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Empathy and altruistic behavior in antisocial violent offenders with psychopathic traits

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ABSTRACT

Deficiencies in empathic functioning are considered a core characteristic of violent behavior. Enhancing empathy in aggressive populations may thus represent a promising intervention target. Hence, the aims of the present work were two-fold: First, we wanted to thoroughly assess empathic competencies and second, we aimed to investigate effects of an empathy induction on experienced empathy levels and prosocial behavior in a sample of violent offenders relative to matched controls. Empathy was assessed using both self-report as well as objective measures. For the empathy induction, participants were presented with empathy inducing and control videos. To assess the effects of the empathy induction on behavior, participants played a dictator game indicative of prosocial behavior after every video. Violent offenders showed no systematic impairment in empathy measures. Despite lower shares in the dictator game across conditions, the empathy induction led to a substantial increase in prosocial behavior in both groups. Importantly, high psychopathy scores were distinctively associated with lower self-reported empathy levels, an attenuated affective responsiveness to the empathy induction, and less altruistic behavior. Treatment programs aiming to improve empathy should take individual characteristics into account and may be applied to distinctive subgroups rather than to violent offenders per se.

1. Introduction

Researchers have long posited a link between a lack of empathic skills and offending. More specifically, it has been proposed that the direct experience of distress should interrupt further violent behaviors in aggressors (Miller and Eisenberg, 1988) and that particularly violent forms of offending are linked with a profound lack of empathy (Jolliffe and Farrington, 2004).

The population of violent offenders, however, is heterogeneous, and consists of subgroups with distinct etiologies and response to treatment (Hodgins, 2007). Most repeated violent offenders demonstrate a stable pattern of antisocial and aggressive behavior that begins during childhood and can be described as being emotionally instable, impulsive, and prone to reactive aggression. However, a minority of this population is additionally characterized by deficient affective experience as well as a severe lack of empathy and remorse, which have been subsumed under the concept of psychopathy. This violent subgroup with psychopathic personality traits has been extensively studied in the last decades and there is strong evidence suggesting that these individuals display profound and wide-spread emotional dysfunctions (Kiehl, 2006; Marsh and Blair, 2008).

Prominent psychological accounts, such as the violence inhibition mechanism model (Blair, 1995; 2001; 2003), assume disruptions in emotion recognition to compromise and undermine the development of more complex social cognitive abilities like empathy and morality in individuals with persistent forms of violent and psychopathic behavior. While a broad body of research has investigated basic social cognitive prerequisites (such as facial affect recognition) in these individuals (Blair et al., 2004; Hastings et al., 2008; Marsh and Blair, 2008; Schönenberg et al., 2014; Schönenberg et al., 2013; Schönenberg et al., 2015, for a review, see Chapman et al., 2018), the link between higher-order social cognitive abilities, i.e., empathy, and persistent violent behavior is not yet understood. Furthermore, it is entirely unclear whether enhancements of empathic reactions in these populations would have any behavioral consequences, such as increases in prosocial behavior. Despite evidence which indicates that empathy promotes the inhibition of aggressive behavior following provocation in healthy individuals (Klimecki et al., 2016), similar studies in violent offender populations are pending. Here, we attempted to address these research questions, as these insights are highly relevant in their potential to

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inform prevention and intervention attempts.

Current multidimensional models of empathy propose a distinction between cognitive and affective components of empathy: Cognitive empathy comprises both the ability to understand others' thoughts and intentions (i.e., cognitive Theory of Mind; ToM; Frith and Frith, 2003, Premack and Woodruff, 1978) as well as others' feelings (i.e., affective ToM; Shamay-Tsoory, 2011). Affective empathy further denotes the ability to actually share the emotional state/feeling of the other person (Davis, 1983; Decety and Jackson, 2004; Singer, 2006). With regard to cognitive empathy, studies employing tasks that require inferences of the main characters' motives and intentions in interactive contexts documented difficulties in violent and psychopathic individuals for static (Dolan and Fullam, 2004), schematic (Shamay-Tsoory et al., 2010), and dynamic stimuli (Brook and Kosson, 2013). Despite the wide-spread notion that psychopaths have a profound lack in empathic skills (Blair, 2007), research on affective components of empathy in violent and psychopathic populations is scarce. The majority of existing studies largely relies on self-report measures indicating no abnormalities in these populations (Dolan and Fullam, 2004; Domes et al., 2013; Shamay-Tsoory et al., 2010). By contrast, experimental studies provide indirect evidence for impairments in affective empathy, reporting attenuated skin conductance responses to social distress cues (Blair, 2007; Seidel et al., 2013) as well as an overall reduced autonomic and empathic responsiveness to others' pain in psychopaths relative to healthy controls (Pfabigan et al., 2015). Further, it has been shown that psychopaths exhibit a significantly dampened response to empathy-eliciting stimuli in brain regions involved in affective empathy as compared to controls (Decety et al., 2013a). Interestingly, there is first evidence that such spontaneous group differences in empathy-related neural processes can be significantly reduced under certain circumstances, i.e., when psychopaths are explicitly instructed to empathize with others (Meffert et al., 2013).

Despite these intriguing preliminary findings, no previous study investigated whether it is possible to enhance empathic reactions in these populations and whether this indeed affects social behavior. Given the severity and chronicity of violent behavior and psychopathy, this pressing research question is a highly relevant prerequisite for the development of effective treatment attempts. In healthy individuals, there is a longstanding history of research suggesting a close connection between empathy and prosocial behavior (Eisenberg and Miller, 1987). Batson (1990) formulated the empathy-altruism hypothesis stating that altruistic behavior is motivated by empathy felt for a deserving person. Correspondingly, Edele et al. (2013) found that affective empathy predicted altruistic sharing in the dictator game, a widely used economic measure for altruism in which participants are typically asked to split a given amount of monetary units at any rate between themselves and another player who has no alternative but to accept the division (Kahneman et al., 1986). Recent results from our research group underpin the causal role of empathy in the context of altruism (Klimecki et al., 2016). In that study, healthy individuals were presented with a newly developed task, the empathic dictator game, which extends the classical dictator game by an empathy induction. For this purpose, participants watched empathy inducing or control videos and were subsequently asked to split a given amount of monetary units with the person in the respective video according to their wishes. Results showed that empathy induction promoted altruistic sharing, as giving rates were more than twice as high as average shares reported for standard dictator game scenarios (Engel, 2011). Furthermore, the extent of subjectively experienced empathy predicted offer sizes. To date, only few studies investigated sharing behavior in the dictator game in violent and psychopathic populations, reporting a negative association with psychopathic traits (Berg et al., 2013) as well as lower shares in violent offenders (Mayer et al., 2018) and psychopaths (Koenigs et al., 2010, but see Radke et al., 2013). However, the relationship between altered sharing behavior in violent offenders and empathic skills as well as the question whether an empathy induction can help to increase prosocial behavior in violent offenders remains unresolved.

To address these questions, we aimed to thoroughly assess cognitive as well as affective facets of empathy in violent offenders with psychopathic traits relative to matched controls. For this purpose, we measured both self-report data and performance in the Movie for the Assessment of Social Cognition (MASC; Dziobek et al., 2006), a video-based measure sensitive to deficits in cognitive empathy/ToM. Moreover, cognitive and affective empathy were assessed following an empathy induction and effects on prosocial behavior were measured using the empathic dictator game (Klimecki et al., 2016). In line with the above-mentioned research, we expected to find deficits for cognitive and affective empathy in violent offenders. Moreover, based on previous findings (Koenigs et al., 2010; Mayer et al., 2018), we expected to observe less prosocial behavior in violent offenders compared to controls in both versions of the dictator game. Finally, on the basis of prominent theoretical accounts which suggest an important role for psychopathic traits in the emergence of empathic deficits (Blair, 1995; 2001; 2003), we predicted that psychopathic traits should be negatively associated with performances in empathy measures.

2. Methods

2.1. Participants and procedure

42 male violent offenders from a German correctional facility (Justizvollzugsanstalt München) were recruited by the facility's psychologist. Inclusion criteria were: Age of ≥ 18 years, sufficient German language skills, and conviction for violent offenses. Inmates convicted for crimes related to drugs or domestic violence were excluded from participation. The rationale behind the latter exclusion criteria was that domestic violence may represent a type of a (single) violent act that can be driven by highly affective, impulsive responses to relationship/marital conflict. In fact, there is evidence that domestic violent offenders constitute a subgroup that may deviate from other violent offenders in important personality characteristics and the extent of antisocial behavior (Swogger et al., 2007). Furthermore, inmates suffering from schizophrenia were not included in the current study since motives and causation of aggressive behavior is distinctive in this clinical condition. The majority of the sample had been convicted for two or more crimes. The types of crimes committed included assault, robbery, rape, sexual harassment, intent to kill, first degree murder, kidnapping, and assault with lethal consequence. Thirty-four males matched for age and years of education were recruited via advertising and served as control group. One control was excluded due to insufficient language skills. In addition, MASC data of another control person had to be excluded due to multiple answers. The final sample consisted of 42 violent offenders and 33 controls (32 controls for the MASC). The violent offenders were tested in designated rooms within the facility, controls were assessed in the department's laboratory. Trained psychologists from our research group carried out all assessments. Psychiatric disorders were assessed via the *Mini International Neuropsychiatric Interview 6.0.0* (MINI; Ackenheil et al., 1999; Lecrubier et al., 1997).

Participants completed a brief intelligence measure, questionnaires, and the MASC, before they were introduced to the experimental tasks. All participants gave written informed consent and received monetary compensation. The study protocol was approved by the local ethics committee and was conducted in accordance with the Helsinki Declaration.

2.2. Psychological measures

Intelligence was assessed using the *Wiener Matrizen Test 2* (WMT 2; Formann et al., 2011), a non-verbal test based on Raven's Progressive Matrices Test that measures the ability for deductive reasoning and problem solving. The *Self-report Psychopathy Scale III* (SRP-III; Paulhus et al., 2009) assesses psychopathic traits on four subscales:

Interpersonal Manipulation, Callous Affect, Erratic Lifestyle, and *Antisocial Behavior*. Aggressive behavior was measured using the German version of the 29-item *Buss-Perry Aggression Questionnaire* (BPAQ; Buss and Perry, 1992; Herzberg, 2003) comprising four subscales *Physical* and *Verbal Aggression, Anger*, and *Hostility* in addition to the total sum score. Trait empathy was measured with the widely used *Interpersonal Reactivity Index* (IRI; Davis, 1980; Davis, 1983), which includes the subscale *Perspective Taking* assessing cognitive empathy and the subscales *Fantasy, Empathic Concern*, and *Personal Distress* relating to affective components of empathy. The abilities to recognize, understand, and process one's own emotions were assessed using the *Toronto Alexithymia Scale-20* (TAS; Bagby et al., 1994), which consists of three subscales *Identifying* and *Describing Emotions* and *Externally-orientated Thinking* and a total sum score.

2.3. Movie for the assessment of social cognition

To assess cognitive empathy/ToM, the MASC (Dziobek et al., 2006) was employed. This video-based test assesses the capability for a profound understanding of others' thoughts, intentions (cognitive ToM), and feelings (affective ToM) in complex social situations. The movie, in which four actors are having a dinner party, is paused 46 times prompting participants to answer questions about the characters' feelings, thoughts, and intentions. The answering format provides four alternatives of which participants are required to select one. Errors are categorized in two categories: Erroneous answers indicate either insufficient/lacking ToM or exceeding ToM reflecting over-interpretative mental state inferences. Additionally, separate scores for questions relating to cognitive ("what does X think?", 27 items) and affective ("what does X feel?", 18 items) ToM are available (Montag et al., 2010). The task was presented via Microsoft PowerPoint®.

2.4. Empathy induction and the empathic dictator game

The empathy induction and the empathic dictator game were carried out in two separate parts. In part one, participants provided empathy ratings after watching short video sequences of empathy inducing and control videos that were taken from the Socio-affective Video Task (Klimecki et al., 2012). In part two, which started immediately after completion of part one, participants first played one standard dictator game with the instruction to distribute 10 monetary units at any rate between themselves and another, hypothetical player (between 0 and 10 monetary units). Subsequently, they were presented with the same videos, however, instead of providing empathy ratings, they played the empathic dictator game following each video sequence (Klimecki et al., 2016).

2.4.1. Empathy ratings

Participants were told that they would watch short video sequences and were instructed to focus on the mood and feelings of the characters in the videos. Half of the videos were empathy inducing videos depicting suffering others, while the other half were control videos showing people performing everyday activities (for more information on the stimulus set, see Klimecki et al., 2012; Klimecki et al., 2016). Following each of the 44 videos which were presented in randomized order, cognitive empathy and affective empathy were assessed via four questions on an 11 point Likert scale ranging from 0 to 10 (see Table 1). In order to reduce the likelihood of socially desirable answers and to facilitate self-reflection, we chose to assess affective empathy both implicitly and explicitly.

2.4.2. Standard and empathic dictator game

Prior to the second part of the experiment, participants were introduced to the dictator game and completed one standard dictator game scenario with a hypothetical player. Subsequently, participants were introduced to the empathic dictator game. They were told that they would watch the same videos again, but instead of empathy ratings, they would be asked to distribute 10 monetary units at any rate between themselves and the person in the respective video. In addition, all participants were informed that the monetary units kept during the task would be converted into real money and added to their reimbursement. Just like in the empathy task, each trial started with the randomized presentation of one of the 44 videos, but was then followed by the question "How many points do you want to give to the person?" Participants indicated on a scale from 0 to 10 how many monetary units they wanted to share with the person in the respective video. Following the response, a feedback screen indicating the payoffs for both parties appeared for 3000 ms (e.g., "You get 3 points; the other person gets 7 points"; see Fig. 1). The final screen contained information about participants' overall payoffs.

The experiment was programmed using Presentation® software (Neurobehavioral Systems, California, US), version 16.4, and both questionnaires and experimental paradigms were presented on a 15.4-inch WXGA wide TFT LCD laptop.

2.5. Statistical analysis

All statistical analyses were performed using SPSS version 22.0 for Windows (IBM SPSS Statistics, IBM Corporation, Armonk, NY). Demographic and psychological variables between groups were compared with *t* tests for continuous variables. Differences in mental state modality and error categories between groups in the MASC as well as effects of the empathy induction on the four empathy ratings and altruistic sharing behavior were analyzed using separate multivariate analyses of variance (MANOVAs), followed by post hoc univariate ANOVAs. Pearson's correlation coefficients were calculated to investigate possible relationships between MASC scores, ratings for empathy inducing videos and psychopathic traits. In order to test whether the correlation coefficients significantly differ between the two groups we further calculated comparisons based on Fisher's *r-z* transformations.

3. Results

3.1. Participant characteristics

The violent offenders did not differ from controls with respect to demographic variables and intelligence estimate (see Table 2). In the offender sample, two individuals met the categorical criteria for current and three for a lifetime history of depression. Three controls had a lifetime diagnosis of major depression. In addition, five individuals in the offender and one in the control group fulfilled diagnostic criteria for

Table 1
Assessment of empathy.

Facet of empathy	Question and rating scale
Cognitive empathy:	"How did the person in the video feel?"0 (very bad) to 10 (very well)
Affective empathy:	
valence (implicit)	"How comfortable or uncomfortable did you feel while watching the videos?"0 (very uncomfortable) to 10 (very comfortable)
arousal (implicit)	"How intense was the feeling evoked by the video?"0 (not at all intense) to 10 (very intense)
overall (explicit)	"How much empathy did you have?"0 (not empathic at all) to 10 (very empathic)

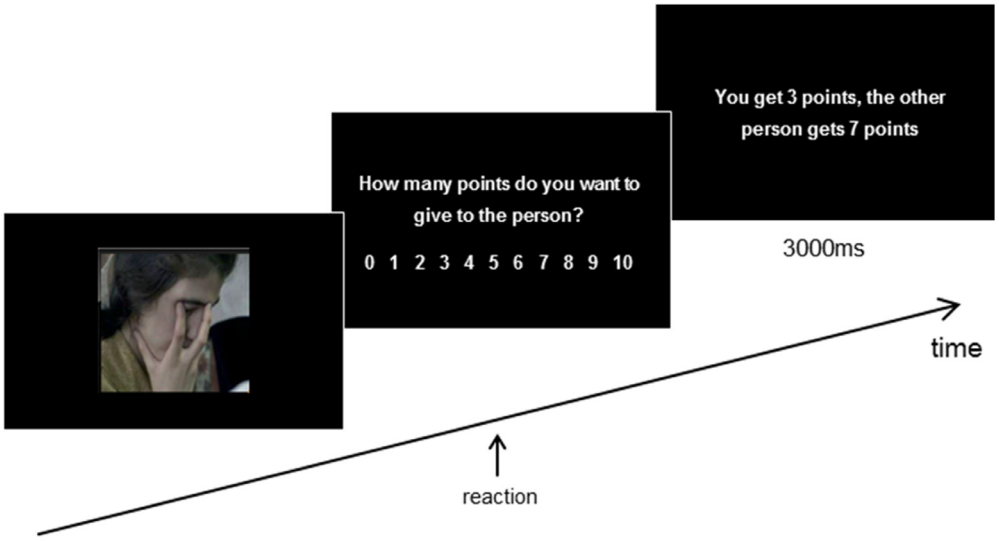

Fig. 1. Exemplary trial of an empathy inducing video in the empathic dictator game.

a substance and/or alcohol dependency as indicated by the MINI. Compared to controls, the violent offenders exhibited significantly higher scores in measures of psychopathy (SRP-III) and aggression (BPAQ), but not for self-reported trait empathy (IRI) or alexithymia scores (TAS). Correlational analyses revealed that psychopathy scores were negatively associated with self-reports of cognitive and affective empathy levels and positively with TAS indices in the offenders (see Table 3).

3.2. MASC performance

In the MASC, groups did not differ with regard to total number of errors ($t_{72} = -0.19$; $p = 0.848$; $\eta^2 < 0.01$; see Supplementary Table 1). In order to investigate potential differences in insufficient/lacking and exceeding ToM, we conducted a MANOVA yielding no significant group effect ($F_{\text{multivariate } 2,\ 71} = 0.48$; $p = 0.618$; $\eta^2 = 0.01$). We also conducted a MANOVA for cognitive and affective ToM subscores, which also revealed no significant group effect ($F_{\text{multivariate } 2,\ 71} = 0.07$; $p = 0.936$; $\eta^2 < 0.01$). Moreover, no correlations with psychopathy scores were found for any of the MASC scores (all $p > 0.096$ for offenders, all $p > 0.230$ for controls).

3.3. Empathy induction and the empathic dictator game

To investigate the effects of the empathy induction on the four empathy ratings (see Supplementary Table 2), we conducted a MANOVA with the between factor group and the ratings as dependent variables (i.e., cognitive empathy, affective empathy: valence, affective empathy: arousal, and affective empathy: overall). Before entering the data into the MANOVA, mean values of control videos were subtracted

Table 2
Sample characteristics and psychological measures.

	Violent offenders ($n = 42$)	Controls ($n = 33$)	Statistics	
Age	32.79 (10.94)	28.82 (10.92)	$t_{73} = -1.56$; $p = 0.123$	$\eta^2 = 0.03$
Education (in years)	9.62 (1.23)	9.79 (0.74)	$t_{68.80} = 0.74$; $p = 0.464$	$\eta^2 = 0.01$
WMT 2 sum score	9.05 (4.39)	7.82 (2.94)	$t_{71.39} = -1.45$; $p = 0.152$	$\eta^2 = 0.03$
SRP-III				
Interpersonal Manipulation	44.02 (7.66)	39.55 (7.34)	$t_{73} = -2.56$; $p = 0.013$	$\eta^2 = 0.08$
Callous Affect	40.57 (6.96)	37.09 (5.41)	$t_{73} = -2.37$; $p = 0.021$	$\eta^2 = 0.07$
Erratic Lifestyle	50.48 (8.91)	42.58 (9.04)	$t_{73} = -3.79$; $p < 0.001$	$\eta^2 = 0.16$
Antisocial Behavior	44.14 (11.13)	29.70 (7.97)	$t_{72.44} = -6.54$; $p < 0.001$	$\eta^2 = 0.35$
Total sum score	179.21 (27.34)	148.91 (20.53)	$t_{72.87} = -5.48$; $p < 0.001$	$\eta^2 = 0.28$
BPAQ				
Physical Aggression	25.38 (7.77)	16.82 (5.65)	$t_{72.62} = -5.52$; $p < 0.001$	$\eta^2 = 0.28$
Verbal Aggression	16.12 (3.42)	14.27 (3.42)	$t_{73} = -2.32$; $p = 0.023$	$\eta^2 = 0.07$
Anger	15.81 (5.76)	12.79 (4.02)	$t_{72.09} = -2.67$; $p = 0.009$	$\eta^2 = 0.08$
Hostility	23.31 (5.70)	22.06 (5.47)	$t_{73} = -0.96$; $p = 0.341$	$\eta^2 = 0.01$
Total sum score	80.62 (18.73)	65.94 (14.34)	$t_{73} = -3.72$; $p < 0.001$	$\eta^2 = 0.16$
IRI				
Perspective Taking	16.33 (4.57)	16.63 (4.72)	$t_{73} = 0.28$; $p = 0.780$	$\eta^2 < 0.01$
Fantasy	15.29 (4.27)	13.24 (5.44)	$t_{73} = -1.82$; $p = 0.072$	$\eta^2 = 0.04$
Empathic Concern	17.12 (3.66)	18.24 (3.12)	$t_{73} = 1.41$; $p = 0.164$	$\eta^2 = 0.03$
Personal Distress	12.67 (4.01)	10.94 (4.23)	$t_{73} = -1.81$; $p = 0.075$	$\eta^2 = 0.04$
TAS				
Identifying Emotions	14.17 (6.10)	12.52 (4.34)	$t_{72.35} = -1.37$; $p = 0.176$	$\eta^2 = 0.02$
Describing Emotions	13.38 (4.46)	13.30 (4.63)	$t_{73} = -0.07$; $p = 0.941$	$\eta^2 < 0.01$
Ext.-Orientated Thinking	20.50 (3.98)	20.06 (3.23)	$t_{73} = -0.51$; $p = 0.609$	$\eta^2 < 0.01$
Total sum score	48.05 (12.04)	45.88 (9.70)	$t_{73} = -0.84$; $p = 0.403$	$\eta^2 = 0.01$

Note: Values are means (standard deviation). WMT 2 = Wiener Matrizen Test 2; SRP-III = Self-report Psychopathy Scale III; BPAQ = Buss-Perry Aggression Questionnaire; IRI = Interpersonal Reactivity Index; TAS = Toronto Alexithymia Scale

Table 3
Correlations between psychological measures and SRP-III scores.

		IRI PT	IRI FS	IRI EC	IRI PD	TAS ID	TAS DE	TAS EO	TAS total
IRI PT	Offenders	–							
	controls								
IRI FS	Offenders	**0.41 (0.007)**	–						
	controls	0.08 (0.662)							
IRI EC	Offenders	**0.55 (< 0.001)**	**0.33 (0.035)**	–					
	controls	0.30 (0.089)	0.18 (0.320)						
IRI PD	Offenders	0.07 (0.641)	0.29 (0.060)	**0.41 (0.007)**	–				
	controls	−0.26 (0.151)	0.19 (0.291)	0–0.08 (0.642)					
TAS ID	Offenders	−0.10 (0.529)	**0.38 (0.014)**	0.09 (0.563)	**0.39 (0.010)**	–			
	controls	−0.07 (0.718)	0.15 (0.419)	0.25 (0.167)	**0.43 (0.013)**				
TAS DE	Offenders	0.01 (0.948)	0.07 (0.667)	−0.14 (0.366)	0.21 (0.193)	**0.53 (< 0.001)**	–		
	controls	−0.31 (0.076)	−0.30 (0.089)	0.00 (0.995)	**0.39 (0.023)**	**0.63 (< 0.001)**			
TAS EO	Offenders	−0.19 (0.221)	0.00 (0.978)	−0.19 (0.221)	0.01 (0.969)	**0.54 (< 0.001)**	**0.47 (0.002)**	–	
	controls	**−0.46 (0.008)**	−0.18 (0.329)	−0.25 (0.167)	**0.38 (0.032)**	0.19 (0.297)	**0.43 (0.014)**		
TAS total	Offenders	−0.11 (0.486)	0.22 (0.166)	−0.07 (0.658)	0.28 (0.076)	**0.88 (< 0.001)**	**0.79 (< 0.001)**	**0.78 (< 0.001)**	–
	controls	−0.33 (0.060)	−0.14 (0.448)	0.03 (0.873)	**0.51 (0.003)**	**0.81 (< 0.001)**	**0.90 (< 0.001)**	**0.62 (< 0.001)**	
SRP total	Offenders	**−0.36 (0.018)**	−0.05 (0.768)	**−0.39 (0.012)**	0.06 (0.719)	**0.44 (0.003)**	0.25 (0.106)	*0.30 (0.051)*	**0.42 (0.006)**
	controls	**−0.39 (0.024)**	0.28 (0.115)	−0.05 (0.783)	0.26 (0.145)	0.12 (0.520)	0.09 (0.611)	0.20 (0.267)	0.16 (0.368)

Note. Values are Pearson correlations (p-values in parenthesis, in bold if $p < 0.05$, italic when significant on trend level) between the indicated measures. BPAQ total = Buss-Perry Aggression Questionnaire, total sum score; IRI PT = Interpersonal Reactivity Index, Perspective Taking scale; IRI FS = Fantasy scale; IRI EC = Empathic Concern scale; IRI PD = Personal Distress scale; TAS ID = Toronto Alexithymia Scale, Identifying Emotions; TAS DE = Describing Emotions; TAS EO = Externally-orientated Thinking; TAS total = total sum score; SRP total = Self-report Psychopathy Scale III, total sum score

Table 4
Correlations between empathy ratings and psychopathy scores.

		Cognitive empathy	Affective: valence	Affective: arousal	Affective: overall	SRP-III total
Cognitive empathy	Offenders	**–**	**0.79 (< 0.001)**	0.18 (0.265)	0.11 (0.504)	0.17 (0.276)
	controls		**0.61 (< 0.001)**	0.10 (0.601)	0.25 (0.166)	0.05 (0.784)
Affective: valence	Offenders	**0.65 (< 0.001)**	**–**	0.20 (0.200)	0.18 (0.247)	0.23 (0.136)
	controls	**0.61 (< 0.001)**		0.18 (0.320)	0.17 (0.336)	0.02 (0.915)
Affective: arousal	Offenders	**0.51 (0.001)**	**0.55 (< 0.001)**	–	**0.90 (< 0.001)**	0.01 (0.973)
	controls	**0.39 (0.027)**	**0.58 (< 0.001)**		**0.95 (< 0.001)**	0.04 (0.809)
Affective: overall	Offenders	**0.46 (0.002)**	**0.51 (0.001)**	**0.91 (< 0.001)**	–	−0.01 (0.935)
	controls	**0.50 (0.003)**	**0.60 (< 0.001)**	**0.80 (< 0.001)**		0.03 (0.866)
SRP-III total	Offenders	−0.19 (0.228)	**−0.35 (0.023)**	**−0.34 (0.027)**	**−0.34 (0.027)**	
	controls	0.03 (0.870)	0.09 (0.612)	0.03 (0.852)	−0.05 (0.775)	

Note. Values are Pearson correlations with p-values in parenthesis (in bold if $p < 0.05$) between the indicated measures for empathy inducing (grey background) and control videos (white background). Ratings of cognitive empathy/ToM and affective empathy: valence were recoded. SRP-III total = Self-report Psychopathy Scale III, total sum score

from empathy inducing videos for all rating questions. Also, two rating questions were recoded for joint analyses (cognitive empathy and affective empathy: valence) in order to adjust scale directions, with high values now uniformly indicating empathic reactions. No significant group effect was observed ($F_{\text{multivariate } 4,\ 70} = 2.01$; $p = 0.103$; $\eta^2 = 0.10$). Finally, correlational analyses revealed a negative association between psychopathy scores and ratings for empathy inducing videos only in the offender group (see Table 4). Coefficients differed between the two groups with regard to affective ($z = -1.89$; $p = 0.029$) but not cognitive empathy ($z = -0.92$; $p = 0.179$).

To examine the effects of the empathy induction on altruistic sharing in the three game settings, we conducted a MANOVA with the between factor group and the game settings as dependent variables (i.e., standard/control videos/empathy induction). Analyses revealed a significant group effect ($F_{\text{multivariate } 3,\ 71} = 3.29$; $p = 0.026$; $\eta^2 = 0.12$) and univariate analyses revealed significant differences in all three game settings (all $p \leq 0.047$; empathy inducing videos: $M = 6.83$; $SD = 2.10$ for offenders vs. $M = 8.08$; $SD = 1.58$ for controls > standard dictator game: $M = 4.12$; $SD = 2.46$ for offenders vs. $M = 5.27$; $SD = 2.45$ for controls > control videos: $M = 2.16$; $SD = 1.58$ for offenders vs. $M = 3.28$; $SD = 1.97$ for controls; see Fig. 2). As psychopathy scores were negatively related to altruistic sharing behavior (standard dictator game: $r = -0.263$, $p = 0.023$; empathic dictator game: $r = -0.383$, $p = 0.001$), and as the correlations between psychopathy scores and altruistic behavior in the three settings of the DG did not differ between violent offenders and controls (all $zs < 1.4$, all $ps > 0.08$), we included psychopathy scores as a covariate in an additional, exploratory analysis and ran the same analyses, which revealed that the group difference was no longer significant ($F_{\text{multivariate } 3,\ 70} = 1.64$; $p = 0.188$; $\eta^2 = 0.07$).

4. Discussion

The aim of the present study was to thoroughly examine empathic competencies on multiple assessment levels and to test whether an experimental empathy induction can increase prosocial behavior in incarcerated violent male offenders. Our results can be summarized as follows: We found no evidence for impaired empathic competencies in offenders as compared to matched controls, neither in self-report ratings, video-based measures (MASC), nor in the sensitivity to the empathy induction. Although offenders exhibited less altruistic behavior than controls, the empathy induction increased prosocial behavior in both groups. Finally, psychopathic traits were associated with a distinct and homogenous pattern of lower self-reported empathy, higher alexithymia scores, an attenuated affective responding following empathy induction, and less altruistic sharing.

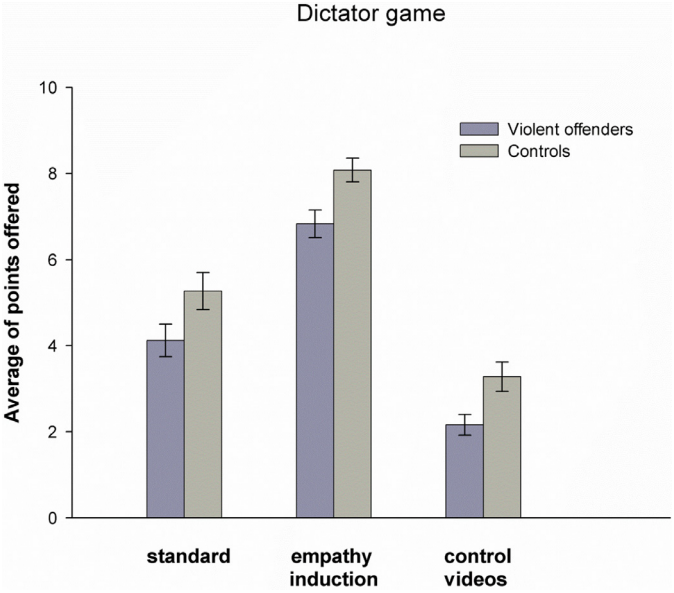

Fig. 2. Mean offer rates in the standard and the empathic dictator game following empathy inducing or control videos (vertical bars represent standard errors of mean). Significant group effects disappeared after including psychopathy scores as a covariate.

4.1. Empathic competencies in violent offenders

A longstanding history of research proposes a link between offending and deficient empathy, arguing that commitment of particularly violent offenses requires blunting or suppression of empathic feelings, which should be automatically elicited due to the immediate and direct contact to the victims (Jolliffe and Farrington, 2004). However, our results indicate unimpaired empathic functioning in violent offenders when compared to carefully matched controls: First, we found comparable levels of self-reported trait cognitive empathy and affective empathy, which is in line with previous data in similar populations applying the IRI (Dolan and Fullam, 2004; Domes et al., 2013; Shamay-Tsoory et al., 2010). Furthermore, no differences in the self-reported ability to identify and describe one's own feelings (alexithymia) were evident in the present study. Additionally, the MASC (Dziobek et al., 2006), which has already been successfully applied in various psychopathologies, such as in bipolar (Montag et al., 2010), depressive (Wolkenstein et al., 2011), and schizophrenic populations (Montag et al., 2011), did not reveal impairments in cognitive empathy/ToM in the violent offenders. Finally, both groups showed higher empathy ratings following empathy inducing as compared to control videos. Thus, violent offenders were clearly able to respond to empathy inducing stimuli which provides additional evidence for intact cognitive and affective empathic competencies in these individuals.

Especially the latter result is surprising in light of the comprehensive body of literature demonstrating impaired facial affect recognition abilities in violent offenders (for review, see Chapman et al., 2018). Thus, the link between basic social cognitive prerequisites and the nature and impact of these deficits on actual overall empathic capabilities and behavioral responding is yet to be determined in future studies.

4.2. Increasing prosocial behavior in violent offenders

On the behavioral level, violent offenders showed less altruistic behavior than controls on all three DG scenarios employed in the current study (standard dictator game, empathic dictator game, and control condition). This is consistent with previous research (Koenigs et al., 2010) and results from our own lab (Mayer et al., 2018) indicating a link between antisociality and attenuated giving behavior. However, it is important to note that despite these differences, the empathy induction lead to a threefold increase of prosocial behavior in violent offenders. Together with the observation of preserved empathic skills, our results suggest that violent offenders are capable of feeling empathy for others in need and can respond to an empathy induction with increased prosocial behavior. These findings are consistent with meta-analytic evidence indicating that the relationship between offending and empathy is negligible (Vachon et al., 2014) and, most importantly, open up promising avenues for the development and implementation of interventions promoting prosocial behavior in violent offenders.

4.3. The role of psychopathic traits in empathic functioning

The current findings suggest a distinct association of psychopathic traits and all modalities of empathic functioning, ranging from self-reported trait empathy and alexithymia to performance-based measures and experimentally induced feelings of empathy. We demonstrated negative correlations between psychopathy scores and self-report data in both cognitive and affective empathy. Furthermore, psychopathy was associated with an attenuated self-reported ability to identify one's own emotions and with externally oriented thinking. Thus, psychopathic traits may not only be related to attenuated empathic competencies towards others, but also to impairments in the ability to understand one's own feelings. Research on associations between alexithymia and psychopathy yielded mixed results, with some findings indicating a positive (Langevin and Hare, 2001; Pham, 1995), and some demonstrating a negative association (Pham et al., 2010). Our results fit well with findings reporting associations between higher alexithymia scores and less altruistic behavior as well as decreased activation in brain regions crucial for empathy (FeldmanHall et al., 2013), which are also discussed to be altered in psychopathy (Glenn et al., 2009; Glenn et al., 2010; Kiehl, 2006; Kiehl et al., 2001; Koenigs, 2012; Ly et al., 2012; Rilling et al., 2007). Building on this initial evidence, future studies are needed in order to understand the link between psychopathy, alexithymia, and empathic responding.

Despite negative associations with self-reported trait empathy, we did not find evidence for an association between a video-based assessment of cognitive empathy/ToM (MASC) and psychopathy. This evidence runs counter the only previous study which investigated this relationship and found some evidence for a link between impaired MASC performance and psychopathy (Sharp and Vanwoerden, 2014). Furthermore, the discrepancy between self-report and performance-based data in our study may be due to differences in perspective: While the questionnaire measures (IRI) assess empathy based on self-related information, that is, first-person perspective (e.g., “I am often quite touched by things that I see happen”), the MASC is based on observations unrelated to participants’ own thoughts and intentions, i.e., third person or observer perspective (“What does Sandra think?” for cognitive ToM or “How does Cliff feel?” for affective ToM). Recently, valid concerns have been raised whether and to which extent social cognition impairments captured from a first- or third-person perspective contribute to real-time interactional difficulties observed in different psychopathologies (Schilbach, 2016). Indeed, recent research also provides first evidence highlighting the importance to delineate possible deficits in empathic responding from self- as well as other-related perspective. For instance, Decety et al. (2013b) reported a divergent activation pattern in psychopathic inmates relative to controls only when instructed to imagine someone else's pain, but neural activation patterns were similar when participants imagined their own pain. Similar findings have been reported for adolescents with psychopathic traits (Marsh et al., 2013) suggesting deficient abilities to feel others’ pain rather than a lack of concern as suggested by Dolan and Fullam (2004). Future studies are needed to systematically investigate empathic responding patterns from different interpersonal perspectives and to determine their relevance for real-time social interactions using more

realistic settings.

Another limitation worth mentioning is the use of self-report measures instead of clinical interviews. Most research on psychopathy applied the revised version of the Psychopathy Checklist as a clinical measure (PCL-R; Hare, 2003). In the present work, however, self-report measures were applied exclusively and group assignment was carried out based on imprisonment and conviction for violent crimes.

Our data show that particularly affective empathy ratings were negatively associated with psychopathy scores following the empathy induction. This is in line with indirect evidence from studies investigating autonomous psychophysiological responses reporting blunted reactivity to others' pain in psychopathic inmates (Blair, 2007; Pfabigan et al., 2015; Seidel et al., 2013). Moreover, the current results corroborate findings on deficient affective empathy in conduct disordered boys with high relative to low psychopathy scores (Schwenck et al., 2012).

Future studies may additionally obtain psychophysiological correlates during the empathic dictator game in order to underpin behavioral findings and interpretations. Furthermore, future studies may also take into account the role of interventions which focus on promoting prosocial behavior being consistent with a strengths-based approach to offender rehabilitation.

5. Conclusion

The current study is unique in that we employed an empathy induction and assessed multiple levels of empathy as well as prosocial behavior in violent offenders. The present findings show no systematic impairments in empathy in violent offenders per se, but negative associations between empathic functioning and psychopathic traits. We also demonstrated that violent offenders were capable of empathic reactions and that it is possible to increase prosocial behavior in this population by means of an empathy induction. Moreover, we found a distinctive pattern of negative associations between empathic responding and psychopathic traits suggesting that treatment programs aiming to improve empathy should be conceptualized to distinct and clearly defined problem areas and psychopathologies.

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Supplementary materials

Supplementary material associated with this article can be found, in the online version, at doi:10.1016/j.psychres.2018.08.035.

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