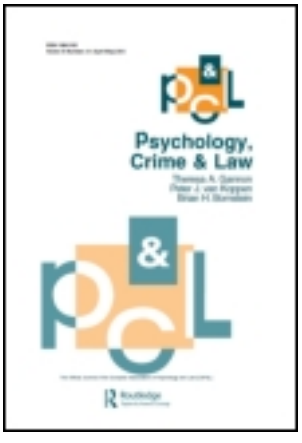

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Alexithymia in Dutch violent forensic psychiatric outpatients

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Until now alexithymia has not been investigated in Dutch low-educated offenders who are known for their violent behaviour. We therefore investigated a sample of aggressive forensic psychiatric outpatients, who are characterized by emotional dysregulation in conflict situations. For that purpose we used a Dutch questionnaire, the Bermond-Vorst Alexithymia Questionnaire (BVAQ; Vorst & Bermond, 2001), which we also administered in a sample of secondary vocational students for a comparison. Unfortunately, the five-factor structure of the BVAQ could not be confirmed in both samples, but in the patient sample the test-retest reliability of the total score turned out to be moderate, and meaningful correlations were found with measures of relevant personality domains and problem behaviours. When both samples were compared, patients were found to display significantly higher total scores on the BVAQ than the secondary vocational students, when controlled for age. Therefore, we concluded that alexithymia may contribute to the aggressive behaviour of violent forensic psychiatric outpatients. However, patients as well as students had much higher total scores on the BVAQ than found by Vorst and Bermond (2001) in a sample of Dutch psychology students. This indicates that alexithymia as measured by the BVAQ is also inversely related to educational level and perhaps to intelligence.

Keywords: violence; alexithymia; forensic psychiatric outpatients; Bermond-Vorst Alexithymia Questionnaire

Introduction

According to Taylor (2000), alexithymia is a multifaceted personality construct that has been associated with various medical and psychiatric disorders, and which is probably normally distributed in the general population (Mikolajczak & Luminet, 2006). Features of alexithymia are: (1) difficulty in identifying and describing subjective feelings, (2) difficulty in distinguishing between feelings and the bodily sensations of emotional arousal, (3) constricted imaginal capacities, and (4) an externally oriented cognitive style (Nemiah, Freyberger, & Sifneos, 1976). Evidence for the construct validity of alexithymia was supported by Luminet, Bagby, Wagner, Taylor, and Parker (1999). When using the Toronto Alexithymia Scale (TAS-20; Bagby, Parker, & Taylor, 1994a; Bagby, Taylor, & Parker, 1994b), they found that alexithymia correlated positively with the Big Five domain neuroticism and negative with the domains extraversion and openness in a sample of 101 university students. These findings were in agreement with the results of a study by Picardi, Toni, and Caroppo (2005) in a group of

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215 Italian university students, but Zimmerman, Rossier, De Stakehofen, and Gaillard (2005) could only demonstrate a significant correlation between the TAS-20 and the personality domain neuroticism in a group of 136 Swiss undergraduate students.

The association between alexithymia and various aspects of emotional processing has been studied in a number of experimental studies in non-offender populations (Taylor & Bagby, 2004). For instance, Suslow and Junghanns (2002) found that high alexithymics manifested a delay in taking lexical decisions to emotion words after presentation of a related emotion situation as compared to an unrelated situation. These authors regarded their results as support for the theoretical view that affective-cognitive schemata are not well integrated in alexithymic individuals. An example of a neurobiological approach is the fMRI study of Berthoz, Artiges, Van de Moortele, Poline, Rouquette, Consoli, and Martinot (2002), who concluded that men with alexithymia have less cerebral activation in the mediofrontal-paracingulate cortex in response to highly negative stimuli and more activation in the anterior cingulate, mediofrontal cortex in response to highly positive stimuli than men without alexithymia. Another neurobiological approach is the use of EEG recordings during the presentation of emotional stimuli, for instance by Aftanas, Varlamov, Reva, and Pavlov (2003). These researchers recorded EEG while a group of 21 non-alexithymics and a group of 20 alexithymics viewed sequentially presented neutral, pleasant, and unpleasant pictures, which they had to rate after presentation. Alexithymia appeared to be indexed by early frontal synchronization in the upper theta band influences. According to Aftanas et al. (2003), these results can best be interpreted as a reflection of dysregulation during appraisal of emotional stimuli.

Although most of the research about alexithymia concerned persons suffering from medical and psychiatric disorders, there is some evidence that such a characterization is also applicable to offenders. In a sample of 40 adolescent offenders and 20 controls (all males) Langevin and Hare (2001) found that alexithymia correlated positively with psychopathy and that the offenders had higher scores on the TAS-20 than the control group. These results were supported in a study by Zimmerman (2006), which showed that 36 adolescent offenders scored significantly higher on alexithymia as measured by the TAS-20 than 46 controls. The 82 adolescents ranged in age from 14 to 18 years and the 36 offenders had committed crimes such as theft, burglary, assault, robbery, and rape. However, a study by Moriarty, Stough, Tidmarsh, Eger, and Dennison (2001) yielded no significant differences in scores on the TAS-20 between a group of 15 adolescent sex offenders and a group of 49 non-offenders (all males), but in our opinion this study had less power to draw conclusions. A recent study of Christopher and McMurran (2009) in a group of 79 offenders with different index offenses, showed that alexithymia as measured by the TAS-20 was related to less social problem solving and less empathic concern.

There is also growing evidence that there is a neurobiological basis for the link between dysfunctional emotion regulation on the one hand and aggressive and violent behaviour on the other (Davidson, Jackson, & Kalin, 2000). Herpertz, Werth, Lukas, Qunabi, Schuerkens, Kunert, Freese, Flesch, Mueller-Isberner, Osterheider, and Sass (2001) used electrodermal response and modulation of the startle reflex as an indicator of emotional arousal in a group of 18 offenders with a borderline personality disorder who were 'convicted for capital crimes', and found that these offenders are characterized by a pronounced lack of fear toward aversive or frightening events, possibly because of a general deficit in processing affective

information. After analysis of 17 neuroimaging studies on samples of offenders, Bufkin and Luttrell (2005) concluded that aggressive and violent behaviour was associated with a dysfunction of the prefrontal cortex and of the medial-temporal lobe, two structures which in their opinion are involved in emotion regulation.

Several studies have demonstrated that different forms of emotional dysregulation seem to operate in reactive and proactive aggression. Reactive aggression can be defined as emotional, defensive, and hot-tempered behaviour, and proactive aggression as calculating, offensive, and cold-blooded behaviour (Dodge, Lochman, Harnish, Bates, & Petit, 1997). These definitions suggest that reactively aggressive behaviour may be related to weak and proactively aggressive behaviour to strong emotional control. Differences between offenders who mainly exhibit reactive aggression and those who show more proactive aggression mainly seem to be caused by the interpersonal and affective aspects of psychopathy (Dempster, Lyon, Sullivan, & Hart, 1996; Patrick & Zempolich, 1998; Woodworth & Porter, 2002). Violent offenders with relatively high scores on psychopathy usually exhibit more proactive aggression than offenders with relatively low scores on psychopathy, who mostly display reactive aggression (Blair, 2003; Cornell, Warren, Hawk, Stafford, Oram, & Pine, 1996; Hart & Dempster, 1997; Hornsveld, Hollin, Nijman, & Kraaimaat, 2007; Vitacco, Neumann, & Caldwell, 2006; Woodworth & Porter, 2002). According to Blair (2001), these different forms of aggression can be regarded as different disorders. Reactive aggression may be related to impairments in executive emotional systems due to orbitofrontal cortex lesions, while amygdale dysfunction seems to play an essential role in proactive aggression, as for instance exhibited by psychopaths.

In summary, there are numerous indications that emotional dysregulation is a feature of aggressive behaviour, and therefore the concept of alexithymia might be applicable to violent offenders. Although the Toronto Alexithymia Scale-20 is the most widely used instrument to measure alexithymia, several authors demonstrated that the Bermond-Vorst Alexithymia Questionnaire (BVAQ; Vorst & Bermond, 2001) probably has better psychometric properties. For instance, Zech, Luminet, Rimé, and Wagner (1999) analyzed the factor structure of both the TAS-20 and the BVAQ in British and French-speaking Belgian university students and found that a short version of the BVAQ, the BVAQ-20B, yielded the best fit in both samples. A study of Berthoz, Ouhayou, Perez-Diaz, Consoli, and Jouvent (2000) indeed showed that the three-factor structure of the TAS-20 and the five-factor structure of the BVAQ could be confirmed in a group of French university students, but they still recommended the use of the BVAQ. In their opinion, the TAS-20 fails to measure alexithymia as it was originally conceptualized, because the assessment of fantasies has been eliminated. The factor structure of the TAS-20 was also studied by Kooiman, Spinhoven, and Trijsburg (2002) in a group of Dutch university students and a group of psychiatric outpatients. Their results indicated that the questionnaire discriminated between patients and non-patients, but that a two-factor instead of a three-factor solution is more relevant to the TAS-20, and that the test-retest reliability of two subscales was insufficient. They therefore concluded that the TAS-20 has a number of major shortcomings with respect to reliability and validity. In addition, Leising, Grande, and Faber (2009) questioned the validity of the TAS-20. In a sample of psychiatric inpatients and healthy controls they found that the TAS-20 total score was strongly correlated with the total scores of two psychopathology questionnaires and concluded that the TAS-20 total score primarily assesses general distress.

For our study of alexithymia in violent forensic psychiatric outpatients we used the Dutch Bermond-Vorst Alexithymia Questionnaire (BVAQ; Vorst & Bermond, 2001), which we also administered in sample of secondary vocational students for a comparison. In order to investigate whether the BVAQ is a reliable and valid instrument for the measurement of alexithymia in these low-educated populations, we first analyzed its psychometric properties in both samples. As support for a role of alexithymia in aggressive behaviour of forensic psychiatric outpatients, we expected a positive relation of alexithymia with psychopathy, neuroticism, anger, hostility, and aggression, and a negative relation with extraversion, openness, agreeableness, and social anxiety in the patients' sample. Further support for this relationship can be demonstrated when patients score higher than students on the BVAQ.

Method

Participants

The study was conducted in a clinical sample of 139 male outpatients (53.96% adolescents and 46.04% adults), who were obligatory treated at a forensic psychiatric outpatient clinic, as part of their sentence for violent offenses. Their average age was 23.73 years ($SD = 9.42$; range = 16–56 years) and 49.61% of them belonged to an ethnic minority. The outpatients had a conduct disorder as primary classification on axis I or, if they were 18 years or older, a main classification of antisocial personality disorder on axis II (DSM-IV: American Psychiatric Association, 1994). A second classification on axis II, was for eight of the 64 adult patients a borderline, for four a narcissistic, for one a histrionic, for one a dependent, and for one an obsessive-compulsive personality disorder.

DSM-IV classifications were assessed in an intake team, based on an intake report and on an earlier psychiatric and psychological evaluation, which had resulted in a decision of the judge to impose the treatment. However, no standardized interviews were used during the intake as well as during the evaluation made for the court. Patients did not use medication during the intake, because they considered themselves not as psychiatrically ill and saw their conviction as a juridical aberration. When the intaker noticed a possible indication for pharmacological treatment, they always refused referral to a psychiatrist.

The non-clinical sample comprised 160 male students, who followed secondary vocational education. In the Netherlands secondary vocational education follows after elementary school and concerns a professional training at the lowest level for trades such as carpenter, housepainter, or electrician. The mean age of these participants was 17.35 years ($SD = 1.08$; range = 16–21 years) and 50.92% was of original Dutch descent, whereas the others were of non-Dutch descent. Patients and students of non-Dutch descent generally had at least one parent from Surinam, the Netherlands Antilles, Turkey, Morocco, or Cape Verde.

Measures

The *Bermond-Vorst Alexithymia Questionnaire* (BVAQ; Vorst-Bermond, 2001) contains 40 items which are spread over five subscales: (1) difficulties in verbalizing emotions (e.g., 'I like to tell others about my emotions'), (2) difficulties in fantasizing

(e.g., 'I use my fantasy often'), (3) difficulties in differentiating between emotions (e.g., 'When I am stressed, it remains unclear to me which emotional feeling causes this'), (4) difficulties in experiencing emotions (e.g., 'When something unexpected happens, I remain quiet and unmoved'), and (5) difficulties in analyzing emotions (e.g., 'In my opinion you must have kept in contact with your feelings'). The questionnaire has two subquestionnaires with 20 items (form A and form B). There have been publications about form B under the name of Amsterdam Alexithymia Questionnaire (Bermond, Vorst, Vingerhoets, & Gerritsen, 1999; Sauvage & Loas, 2006). One half of the items of each subscale are formulated positively (e.g., 'I like to tell others about my emotions'), the other half negatively (e.g., 'I find it difficult to put my emotions into words'). The items of each subscale have to be rated on a five-point Likert-scale from 'entirely agree' to 'entirely disagree'. High scores are indicative of high proneness to alexithymia. The validity of the BVAQ was demonstrated by Zech, Luminet, Rimé, and Wagner (1999) in a group of 290 British university students (males and females). These authors found a significant positive correlation between the total score of the TAS-20 and the B form of the BVAQ, suggesting that the two instruments assess the same construct well. A similar result was obtained by Vorst and Bermond (2001) in a group of 430 Dutch university students (males and females). Form A, form B, and form AB of the BVAQ all three correlated positively with the total score on a Dutch version of the TAS-20.

The *Psychopathy Checklist-Revised* (PCL-R; Hare, 1991) was employed for measuring 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, Verheul, De Ruiter, and Hildebrand (2002) found support for the reliability and validity of the Dutch version of the PCL-R. In the present study we use the four-factor structure as it has been proposed by Hare (2003), which implies the following dimensions: Interpersonal, Affective, Lifestyle, and Antisocial.

The *NEO Five Factor Inventory* (NEO-FFI; Costa & McCrae, 1992; Dutch version: Hoekstra, Ormel, & De Fruyt, 1996) has 60 items and measures the Big Five personality domains of Neuroticism, Extraversion, Openness, Agreeableness, and Conscientiousness. Subjects score items of the NEO-FFI on a five-point Likert scale from 'entirely disagree' to 'entirely agree'. In a Dutch sample of 135 non-clinical adults, evidence has been obtained to support the reliability and validity of the NEO-FFI (Hoekstra et al., 1996).

The *State-Trait Anger Scale* (STAS; Spielberger, 1980; Dutch version: Van der Ploeg, Defares, & Spielberger, 1982). Ten trait items were used to measure the general disposition to anger. Participants were asked to indicate for each item how they generally felt by using a four-point Likert scale: 1 = 'almost never', 2 = 'sometimes', 3 = 'often', and 4 = 'almost always'. Internal consistency, test-retest reliability, and validity of the Dutch version of the trait anger scale have proven to be satisfactory (Van der Ploeg et al., 1982).

An *Adapted Version* of Rosenzweig's (1978) *Picture-Frustration Study* (PFS-AV; Hornsveld, Nijman, Hollin, & Kraaimaat, 2007) was employed for measuring hostility. The test asks participants to write down their reactions to 12 cartoon-like pictures. Subjects are instructed to examine situations as shown in the pictures and write the first appropriate reply that enters their mind in the blank text box. Answers are scored by an independent rater on a seven-point Likert scale, ranging from 1 = 'not at all hostile' to 7 = 'extremely hostile'. In a sample of Dutch violent

forensic psychiatric patients, the internal consistency, test-retest reliability, and interrater reliability of the PFS-AV appeared to be moderate to good. Furthermore, evidence was found for the validity of the test as scores correlated in a meaningful way with indexes of agreeableness and aggressive behaviour (Hornsveld et al., 2007).

The *Aggression Questionnaire* (AQ; Buss & Perry, 1992; Dutch version: Meesters, Muris, Bosma, Schouten, & Beuving, 1996) comprises 29 items that can be allocated to four subscales, i.e. 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 score the items using a five-point scale ranging from 1 = "entirely disagree" to 5 = "entirely agree". In a combined sample of Dutch violent forensic psychiatric patients (138 inpatients and 206 outpatients; all males), internal consistency and test–retest reliability of the AQ appeared to be good and the validity of the questionnaire could be demonstrated by meaningful correlations with alternative measures of aggression and personality (Hornsveld, Muris, Kraaimaat, & Meesters, 2009). In the present study we only used the scores of the total AQ and of the Anger subscale.

The *Novaco Anger Scale – Provocation Inventory* (NAS-PI; Novaco, 1994) is constructed in two parts. The NAS part of the NAS-PI contains 48 items that focus on how an individual experiences anger, and which have to be rated on a three-point scale (1 = 'never true', 2 = 'sometimes true', 3 = 'always true'). The PI part consists of 25 items that refer to anger-eliciting situations, and which have to be rated on a four-point scale (1 = 'not at all angry', 2 = 'a little angry', 3 = 'fairly angry', 4 = 'very angry'). The items of the NAS are spread over three interrelated domains, i.e., Cognive, Arousal, and Behaviour. Participants only had to complete the NAS. In the present study only the scores of the total NAS were used.

The *Inventory of Interpersonal Situations* (IIS; Van Dam-Baggen & Kraaimaat, 1999) assesses how much anxiety people experience during social interactions (social anxiety) and how often they are able to actually perform the appropriate behaviour in such situations (social skills). In the present study, two subscales of this inventory, namely Giving Criticism and Giving Compliments were used, as the results of a previous study indicated that only these subscales differentiated between violent and non-violent participants (Hornsveld, 2005). The internal consistency and the test-retest reliability of the IIS can be qualified as good. Furthermore, significant correlations have been found between IIS and measures of anxiety, which support the validity of the scale (Van Dam-Baggen & Kraaimaat, 1999).

Procedure

A standard set of questionnaires was submitted individually to the patients prior to a cognitive-behavioural group therapy (Hornsveld et al., 2008). In this study the scores on these questionnaires were used to determine the concurrent and discriminant validity of the BVAQ.

One of the indication criteria for participation in the group therapy was a sufficient command of the Dutch language in writing and speaking. Questionnaires were completed under supervision of an experienced research assistant. When all items of the questionnaires were completed, patients received a fee of €5 in return for their participation. A subsample of 45 outpatients filled out the BVAQ during the

intake interview some four weeks before the start of the therapy, so that it became possible to examine the test-retest of the BVAQ in a forensic outpatient sample.

PCL-R scores were assessed by experienced and certified psychologists. Scores were based on the structured intake interview and information from an extensive psychiatric and psychological evaluation on the basis of which the judge had decided on obligatory treatment.

The secondary vocational students completed the set of questionnaires in their classrooms at school. Most students did not need more than one hour to do this. Completion was supervised by the first author and a research assistant. After a check on missing scores, students received a fee of €10 in return for their participation.

Results

Scales and subscales of the BVAQ

In order to investigate whether the BVAQ is a reliable and valid instrument in both low-educated samples, a confirmative factor analysis (AMOS 16.0) was carried out of the original five-factor structure of the BVAQ. We used the criteria of Schermelleh-Engel, Moosbrugger, and Müller (2003) for the Goodness of Fit indexes. In the outpatient sample, the five-factor structure of the original scale with 40 items (form AB) yielded an unacceptable fit for the data: $Chi^2/df = 2.07$, GFI = .62, CFI = .51, and RMSEA = .09. Although the five-factor structure of form B provided a better fit than form AB in this sample, the Goodness of Fit indexes for this short version of the BVAQ were still unacceptable: $Chi^2/df = 2.84$, GFI = .79, CFI = .74, and RMSEA = .09. In the sample of students similar results were found. The Goodness of Fit indexes indicated that the five-factor model for the BVAQ with 40 items (form AB) did not produce an acceptable fit for the data: $Chi^2/df = 2.14$, GFI = .63, CFI = .40, and RMSEA = .09. The five-factor structure of the last 20 items (form B) of the BVAQ also provided an unacceptable fit in this sample: $Chi^2/df = 2.46$, GFI = .79, CFI = .52, and RMSEA = 1.00.

After this, we calculated internal consistency coefficients, mean inter-item correlations, mean item-scale correlations, and test-retest reliability for the BVAQ (form AB and form B), and each of the subscales in the two studied samples. Internal consistency coefficients for the total score of the BVAQ (form AB) were .78 in the outpatient and .76 in the student group. Mean inter-item correlations were respectively .09 and .07, and item-scale correlations .26 and .24. Cronbach's α's for the subscales varied from .51 to .77, mean inter-item correlations from .11 to .30, and mean item-scale correlations from .24 to .47. The test-retest correlations (four weeks interval) were significant for the BVAQ total and subscale scores. Results for form B were poorer than those for form AB of the BVAQ (Table 1).

Association of alexithymia with related constructs in patients and students

Because of the unconfirmed five-factor structure in both forms of the BVAQ, and the rather low internal consistencies and low test-retest reliabilities of several form B subscales, only the total score of form AB was used in our further investigation. Correlations were calculated between total scores on form AB of the BVAQ and personality characteristics in both samples (Table 2). In the sample of outpatients,

Table 1. Internal consistency coefficients (Cronbach's alpha's), mean inter-item correlations, and mean item-scale correlations of the BVAQ (form AB and form B) in outpatients ($N = 139$) and students ($N = 160$), and test-retest reliability for outpatients ($N = 45$).

		Internal consistency		Mean inter-item correlations		Mean item-scale correlations		Test-retest reliability
		Outpats.	Students	Outpats.	Students	Outpats.	Students	Outpats.
BVAQ form AB	Total	.78	.76	.09	.07	.26	.24	.70*
	Verbalizing	.77	.61	.30	.17	.47	.32	.63*
	Fantasizing	.71	.63	.24	.18	.41	.32	.56*
	Identifying	.70	.57	.23	.14	.40	.28	.39*
	Emotionalizing	.51	.52	.11	.12	.24	.24	.47*
	Analyzing	.69	.61	.22	.16	.38	.31	.67*
BVAQ form B	Total	.65	.64	.09	.08	.24	.23	.69*
	Verbalizing	.57	.42	.25	.16	.36	.24	.46*
	Fantasizing	.61	.49	.28	.20	.39	.29	.61*
	Identifying	.61	.39	.28	.14	.39	.21	.18
	Emotionalizing	.32	.31	.10	.10	.17	.16	.61*
	Analyzing	.58	.63	.26	.30	.36	.42	.63*

Note: BVAQ = Bermond-Vorst Alexithymia Questionnaire. *$p < .01$.

total scores on form AB correlated positively with the antisocial facet of the PCL-R, trait anger (STAS), hostility (PFS-AV), state anger (NAS), and aggression (AQ). Negative correlations, explaining only 4 to 8% of the variance, were found between form AB and openness, agreeableness, and social skills in situations referring to giving a compliment. In the student sample the BVAQ total score correlated only positively with extraversion (NEO-FFI) and negatively with openness (NEO-FFI), explaining 3 to 14% of the variance respectively.

Comparison of alexithymia and related constructs across the two groups

The mean total scores of the outpatients were compared with those of the secondary vocational students. We corrected for age by entering this variable as a covariate in the analyses of variance, as the students were significantly younger than the patients. Results showed that the outpatients as a group displayed significantly higher total scores than the group students on form AB of the BVAQ [$F(2,296) = 5.03$; $p < .01$; one-tailed]. In addition, no differences were found between total BVAQ-scores of the ethnic and those of the non-ethnic patients [$F(2,136) = .22$, $p = .80$], and between the total BVAQ-scores of the ethnic and non-ethnic students [$F(2,157) = 2.86$, $p = .06$].

With respect to alexithymia related variables, outpatients were found to have significantly higher scores on neuroticism (NEO-FFI), trait anger (STAS), hostility

Table 2. Correlations between BVAQ total score (form AB) and scores on other measures for outpatients ($N = 139$) and students ($N = 160$).

		BVAQ form AB	
Measures	Content of scale	Outpatients	Students
PCL-R	Psychopathy	.07	—
	Interpersonal	−.10	—
	Affective	−.05	—
	Lifestyle	.14	—
	Antisocial	.20*	—
NEO-FFI	Neuroticism	−.02	−.01
	Extraversion	−.15	.18*
	Openness	−.23**	−.37**
	Agreeableness	−.28**	−.13
	Conscientiousness	−.01	−.13
STAS	Trait anger	.20*	.02
PFS-AV	Hostility	.21*	.09
AQ	Aggression	.23**	.08
	Anger	.19*	.06
NAS	Anger	.19*	.11
IIS Anxiety	Criticism	−.04	.08
	Compliment	−.06	.05
IIS Skills	Criticism	−.15	.08
	Compliment	−.25**	−.13

Notes: BVAQ = Bermond-Vorst Alexithymia Questionnaire; PCL-R = Psychopathy Checklist-Revised; NEO-FFI = Five Factor Inventory; STAS = State-Trait Anger Scale; PFS-AV = Adapted version of the Picture-Frustration Study; AQ = Aggression Questionnaire; NAS = Novaco Anger Scale; IIS = Inventory of Interpersonal Situations. *$p < .05$; **$p < .01$.

(PFS-AV), aggression (AQ Total), and state anger (AQ Anger subscale, NAS Anger). In addition, they scored significantly lower than the secondary vocational students on extraversion and on social anxiety in situations where criticism or compliments can be given (Table 3).

Discussion

We investigated alexithymia in a group of forensic psychiatric outpatients to explore whether emotional dysregulation contributes to their aggressive and violent behaviour in conflict situations. For a comparison we used a group of secondary vocational students, because in the Netherlands alexithymia has only been studied in university students until now. For the measurement of alexithymia we used a Dutch questionnaire, the Bermond-Vorst Alexithymia Questionnaire (BVAQ; Vorst & Bermond, 2001), which we first studied according to its psychometric properties. Unfortunately, the five-factor structure of two forms of the BVAQ (form AB and form B) could not be confirmed in both samples, but other psychometric properties of form AB, i.e. the total score of the BVAQ, were found to be satisfactory for further investigation of alexithymia. In outpatients moderate and meaningful associations

Table 3. Comparison of scores on various measures between outpatients ($N = 139$) and students ($N = 160$), while controlling for age.

		Outpatients	Students	
Measures	Factor or (sub)scale	*M (SD)*	*M (SD)*	Statistics
Age		23.73 (9.42)	17.35 (1.08)	$t(297) = 8.48$**
BVAQ	Alexithymia	120.08 (17.73)	113.89 (16.16)	$F(2,296) = 5.03$**
PCL-R	Psychopathy	18.87 (5.57)	—	
	Interpersonal	3.62 (1.87)	—	
	Affective	6.38 (1.74)	—	
	Lifestyle	4.97 (2.25)	—	
	Antisocial	3.61 (1.81)	—	
NEO-FFI	Neuroticism	32.62 (8.52)	30.69 (7.08)	$F(2,296) = 8.09$**
	Extraversion	40.63 (5.54)	42.35 (5.54)	$F(2,296) = 3.73$*
	Openness	34.36 (5.44)	33.89 (4.73)	$F(2,296) = 3.60$*
	Agreeableness	39.10 (5.53)	39.56 (4.79)	$F(2,296) = .30$
	Conscientiousness	43.42 (6.73)	42.69 (5.02)	$F(2,296) = .62$
STAS	Trait anger	21.47 (7.74)	18.11 (5.47)	$F(2,296) = 14.34$**
PFS-AV	Hostility	35.04 (11.14)	28.93 (5.87)	$F(2,296) = 19.06$**
AQ	Aggression	91.35 (20.28)	82.56 (16.31)	$F(2,296) = 11.74$**
	Anger	20.91 (5.61)	17.93 (4.74)	$F(2,296) = 18.91$**
NAS	Anger	93.23 (18.46)	89.38 (14.18)	$F(2,296) = 3.10$*
IIS Social anxiety	Criticism	13.81 (5.06)	17.20 (4.50)	$F(2,296) = 19.84$**
	Compliment	6.65 (3.06)	9.36 (4.10)	$F(2,296) = 20.17$**
IIS Social skills	Criticism	21.60 (5.26)	19.99 (4.11)	$F(2,296) = 5.65$**
	Compliment	14.56 (3.44	13.85 (3.44)	$F(2,296) = 1.92$

Notes: PCL-R = Psychopathy Checklist-Revised; NEO-FFI = Five Factor Inventory; STAS = State-Trait Anger Scale; PFS-AV = Adapted version of the Picture-Frustration Study; AQ = Aggression Questionnaire; NAS = Novaco Anger Scale; IIS = Inventory of Interpersonal Situations. *$p < .05$; **$p < .01$ (one-tailed).

with alexithymia were found with the psychopathy dimension of antisocial behaviour, the personality traits of openness and agreeableness, and measures of anger, hostility and aggression. However, it has to be noted these associations were relatively low. In addition, with the exception of openness no significant associations between alexithymia and personality traits were found in the sample of secondary vocational students. When both samples were compared, patients were found to display significantly higher total scores on form AB of the BVAQ than the secondary vocational students, when controlled for age. Therefore, we concluded that alexithymia may contribute to the aggressive behaviour of violent forensic psychiatric outpatients.

The results of our study must be interpreted with caution. Scores on self-report can be influenced by the tendency of respondents to give socially desirable answers and by the limited understanding of their own social functioning. A second limitation is that we used a group of secondary vocational students for the comparison with the outpatients, although we statistically controlled for age. Therefore, we recommend a replication of this study with an age-matched group of low-educated adults as controls.

Two remarkable findings require further exploration in our opinion. The first finding concerns the relatively higher alexithymia scores in our sample of male outpatients (form AB: mean 120.08, $SD = 17.73$) and our sample of male students (form AB: mean = 113.89, $SD = 16.16$) compared with the scores which Vorst and Bermond (2001) found in their sample of female and male psychology students (mean = 86.36, $SD = 17.66$). These differences in scores seem to indicate that alexithymia as measured by the BVAQ is inversely related to educational level, and perhaps to level of verbal intelligence.

Secondly, no significant associations were found between alexithymia and both the PCL-R total score and the factors of the PCL-R, with the exception of the antisocial factor. This might be due to the rather general conceptualization of alexithymia by means of the total score of the BVAQ as well as insufficient discriminative power of the PCL-R factors. More specifically, research is warranted with respect to the different forms of emotional dysregulation as can be noticed in persons who mainly exhibit reactively aggressive and those who mostly display proactively aggressive behaviour.

Summing up, we conclude that alexithymia may be a relevant concept for the explanation of anger and aggression in violent forensic psychiatric outpatients, but much less so for secondary vocational students. The question whether the construct of alexithymia can be related to reactive and/or proactive aggression is of special importance in this regard. Besides, a further exploration of the Bermond-Vorst Alexithymia Questionnaire in its current form is needed to find out if it is a useful instrument for the measurement of alexithymia in low-educated populations.

References

Aftanas, L.I., Varlamov, A.A., Reva, N.V., & Pavlov, S.V. (2003). Disruption of early-related theta synchronization of human EEG in alexithymics viewing affective pictures. *Neuroscience Letters*, *340*, 57–60.

American Psychiatric Association. (1994). *Diagnostic and statistical manual of mental disorders* (4th ed.). Washington, DC: American Psychiatric Association.

Bagby, R.M., Parker, J.D.A., & Taylor, G.J. (1994a). The Twenty-Item Toronto Alexithymia Scale-I: Item selection and cross-validation of the factor structure. *Journal of Psychosomatic Research*, *38*, 23–32.

Bagby, R.M., Taylor, G.J., & Parker, J.D.A. (1994b). The Twenty-Item Toronto Alexithymia Scale-II: Convergent, discriminant, and concurrent validity. *Journal of Psychosomatic Research*, *38*, 33–40.

Bermond, B., Vorst, H.C., Vingerhoets, A.J., & Gerritsen, W. (1999). The Amsterdam Alexithymia Scale: Its psychometric values and correlations with other personality traits. *Psychotherapy & Psychosomatics*, *68*, 241–251.

Berthoz, S., Artiges, E., Van de Moortele, P.F., Poline, J.B., Rouquette, S., Consoli, S.M., & Martinot, J.L. (2002). Effect of impaired recognition and expression of emotions on frontocingulate cortices: An fMRI study on men with alexithymia. *American Journal of Psychiatry*, *159*, 961–967.

Berthoz, S., Ouhayoun, B., Perez-Diaz, Consoli, S.M., Jouvent, R. (2000). Comparison of the psychometric properties of two self-report questionnaires measuring alexithymia: Confirmatory analysis of the 20-item Toronto Alexithymia Scale and the Bermond-Vorst Alexithymia Questionnaire (BVAQ). *European Review of Applied Psychology, 50,* 359–368.

Blair, R.J.R. (2001). Neurocognitive models of aggression, the antisocial personality disorders, and psychopathy. *Journal of Neurology, Neurosurgery, and Psychiatry*, *71*, 727–731.

Blair, R.J.R. (2003). Neurological basis of psychopathy. *The British Journal of Psychiatry*, *182*, 5–7.

Bufkin, J.L., & Luttrell, V.R. (2005). Neuroimaging studies of aggressive and violent behavior: Current findings and implications for criminology and criminal justice. *Trauma, Violence Abuse*, *6*, 176–191.

Buss, A.H., & Perry, M. (1992). The aggression questionnaire. *Journal of Personality and Social Psychology*, *63*, 452–459.

Christopher, G., & McMurran, M. (2009). Alexithymia, empathic concern, goal management, and social problem solving in adult male prisoners. *Psychology, Crime & Law*, *15*, 697–709.

Cornell, D.G., Warrem, J., Hawk, G., Stafford, E., Oram, G., & Pine, D. (1996). Psychopathy in instrumental and reactive offenders. *Journal of Consulting and Clinical Psychology*, *64*, 783–790.

Costa, P.T., Jr., & McCrae, R.R. (1992). Revised NEO Personality Inventory (NEO-PI-R) and the Five Factor Inventory (NEO-FFI): Professional manual. Odessa, FL: Psychological Assessment Resources Inc.

Davidson, R.J., Jackson, D.C., & Kalin, N.H. (2000). Emotion, plasticity, context, and regulation: Perspectives from affective neuroscience. *Psychological Bulletin*, *126*, 890–809.

Dempster, R.J., Lyon, D.R., Sullivan, L.E., & Hart, S.D. (1996, August). Psychopathy and instrumental aggression in violent offenders. Paper presented at the Annual Meeting of the American Psychological Association, Toronto, Ontario.

Dodge, K.A., Lochman, J.E., Harnish, J.D., Bates, J.E., & Petit, G.S. (1997). Reactive and proactive aggression in school children and psychiatrically impaired chronically assaultive youth. *Journal of Abnormal Psychology*, *106*, 37–51.

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

Hare, R.D. (2003). *The Hare Psychopathy Checklist – Revised 2nd edition*. Toronto: Multi-Health Systems.

Hart, S.D., & Dempster, R.J. (1997). Impulsivity and psychopathy. In C.D. Webster & M.A. Jackson (Eds.), *Impulsivity: Theory, assessment, and treatment* (pp. 212–232). New York: Guilford.

Herpertz, S.C., Werth, U., Lukas, G., Qunabi, M., Schuerkens, A., Kunert, H-J., Freese, R., Flesch, M., Mueller-Isberner, R., Osterheider, M., & Sass, H. (2001). Emotion in criminal offenders with psychopathy and borderline personality disorder. *Archives of General Psychiatry*, *58*, 737–745.

Hoekstra, H.A., Ormel, J., & Fruyt, F. de (1996). *Handleiding NEO Persoonlijkheidsvragenlijsten [Manual NEO Personality Questionnaires]*. Lisse, NL: Swets Test Services.

Hornsveld, R.H.J. (2005). Evaluation of Aggression Control Therapy for violent forensic psychiatric patients. *Psychology, Crime and Law*, *11*, 403–410.

Hornsveld, R.H.J., Hollin, C.R., Nijman, H.L.I., & Kraaimaat, F.W. (2007). Violent forensic psychiatric patients: Individual differences and consequences for treatment. *International Journal of Forensic Mental Health*, *6*, 15–27.
Hornsveld, R.H.J., Muris, P., Kraaimaat, F.W., & Meesters, C. (2009). The Aggression Questionnaire in Dutch violent forensic psychiatric patients and secondary vocational students. *Assessment*, *16*, 181–192.
Hornsveld, R.H.J., Nijman, H.L.I., Hollin, C.R., & Kraaimaat, F.W. (2007). An adapted version of the Rosenzweig Picture-Frustration Study for the measurement of hostility in violent forensic psychiatric patients. *Criminal Behaviour and Mental Health*, *17*, 45–56.
Hornsveld, R.H.J., Nijman, H.L.I., & Kraaimaat, F.W. (2008). Aggression Control Therapy for violent forensic psychiatric patients: First results. *Psychology, Crime & Law*, *14*, 1–18.
Kooiman, C.G., Spinhoven, P., & Trijsburg, R.W. (2002). The assessment of alexithymia: A critical review of the literature and a psychometric study of the Toronto Alexithymia Scale-20. *Journal of Psychosomatic Research*, *53*, 1083–1090.
Langevin, R., & Hare, R.D. (2001). Psychopathie et alexithymie chez un groupe de jeunes contrevenants. *Revue Canadienne de Psycho-éducation*, *30*, 227–236.
Leising, D., Grande, T., & Faber, R. (2009). The Toronto Alexithymia Scale (TAS-20): A measure of general psycholgical distress. *Journal of Research in Personality*, *43*, 707–710.
Luminet, O., Bagby, R.M., Wagner, H., Taylor, G.J., & Parker, J.D.A. (1999). Relation between alexithymia and the Five-Factor model of personality: A facet-level analysis. *Journal of Personality Assessment*, *73*, 344–358.
Meesters, C., Muris, P., Bosma, H., Schouten, E., & Beuving, S. (1996). Psychometric evaluation of the Dutch version of the Aggression Questionnaire. *Behaviour Research and Therapy*, *34*, 839–843.
Mikolajczak, M., & Luminet, O. (2006). Is alexithymia affected by situational stress or is it a stable trait related to emotion regulation? *Personality and Individual Differences*, *40*, 1399–1408.
Moriarty, N., Stough, C., Tidmarsh, P., Eger, D., & Dennison, S. (2001). Deficits in emotional intelligence underlying adolescent sex offending. *Journal of Adolescence*, *24*, 743–751.
Nemiah, J.C., Freyberger, H., & Sifneos, P.E. (1976). Alexithymia: A view of the psychosomatic process. In O.W. Hill (Ed.), *Modern trends in psychosomatic medicine* Vol. 2, (pp. 430–439). London: Butterworths.
Novaco, R.W. (1994). Anger as a risk factor for violence among the mentally disordered. In J. Monahan & H.J. Steadman (Eds.), *Violence and mental disorder* (pp. 21–59). Chicago: The University of Chicago Press.
Patrick, C.J., & Zempolich, K.A. (1998). Emotion and aggression in the psychopathic personality. *Aggression and Violent Behavior*, *3*, 303–338.
Picardi, A., Toni, A., & Caroppo, E. (2005). Stability of alexithymia and its relationships with the 'Big Five' factors, temperament, character, and attachment style. *Psychotherapy & Psychosomatics*, *74*, 371–378.
Rosenzweig, S. (1978). *Aggressive behavior and the Rosenzweig Picture-Frustration Study*. New York: Praeger.
Sauvage, L., & Loas, G. (2006). Criterion validity of Bermond-Vorst Alexithymia Questionnaire-20 Form B: A study of 63 alcoholic subjects. *Psychological Reports*, *98*, 243–236.
Schermelleh-Engel, K., Moosbrugger, H., & Müller, H. (2003). Evaluating the fit of structural equation models: Test of significance and descriptive Goodness-of-Fit measures. *Methods of Psychological Research Online*, *8*, 23–74.
Spielberger, C.D. (1980). *Preliminary Manual for the State-Trait Anger Scale (STAS)*. Tampa, FL: University of South Florida.
Suslow, T., & Junghanns, K. (2002). Impairments of emotion situation priming in alexithymia. *Personality and Individual Differences*, *32*, 541–550.
Taylor, G.J. (2000). Recent developments in alexithymia theory and research. *Canadian Journal of Psychiatry*, *45*, 134–142.
Taylor, G.J., & Bagby, R.M. (2004). New trends in alexithymia research. *Psychotherapy and Psychosomatics*, *73*, 68–77.
Van Dam-Baggen, C.M.J., & Kraaimaat, F.W. (1999). Assessing social anxiety: The Inventory of Interpersonal Situations (IIS). *European Journal of Psychological Assessment*, *15*, 25–38.

Van der Ploeg, H.M., Defares, P.B., & Spielberger, C.D. (1982). *Handleiding bij de Zelf-Analyse Vragenlijst, ZAV [Manual for the Self-Analysis Questionnaire, ZAV]*. Lisse, NL: Swets & Zeitlinger.

Vertommen, H., Verheul, R., Ruiter, C. de, & Hildebrand, M. (2002). *De herziene versie van Hare's Psychopathie Checklist (PCL-R) [The revised version of Hare's Psychopathy Checklist (PCL-R)]*. Lisse, NL: Swets Test Publishers.

Vitacco, M.J., Neumann, G.S., Caldwell, M.F., Leistico, A., & Van Rybroek, G.J. (2006). Testing factor models of the Psychopathy Checklist: Youth version and their association with instrumental aggression. *Journal of Personality Assessment*, *87*, 74–83.

Vorst, H.C.M., & Bermond, B. (2001). Validity and reliability of the Bermond-Vorst Alexithymia Questionnaire. *Personality and Individual Differences*, *30*, 413–434.

Woodworth, M., & Porter, S. (2002). In cold blood: Characteristics of criminal homicides as a function of psychopathy. *Journal of Abnormal Psychology*, *111*, 436–445.

Zech, E., Luminet, O., Rimé, & Wagner, H. (1999). Alexithymia and its measurement: Confirmatory factor analyses of the 20-item Toronto Alexithymia Scale and the Bermond-Vorst Alexithymia Questionnaire. *European Journal of Personality*, *13*, 511–532.

Zimmerman, G. (2006). Delinquency in male adolescents: The role of alexithymia and family structure. *Journal of Adolescence*, *29*, 321–332.

Zimmerman, G., Rossier, J., Meyer de Stadelhofen, F., & Gaillard, F. (2005). Alexithymia assessment and relations with dimensions of personality. *European Journal of Psychological Assessment*, *21*, 23–33.