A. L., Kristensen, M. V., Johnsen, B. H., Logan, C. & Thornton, D. (2012). Assessment of psychopathy: Intercorrelations between Psychopathy Checklist Revised, Comprehensive Assessment of Psychopathic Personality – Institutional Rating Scale, and Self-Report of Psychopathy Scale-III. *International Journal of Forensic Mental Health*, *11*, 280–288.

Serin, R. C. (1992). The clinical application of the Psychopathy Checklist-Revised (PCL–R) in a prison population. *Journal of Clinical Psychology*, *48*, 637–642.

Serin, R. C. (1996). Violent recidivism in criminal psychopaths. *Law and Human Behavior*, *20*, 207–217.

Shamay-Tsoory, S. G., Harari, H., Aharon-Peretz, J. & Levkovitz, Y. (2010). The role of the orbitofrontal cortex in affective theory of mind deficits in criminal offenders with psychopathic tendencies. *Cortex*, *46*, 668–677.

Sharp, C. (2008). Theory of Mind and conduct problems in children: Deficits in reading the "emotions of the eyes". *Cognition & Emotion*, *22*, 1149–1158.

Skeem, J. L., Johansson, P., Andershed, H., Kerr, M. & Louden, J. E. (2007). Two subtypes of psychopathic violent offenders that parallel primary and secondary variants. *Journal of Abnormal Psychology*, *116*, 853–853.

Skeem, J. L., Polaschek, D. L. L., Patrick, C. J. & Lilienfeld, S. O. (2011). Psychopathic personality: Bridging the gap between scientific evidence and public policy. *Psychological Science in the Public Interest*, *12*, 95–162.

Swogger, M. T. & Kosson, D. S. (2007). Identifying subtypes of criminal psychopaths – a replication and extension. *Criminal Justice and Behavior*, *34*, 953–969.

Taubner, S., White, L. O., Zimmermann, J., Fonagy, P. & Nolte, T. (2013). Attachment-related mentalization moderates the relationship between psychopathic traits and proactive aggression in adolescence. *Journal of Abnormal Child Psychology*, *41*, 929–938.

Wheeler, S., Book, A. & Costello, K. (2009). Psychopathic traits and perceptions of victim vulnerability. *Criminal Justice and Behavior*, *36*, 635–648.

Received 25 November 2013, accepted 17 April 2014