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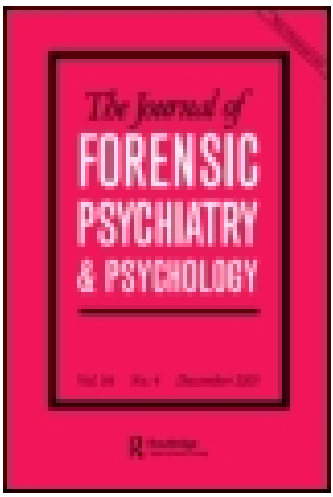

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Implicit attitudes toward violence and their relation to psychopathy, aggression, and socially adaptive behaviors in forensic psychiatric inpatients

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Implicit attitudes toward violence and their relation to psychopathy, aggression, and socially adaptive behaviors in forensic psychiatric inpatients

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In order to investigate the relation between implicit attitudes toward violence and different aspects of violent and social behavior in Dutch forensic psychiatric inpatients, an implicit association test was related to measures of psychopathy, aggression, and socially adaptive behaviors. Results indicated that all patients had negative implicit attitudes toward violence. Although implicit attitudes toward violence were unrelated to several self-report measures of aggression, there was a significant positive relation between these attitudes and the antisocial facet of psychopathy. Furthermore, it was found that implicit attitudes toward violence were significantly negatively associated with coping behaviors and the level of moral awareness, indicating that patients with more negative implicit attitudes toward violence more often reported these behaviors, which can be assumed to inhibit aggression. As the present study was only correlational in nature, our findings need to be further explored in prospective research.

Keywords: violence; forensic psychiatric inpatients; attitudes; implicit association test

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Introduction

According to Eagly and Chaiken (1993), an attitude can be described as 'a psychological tendency that is expressed by evaluating a particular entity with some degree of favor or disfavor' (p. 1). In a similar vein, Olson and Fazio (2009) have defined an attitude as 'an association in memory between an object and one's evaluation of it' (p. 20). Although these definitions of attitudes somewhat differ, both seem to focus on the extent to which a psychological object, such as behavior, is evaluated as positive or negative (see Eagly & Chaiken, 2007, for a comprehensive overview).

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Attitudes are assumed to be important determinants of behavior (Ajzen & Fishbein, 1977, 2000; Allport, 1954), including violent behavior (e.g. Anderson & Bushman, 2002; Anderson & Huesmann, 2007; Dodge, 1993; Kraus, 1995). A more positive attitude toward a particular type of behavior increases the likelihood that such behavior is performed, whereas a more negative attitude may result in the inhibition of that behavior. Anderson and Bushman (2002) stated that more positive attitudes toward violence against certain groups of people can prompt a person to become aggressive toward these people. For example, positive attitudes toward violence against women are assumed to be associated with the perpetration of aggressive acts against women (Flood & Pease, 2009). As a result, criminal attitudes, such as positive attitudes toward violence, are assumed to be among the most important criminogenic factors in the risk-need-responsivity model of offender rehabilitation (Andrews & Bonta, 2003, 2010; Bonta & Andrews, 2007), and are often targeted in rehabilitation programs for violent offenders (Polaschek, 2006).

Several studies that applied self-report questionnaires for assessing attitudes have indicated that positive attitudes toward violence are associated with a heightened frequency of overt violent behaviors (e.g. Connolly, Friedlander, Pepler, Craig, & Laporte, 2010; Markowitz, 2001; Vernberg, Jacobs, & Hershberger, 1999). For instance, Markowitz (2001) found that self-reported attitudes toward violence against spouses and children were related to the frequency of overt violent behavior against these family members. However, the use of self-report assessment has limitations when studying negatively valenced attitudes, and this is especially true for samples of offenders. Questionnaires – such as the Velicer Attitudes Toward Violence Scale (Velicer, Huckel, & Hansen, 1989) and the Attitudes Toward Dating Violence Scales (Price et al., 1999) – probably depend on the respondents' ability for introspection (Nunes, Firestone, & Baldwin, 2007) and also may be vulnerable to social desirable response tendencies (e.g. Gannon, Ward, & Collie, 2007; Vigil-Colet, Ruiz-Pamies, Anguiano-Carrasco, & Lorenzo-Seva, 2012). Various studies have demonstrated that explicit measures are only predictive of consciously carried out behaviors under conditions in which both sufficient cognitive resources and the motivation to act according to the explicit attitude are present (e.g. Friese, Hofmann, & Schmitt, 2009). If these conditions are not met, individuals show impulsive behaviors that are not in line with their explicitly reported attitudes but more related to their implicit attitudes (Fazio, 1990; Gawronski & Bodenhausen, 2006; Olson & Fazio, 2009; Strack & Deutsch, 2004).

Implicit attitudes can be described as automatically and unintentionally activated evaluative associations with a psychological object (Gawronski & Bodenhausen, 2006) and can be assessed with implicit measures (Greenwald, Poehlman, Uhlmann, & Banaji, 2009) such as the implicit association test (IAT; Greenwald, McGhee, & Schwartz, 1998). This test is a reaction time-based categorization task that measures the strength of the implicit association between concepts in memory. Several studies have supported the validity of

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the IAT in the assessment of patients showing violent or otherwise aggressive behavior, indicating that more positive implicit attitudes toward violence are associated with higher levels of violent behavior. For example, a study by Eckhardt, Samper, Suhr, and Holtzworth-Munroe (2012) showed that male offenders involved in domestic violence had more positive implicit associations toward violence than non-violent men, whereas no difference between both groups was found on explicit attitudes toward violence. These results made the authors conclude that 'aggressogenic attitudes are likely to operate automatically and with little conscious deliberation' (Eckhardt et al., 2012, p. 472).

A more positive attitude toward violence has also been associated with psychopathy (e.g. Blair, 2004; Olanrewaju, Dominic, Julius, & Funmilola, 2014; Snowden, Gray, Smith, Morris, & MacCulloch, 2004), which is considered to be an important construct in forensic psychiatry because of its relation with aggressive behavior (Hare & Neumann, 2008, 2009; Hildebrand, Hesper, Spreen, & Nijman, 2005). Studies have shown that offenders with relatively high levels of psychopathic traits are more inclined to display both reactive and proactive aggressive behaviors (Cornell et al., 1996; Woodworth & Porter, 2002). According to the integrated emotions system (IES) model of Blair (2004), the aggressive behavior of psychopaths may be related to impairments of the amygdala and orbitofrontal cortex. The impairment of the amygdala results in the inability to recognize and respond to emotions of distress in their victims. As a result, aversive conditioning of their harmful behavior will not occur, causing the psychopathic offender to regard aggression as less aversive (Blair, 1995; Patil, 2015; Rothemund et al., 2012). To our knowledge, only one study has been conducted exploring the relationship between implicit attitudes toward violence and psychopathy in an offender sample. This study (Snowden et al., 2004) found that murderers who scored high on the Psychopathy Checklist-Revised (PCL-R; Hare, 1991, 2003) indeed displayed more positive implicit attitudes toward violence, as measured by the IAT. However, no significant link between the IAT and psychopathy was found for offenders who had committed other crimes than murder. Nevertheless, in line with the IES model, Snowden et al. (2004) concluded that (aggressive) psychopaths on an implicit level less often link negative consequences to their violent behavior and as such display a more positive attitudes toward violence.

In summary, research on implicit and explicit attitudes toward violence in violent offenders has yielded interesting results, and such information may lead to a better insight in the role of attitudes in the onset and continuation of violent behavior. In the present study, implicit attitudes toward violence were measured by means of the IAT in Dutch violent forensic psychiatric inpatients and then related to indices of psychopathy, aggression, and hostility. In addition, it was examined whether implicit attitudes toward violence have incremental value over other relevant variables that were assessed via self-report questionnaires in the prediction of aggression. Finally, the relation between implicit attitudes toward violence and socially adaptive behaviors was also explored.

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These behaviors included moral awareness, social skills, and coping behaviors, and are often considered as targets in treatment programs for violent offenders because of their inhibitory influence on aggressive behavior (Goldstein, Glick, & Gibbs, 1998; Hornsveld, 2004a, 2004b; Polaschek, 2006). It was hypothesized that more positive implicit attitudes toward violence would be related to higher levels of psychopathy (Snowden et al., 2004), aggression (Eckhardt et al., 2012), hostility and anger (Dodge, 1993). Further, implicit attitudes toward violence were expected to be negatively related to moral awareness and other socially adaptive behaviors such as social skills and adaptive coping behavior.

Method

Participants

The study was carried out in a sample of 110 male forensic psychiatric inpatients, who were detained under hospital order for a serious violent offence. 'Detained under hospital order' means that the court has established a relation between a psychiatric disorder, on the one hand, and the committed offense, on the other (e.g. van Marle, 2002). The primary diagnosis of 82 patients was a cluster B personality disorder on Axis II of the Diagnostic and Statistical Manual of Mental Disorders (DSM-IV-TR; American Psychiatric Association, 2000). Most of these patients had an antisocial personality disorder (44 patients), followed by a cluster B personality disorder not otherwise specified (27 patients), a borderline personality disorder (7 patients), and a narcissistic personality disorder (4 patients). Furthermore, 18 patients had a chronic psychotic disorder on Axis I as their main diagnosis, in combination with a cluster B personality disorder on Axis II, whereas five patients had a (chronic) psychotic disorder and did not meet the DSM-IV-TR criteria for a personality disorder. The psychiatric condition of the patients with a psychotic disorder had been stabilized at the time of the study. Finally, five patients met the DSM-IV-TR criteria for pedophilia. All patients were classified by experienced psychiatrists after an extensive evaluation that included various clinical and psychological evaluations. The mean age was 38.17 years (SD = 9.12; range = 22–59 years). In terms of the committed offenses, 26 patients had been convicted for (attempted) manslaughter, 24 for (attempted) rape, 20 for pedophilic offenses, 11 for theft with violence, 11 for assault, 10 for (attempted) murder, 3 for sexual harassment, 3 for arson, and 2 for threats with violence.

Measures

Implicit associations

The *IAT* (Greenwald et al., 1998) can be used to assess the strength between targets and attributes in memory, and has been applied in numerous studies

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including various forensic populations (e.g. Eckhardt et al., 2012; Gray, Brown, MacCulloch, Smith, & Snowden, 2005; Hempel, Buck, Goethals, & van Marle, 2013; Kanters et al., 2014; Snowden et al., 2004; Van Leeuwen et al., 2013). During this computerized task, patients have to assign target stimuli (either a word or a picture) as quickly as possible to the appropriate target by pressing a left or a right button. The target stimuli are presented in the center of the computer screen, whereas the attribute and target labels are shown in the upper left corner and the upper right corner of the screen. Categorization performance is assumed to be faster and more accurate when the two categories that share a response key are associated (e.g. flower-peasant and insect-unpleasant), as compared with a condition in which they are not associated (e.g. flower-unpleasant and insect-pleasant). For the present study, two different IAT versions were used: a standard valence IAT and a violence-pleasant IAT. The standard valence IAT was included as an experimental control procedure. That is, the standard valence IAT scores were also correlated with the external measures, but no significant correlations were expected. For the standard valence IAT, the target categories were flowers vs. insects, and the attribute categories were pleasant vs. unpleasant. The target categories consisted of eight pictures of flowers and eight pictures of insects. The attribute categories consisted of eight pleasant words (e.g. beautiful; see Appendix 1) and eight unpleasant words (e.g. accident). For the violence-pleasant IAT, the target categories were violence vs. peace, and the attribute categories were pleasant vs. unpleasant. Target categories consisted of eight violence words (e.g. attack) and eight peace words (e.g. calm). The words of the target and attribute categories of the valence IAT and the violence-pleasant IAT were Dutch translations of the stimulus words that were also used in the study of Snowden et al. (2004). During translation, it was taken into account that the average length of the words in categories was similar for various categories.

In total, participants had to complete seven blocks for each IAT. Blocks 1 and 2 were practice blocks to familiarize with the IAT procedure. In blocks 3 and 4, the *congruent* condition was assessed. During this condition, the left button was the correct response for the concept pairs flowers-pleasant (valence IAT) and peace-pleasant (violence-pleasant IAT), whereas the right button was the correct response for the concept pairs insects-unpleasant and violence-unpleasant. Block 5 was again a practice block to make participants familiar with the *incongruent* condition. During blocks 6 and 7, the *incongruent* condition was assessed. During this condition, the left button was the correct response for the concept pairs insects-pleasant (valence IAT) and violence-pleasant (violence-pleasant IAT), whereas the right button was the correct response for the concept pairs flowers-unpleasant and peace-unpleasant. During blocks 1, 2, 3, 5, and 6, each stimulus was presented once in a random order. During blocks 4 and 7, every stimulus was presented twice in pseudorandom order (all stimuli were presented once before they were presented again).

Psychopathy

The *PCL-R* (Dutch version: Vertommen, Verheul, De Ruiter, & Hildebrand, 2002; Hare, 1991, 2003) is a checklist used to assess the level of psychopathy. The checklist consists of 20 items, which have to be rated on a three-point scale with 0 = 'does not apply,' 1 = 'applies to some extent,' and 2 = 'applies.' Vertommen et al. (2002) found support for the reliability of the Dutch version of the PCL-R in a group of 1192 inmates. Cronbach's α was .87, and the average inter-item correlation was .25. In the present study, we used the total score as well as the four-facet structure (Hare, 2003; Hare & Neumann, 2006; Zwets, Hornsveld, Neumann, Muris, & Van Marle, 2015), which measures the following facets of psychopathy: interpersonal (e.g. 'grandiose self-worth'), affective (e.g. 'callous and lack of empathy'), lifestyle (e.g. 'impulsivity'), and antisocial (e.g. 'juvenile delinquency'). In a recent study, a good inter-rater reliability for the PCL-R was demonstrated (ICC = .81; 95% CI = .67–.89; Zwets et al., 2015).

Aggression, anger, and hostility

The *Reactive-Proactive Aggression Questionnaire* (RPQ; Cima, Raine, Meesters, & Popma, 2013; Raine et al., 2006) is a self-report questionnaire to assess reactive and proactive aggression. The RPQ consists of 23 items: 11 items measuring reactive aggression (e.g. 'reacted angrily when provoked') and 12 items measuring proactive aggression (e.g. 'hurt others to win a game'). Respondents are instructed to rate for each item how often they exhibited this behavior in the past using a three-point scale: 0 = 'Never', 1 = 'Sometimes', and 2 = 'Often.' Cima et al. (2013) found good internal consistency for the reactive aggression (α = .83) and the proactive aggression subscale (α = .87).

The *Aggression Questionnaire-Short Form* (AQ-SF; Bryant & Smith, 2001; Dutch version: Hornsveld, Muris, Kraaimaat, & Meesters, 2009) is a shortened version of the aggression questionnaire of Buss and Perry (1992) and contains 12 items that can be allocated to four subscales, that is, physical aggression (e.g. 'Once in a while I can't control the urge to strike another person'), verbal aggression (e.g. 'My friends say that I'm somewhat argumentative'), anger (e.g. 'I have trouble controlling my temper'), and hostility (e.g. 'Other people always seem to get the breaks'). Respondents have to rate the items using a five-point scale ranging from 1 = 'Entirely disagree' to 5 = 'Entirely agree.' In a group of 208 violent forensic psychiatric outpatients, Hornsveld et al. (2009) found that the internal consistency (Cronbach's α) of the AQ-SF total score and subscale scores was .72, .52, .38, .60, and .69, respectively.

Socially adaptive behaviors

The *Inventory of Interpersonal Situations* (IIS; van Dam-Baggen & Kraaimaat, 1999) assesses the level of anxiety people experience during social interactions

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(social anxiety) and how often they are able to actually perform the described behavior in such situations (social skills). In the present study, only the social skills scores were collected. For the social skills questions, a five-point Likert scale is used ranging from 1 = 'I never do' to 5 = 'I always do.' The five subscales are as follows: giving criticism, asking attention for your opinion, giving compliments, initiating contact, and appreciating yourself. van Dam-Baggen and Kraaimaat (1999) demonstrated good internal consistency for this scale (Cronbach's $\alpha = .93$) in a non-clinical sample.

The *Utrecht Coping Scale* (UCL; Schreurs, Van de Willige, Brosschot, Tellegen, & Graus, 1993) assesses several aspects of coping behavior. The respondent has to answer 47 items about specific coping behavior on a four-point Likert scale ranging from 1 = 'Seldom or never' to 4 = 'Very often.' For the present study, we applied the six subscales that referred to positive coping: active problem solving, palliative response, avoidance, seeking social support, expression of emotions, and reassuring thoughts. One subscale, passive response, was considered as dysfunctional coping behavior and was not included in this study. In a non-clinical group of 1200 adults, Schreurs et al. (1993) found internal consistency (Cronbach's α) coefficients to range between .64 and .82 for various subscales of the UCL.

The *Sociomoral Reflection Measure-Adapted Version* (SRM-AV; Hornsveld, Kraaimaat, & Zwets, 2012) assesses the level of moral awareness. The questionnaire contains 20 propositions that have to be answered on a five-point Likert scale ranging from 1 = 'Very unimportant' to 5 = 'Very important.' Furthermore, respondents have to write down why they justify their opinion. These answers are evaluated by a research assistant on a seven-point scale ranging from 1 = 'phase 1: unilateral and physicalistic' to 7 = 'phase 4: systematic and standard.' The SRM-AV consists of four subscales: expecting decent behavior of others, addressing others with regard to their behavior, exhibiting decent behavior to others, and being helpful to others. Hornsveld et al. (2012) found an internal consistency (Cronbach's α) of .94 in a group of 132 forensic inpatients.

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Data handling, preparation, and analyses

All collected data were anonymously processed by a research assistant. A total of 110 patients completed the IAT. Not all self-report questionnaires were fully completed, probably because patients had limited motivation or because they did not fully understand some items of the scales. Data of the incomplete questionnaires were removed from the data-set. Therefore, only 60 SRM-AV scores could be used because the written responses were often incomplete or too ambiguous to make a valid judgment.

For the IAT, trials with latencies above 10,000 ms were deleted from the data-set. Furthermore, the data of participants who had latencies below 300 ms on more than 10% of the trials were deleted, together with the data of patients

who had a total error rate above 25% (error rate of all blocks). Nine patients had an error percentage of 25% or higher on the violence-pleasant IAT and were therefore excluded from the analyses. Furthermore, one patient had response latencies below 300 ms on more than 10% of the trials of the violence-pleasant IAT and was also excluded from the analyses. The removal of these patients resulted in a total sample of 100 patients.

For the valence IAT and the violence-pleasant IAT, D-scores, which represent the IAT-effect, were calculated by expressing the difference between the mean latency of the congruent condition and the incongruent condition in terms of the pooled latency variance (Greenwald, Nosek, & Banaji, 2003). Before this analysis was conducted, errors were replaced with the mean latencies of that block together with a 600-ms penalty.

For the valence IAT, a positive D-score indicates that the flower-unpleasant and insect-pleasant association is stronger than the flower-pleasant and insect-unpleasant association. For the violence-pleasant IAT, a positive D-score indicates that the violence-pleasant and peace-unpleasant association is stronger than the violence-unpleasant and peace-pleasant association. In order to examine the relation between D-scores and the external measures, a correlational approach was applied which can be considered as appropriate for analyzing these cross-sectional data, although this method has the limitation that no conclusions on cause-effect relations can be drawn. Furthermore, multiple regression analyses were conducted to explore unique correlates of aggression and implicit attitudes toward violence scores. All scales had acceptable skewness and kurtosis values and could therefore be judged as having a normal distribution (with the exception of SRM-AV subscale 'Addressing others with regard to their behavior,' which had a kurtosis value of 2.7).

Procedure

The present study was approved by the scientific research committee of Forensic Psychiatric Center De Kijvelanden. All patients completed an informed consent form in which they were explicitly told that cooperation was on a voluntary basis and that the test results would not have any influence on their treatment. The IAT and self-report questionnaires were administered individually by an experienced research assistant. Furthermore, PCL-R (Hare, 1991) scores were collected from the database of FPC De Kijvelanden. Participation was rewarded with a monetary compensation of 15 euros.

Both IAT versions were run using E-Prime 2.0 software on an Apple Macbook Pro 17-inch 2.53-GHz LED backlit widescreen notebook. An E-Prime PST Serial Response Box was used to collect the responses of the participants. Latencies and errors were registered for all trials and were analyzed using the Statistical Package for the Social Sciences, version 20.0.

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Results

IAT-effects

On the valence IAT, an average D-score of −.86 (SD = .39; see Figure 1) was found. This score was significantly lower than 0 [one-sample t (99) = 22.12, $p < .01$], which indicates that patients had a stronger flower-pleasant (and insect-unpleasant) association than a flower-unpleasant (and insect-pleasant) association. No significant correlations were noted to be observed between the standard valence IAT D-score and any of the external measures, implying that significant correlations between the violence-pleasant IAT and external measures cannot be simply attributed to an artifact assessed using the IAT procedure (Table 1).

On the violence-pleasant IAT, an average D-score of −1.19 was found (SD = .27; range = −1.75 to −.46). This score was significantly lower than 0 [one-sample t (99) = 44.65, $p < .01$], which means that the patients had a stronger violence-unpleasant (or peaceful-pleasant) association than a violence-pleasant (or peaceful-unpleasant) association.

Relations between violence-pleasant IAT, psychopathy, and aggression

Table 2 shows the Pearson correlations between the violence-pleasant IAT D-score, on the one hand, and the PCL-R (psychopathy), RPQ (reactive and proactive aggression), and AQ-SF (physical aggression, verbal aggression, anger, and hostility), on the other hand. Only the antisocial facet of the PCL-R (Hare, 2003; Hare & Neumann, 2006) was significantly positively correlated to the IAT D-score ($r = .26$). Furthermore, the IAT D-score was significantly

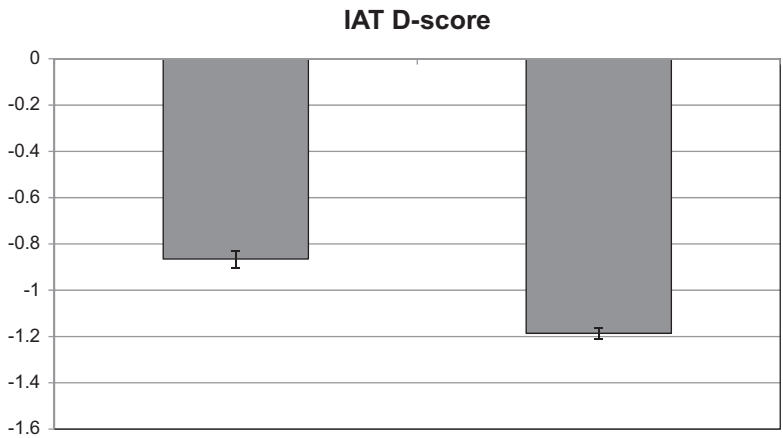

Figure 1. Mean D-scores and standard errors on the standard valence IAT (flowers-unpleasant/insects-pleasant) and the violence IAT (violence-pleasant/peace-unpleasant).

Table 1. Diagnoses of patients.

Disorder	*n*
Patients with a personality disorder	82
Antisocial personality disorder	44
Borderline personality disorder	7
Narcissistic personality disorder	4
Personality disorder not otherwise specified with cluster B traits	27
Patients with a chronic psychotic disorder and a personality disorder	18
Patients with a chronic psychotic disorder	5
Patients with a pedophilic disorder	5

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Table 2. Pearson correlations between violence-pleasant IAT D-scores and measures of psychopathy and aggression.

		Violence-Pleasant association	
Checklist or questionnaire	Factor/Subscale	*n*	*r*
PCL-R	Total	99	.09
	Interpersonal	99	.01
	Affective	99	.03
	Lifestyle	99	.05
	Antisocial	99	.26*
RPQ	Reactive aggression	71	.09
	Proactive aggression	71	.07
AQ-SF	Physical	92	.13
	Verbal	92	.04
	Anger	92	.08
	Hostility	92	.24*

Notes: PCL-R = Psychopathy checklist-revised, RPQ = Reactive proactive aggression questionnaire, AQ-SF = Aggression questionnaire-short form.
*$p < .05$ (two-tailed).

positively correlated to the hostility subscale of the AQ-SF ($r = .24$). These results indicate that patients who have more positive implicit attitudes toward violence tend to have higher scores on the antisocial facet of the PCL-R and report higher levels of hostility. No further significant correlations were found between the IAT D-score and measures of aggression (AQ-SF and RPQ).

To determine the unique contribution of implicit associations toward aggression in predicting aggressive behavior, a multiple regression analysis was conducted in which the antisocial facet of the PCL-R, which is a measure of the antisocial behavior pattern, was predicted from the IAT D-score and a number of other variables that showed a significant bivariate correlation with this self-report of aggression ($p < .10$). As shown in Table 3, only RPQ Proactive

Table 3. Main results of the multiple regression analysis predicting antisocial behavior (PCL-R Antisocial facet) from implicit attitudes toward violence (IAT), and self-reported aggression (AQ-SF; RPQ).

Questionnaire	Subscale	β (SE)	p
IAT	Violent-Pleasant	−.65 (1.24)	.55
AQ-SF	Total aggression	.05 (.04)	.25
RPQ	Reactive	−.00 (.11)	.99
	Proactive	1.97 (.08)	.02

Notes: PCL-R = Psychopathy checklist-revised, IAT = Implicit association test, AQ-SF = Aggression questionnaire-short form, RPQ = Reactive proactive aggression questionnaire, $R^2 = 20$.

aggression made a significant contribution to the regression model, whereas the IAT D-score, AQ-SF Total aggression, and RPQ Reactive aggression did not.

Relations between IAT-effects and socially adaptive behaviors

Table 4 shows the correlations between the IAT D-score, on the one hand, and the IIS (self-reported social skills), UCL (coping behavior), and SRM-AV (moral awareness), on the other hand. A non-significant negative correlation was found between the IAT D-score and the IIS total score ($r = -.20$, $p = .06$), although the subscale giving someone a compliment ($r = -.26$) was significantly correlated to the IAT D-score. These results suggest that patients who

Table 4. Pearson correlations between violence-pleasant IAT D-scores and socially adaptive behaviors.

		Violence-Pleasant association	
Questionnaire	Subscale	N	r
IIS	Social skills	90	−.20
UCL	Active coping	73	−.38**
	Palliative coping	73	−.36**
	Avoidance	73	−.22
	Social support	73	−.19
	Expression of emotions	73	−.08
	Reassuring thoughts	73	−.27*
SRM-AV	Moral awareness	55	−.40**
	Expecting decent beh.	55	−.23
	Addressing others	55	−.23
	Exhibiting decent beh.	55	−.37**
	Being helpful	55	−.29*

Notes: IIS = Inventory of interpersonal situations, UCL = Utrecht coping scale, SRM-AV = Sociomoral reflection measure-adapted version.
*$p < .05$; **$p < .01$ (two-tailed).

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Table 5. Main results of the multiple regression analysis predicting implicit attitudes toward violence (IAT) from social behavior (IIS), Coping behaviors (UCL), and Moral awareness (SRM-AV).

Questionnaire	Subscale	β (SE)	p
IIS	Social behavior	.00 (.00)	.70
UCL	Active coping	−.02 (.01)	.03
	Palliative response	−.01 (.01)	.55
	Reassuring thoughts	−.00 (.02)	.79
SRM-AV	Moral awareness	−.01 (.00)	.02

Notes: IIS = Inventory of interpersonal situations, UCL = Utrecht coping scale, SRM-AV = Sociomoral reflection measure-adapted version, $R^2 = .30$.

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have more negative implicit attitudes toward violence more often display this socially adaptive behavior. For coping behavior, significant correlations were found between the IAT D-score and the active coping subscale ($r = -.38$), the palliative reaction subscale ($r = -.36$), and the reassuring thoughts subscale ($r = -.27$), showing that patients who have more negative implicit attitudes toward violence report to apply these coping behaviors more often. Finally, the IAT D-score was significantly correlated to moral awareness as indexed by the SRM-AV total score ($r = -.40$) and two of its four subscales, namely exhibiting decent behavior to others ($r = -.37$) and being helpful ($r = -.29$). These findings indicate that patients who have more negative implicit attitudes toward violence display higher levels of moral awareness.

A multiple regression analysis was conducted to examine the relative contribution of all socially adaptive behaviors that were in the bivariate analysis associated with implicit attitudes toward violence ($p < .10$). As shown in Table 5, this analysis revealed that only UCL active coping and the SRM-AV total score made independent and significant contributions.

Discussion

The present study assessed implicit attitudes toward violence in a sample of 110 Dutch forensic psychiatric inpatients and their relation with measures of aggression and socially adaptive behaviors. Results showed that, in general, forensic patients had a negative violence-pleasant IAT score, which implies that patients on the whole had negative implicit attitudes toward violence. This is in line with previous studies that applied a violence-related IAT in offender populations (e.g. Eckhardt et al., 2012; Snowden et al., 2004). More positive implicit attitudes toward violence were associated with higher scores on the antisocial facet of psychopathy and self-reported hostility but unrelated to other indices of aggression and psychopathy facets. Furthermore, more negative implicit attitudes toward violence were found to be associated with socially

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adaptive behaviors, which are thought to inhibit the occurrence of aggression, namely prosocial behavior, positive coping behaviors, and moral awareness.

It was further hypothesized that psychopathy, as measured with the PCL-R (Hare, 1991, 2003) total score, would be related to more positive implicit attitudes toward violence because of deficits in aversive conditioning to aggressive behavior (Blair, 2004). However, in the present study, the implicit attitudes toward violence were not significantly related to the PCL-R total score. This is not consistent with results obtained in a study of Snowden et al. (2004), who documented a significant relation between the PCL-R and more positive implicit attitudes toward violence. Although these findings may indicate that the relation between psychopathy and relatively positive implicit attitudes toward violence may be less strong than assumed, these inconsistent findings may well have to do with sample differences. That is, the Snowden et al. study observed the link between general psychopathy and positive implicit attitudes toward violence in a subsample of (attempted) murderers, whereas the subsample of (attempted) murderers in the present study was too small to conduct a comparative analysis. Furthermore, most patients in the present study had an antisocial personality disorder or a personality disorder not otherwise specified with antisocial traits. These disorders are often characterized by a lack of remorse (American Psychiatric Association, 2000), which is assumed to be related to limited aversion to violence (e.g. Gleichgerrcht & Young, 2013).

In the current study, a significant relation did emerge between the PCL-R antisocial facet and the violence-pleasant IAT score. This finding indicates that patients who more clearly displayed an antisocial behavior pattern tended to show more positive implicit attitudes toward violence, which is in line with several other studies that have documented a link between positive attitudes toward violence and the likelihood to display actual violent behavior (Polaschek, Ward, & Hudson, 1997; Slaby & Guerra, 1988). However, a multiple regression analysis showed that self-reported proactive aggression was the only unique predictor of the antisocial facet, whereas the violence-pleasant IAT was not a meaningful addition to this model.

More positive implicit attitudes toward violence were found to be associated with higher levels of self-reported hostility. This relation was anticipated, as attitudes toward violence are assumed to be related to a tendency to focus on hostile aspects of social situations, thereby preparing someone to become aggressive (Dodge, 1993). Furthermore, hostility is typically associated with various aspects of aggression (e.g. Kaufmann, 1970; Smith, 1994; Tanzer, Sim, & Spielberger, 1996). For example, Smith (1994) described hostility as ‘a devaluation of the worth and motives of others, an expectation that others are likely sources of wrongdoing, a relational view of being in opposition toward others, and a desire to inflict harm or see others harmed’ (p. 26).

In contrast with our expectations, no significant relations were found between implicit attitudes toward violence and self-report measures of aggressive behavior. One explanation for this lack of association could be that the

IAT and self-report measures of aggression tap into different processes. The IAT may be more a measure of automatic behavior, whereas a self-report scale assesses explicit and controlled behavior in situations where behavior is self-regulated (Greenwald et al., 2009; Strack & Deutsch, 2004). Furthermore, as mentioned previously, an alternative explanation might be that self-report questionnaires of aggression are more susceptible to socially desirable response tendencies and depend on the motivation and capacity for introspection (Gannon et al., 2007). Note also that similar results have been found in other studies that explored the relation between the violence-related IAT and self-report instruments of aggression (Polaschek, Bell, Calvert, & Takarangi, 2010; Uhlmann & Swanson, 2004).

Besides psychopathy and aggressive behavior, we also included indices of socially adaptive behavior in our study. Interestingly, more negative implicit attitudes toward violence were related to several positive coping behaviors (UCL) and a heightened frequency giving someone a compliment (IIS). Furthermore, more negative implicit attitudes toward violence were also associated with heightened levels of moral awareness, in particular with the tendency to exhibit decent behavior to others. This relation also makes sense as persons with a more developed sense of morality are more likely to display more negative attitudes toward violence (Funk, Baldacci, Pasold, & Baumgardner, 2004).

The present study suffers from a number of limitations. First, it should be noted that the D-scores were composed of both violence-pleasant and peace-unpleasant associations. Therefore, during the IAT-test, the tendency to consider violence as pleasant seems also to be influenced by one's preference for peace. Second, as the present sample of male forensic psychiatric inpatients participated on a voluntary basis, self-selection bias may have occurred. Therefore, the results may not be fully representative of the total population of forensic psychiatric inpatients in the Netherlands. Third, the sample size was relatively small, so it was not possible to make comparisons between subgroups of patients based on their offense or diagnosis or to make any definitive conclusions. Fourth, not all patients completed all questionnaires, indicating that they were probably not equally motivated or not able to report on the constructs that were assessed this way. Fifth, the relatively large number of correlational analyses may have increased the probability of a type I error to occur. Finally, we did not include an observational measure of aggression (e.g. behavioral observations) but solely relied on self-report.

The results of the present study indicate that implicit attitudes toward violence are less clearly connected to self-reported violent behavior but are more likely linked to socially adaptive behavior that may be preventive of aggressive behavior. Interestingly, the promotion of social skills and morality is often a treatment objective in programs for aggressive offenders (e.g. Goldstein et al., 1998; Hornsveld, 2004a, 2004b; Polaschek, 2006). These results might also have clinical implications, although the correction of such attitudes is often hard to accomplish (Bohner & Dickel, 2011). Nevertheless, several interventions

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such as persuasion techniques (Briñol, Petty, & McCaslin, 2009; Tormala, Briñol, & Petty, 2004) and evaluative conditioning (repeated pairing of an attitude object with positive or negative stimuli; Bohner & Dickel, 2011; Olson & Fazio, 2006) have been proposed to be beneficial in changing these implicit attitudes and may eventually have an effect on the onset and persistence of violent behavior, especially in situations when impulses take over and behavior is assumed to be guided by positive implicit attitudes toward violence (Strack & Deutsch, 2004). However, there are also several indications that these treatment methods do not apply to patients with high levels of psychopathy, as they benefit less from aversive conditioning (Flor, Birbaumer, Hermann, Ziegler, & Patrick, 2002), because of impairments of the amygdala (Blair, 2004).

The present study found indications that negative attitudes implicit toward violence are especially related to socially adaptive behaviors and the antisocial facet of psychopathy and hostility. Other relations with self-report measures of anger and aggression were not significant. In order to get more insight in the precise role of implicit attitudes toward violence in the onset and continuation of violent behavior, future studies should be conducted to investigate whether the IAT is prospectively related to aggressive and violent behavior. Further, although several studies have demonstrated the validity of the IAT (e.g. Eckhardt et al., 2012; Nunes, Hermann, & Ratcliffe, 2013), more studies are required to confirm its clinical and diagnostic usefulness.

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Disclosure statement

No potential conflict of interest was reported by the authors.

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Appendix 1. Words used for the pleasant-unpleasant category and the peace-violence category

Pleasant words	**Unpleasant words**
Beautiful	Accident
Good	Cancer
Happy	Disaster
Health	Pollution
Honest	Poverty
Joke	Sickness
Laugh	Ugly
Lucky	Vomit
Peace words	**Violence words**
Calm	Attack
Dove	Hit
Peace	Hurt
Quiet	Kill
Rest	Murder
Sleep	Stab
Tranquil	Strangle
Whisper	Threaten