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de Schutter, M.A.M.; Kramer, H.J.M.T.; Franken, E.J.F.; Lodewijkx, H.F.M.; Kleinepier, Tom

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Running Head: AGGRESSION OF PSYCHIATRIC PATIENTS

Title:

**The influence of Dysfunctional Impulsivity and Alexithymia on aggressive behavior of
Psychiatric Patients.**

Marja A. M. de Schutter^{a*}, Hein J. M. Th. Kramer^b, Ernest J. F. Franken^a, Hein F. M.
Lodewijkx^c and Tom Kleinepier^d

a.: Corresponding author*:

MSc Ir M.A.M. de Schutter*

Drs E.J.F. Franken

Emergis, Mental Health Care

Oostmolenweg 101,

4481 PM Kloetinge

The Netherlands

Phone: 00 31 113 267000

b.:

Drs H.J.M.Th. Kramer

Eleos, Mental Health Care

Printerweg 21-23,

3821 AP Amersfoort

The Netherlands

Phone: 00 31 88820250

c.:

Dr H.F.M. Lodewijkx

Open University

Faculty of Psychology and Educational

Sciences

Stationsweg 3A

4811 AX Breda

Phone: 00 31 76 5711608

d.:

Dr T. Kleinepier

Delft University of Technology

Faculty of Architecture and the Built

Environment

Mekelweg 2

2628 CD Delft

Phone: 00 31 15-2789111

*Correspondence:

M.A.M. de Schutter

Curamus, Elderly Health Care

Truffinoweg 2, 4561 NT Hulst

The Netherlands

T 00 31 114 381381

F 00 31 114 319088

E mdeschutter@curamus.nl

Abstract

Current approaches in Dutch mental health care institutions towards inpatients' aggression have focused predominantly on environmental factors, such as training the staff in aggression management. However, personality traits might be an important factor in patients' aggression – as shown by incidents in the wards. This study explores the influence of dysfunctional impulsivity and alexithymia on psychiatric patients' aggressive behavior, through self-reports and through involvement in aggressive incidents. Personality traits influencing patients' aggression emphasize the importance of a more direct approach to their aggression. Clinical patients at Dutch mental health care institution Emergis ($n = 84$) filled out questionnaires about their aggressiveness (using Buss and Perry's Aggression Questionnaire Short Form), dysfunctional impulsivity and alexithymia. Multiple regression analyses indicated that dysfunctional impulsivity positively related to self-reported aggressive behavior. The relationship, however, could not be confirmed for inpatients' aggression as reported by the staff on the wards. Unexpectedly affective alexithymia negatively related to hostility. Gender differences in self-reported aggression were found. Female patients showed higher levels of hostility. Regression analyses indicated that the male gender positively related to physical aggression. Findings emphasize the importance of a new approach in Dutch mental health care, in which patients may engage in aggression-regulation training programs.

Keywords: Aggression, Dysfunctional Impulsivity, Alexithymia, Psychiatric patients, Hostility.

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1. Introduction

1.1. Aggressive incidents

In the past decade, the aims of research on aggressive incidents in mental health care institutions have largely been limited to reducing the use of coercive measures (Noorthoorn et al., 2015; Vruwink et al., 2012; Steinert et al., 2010; Raboch et al., 2010; Bowers et al., 2006). The approach to aggressive incidents in mental health care institutions in the Netherlands, as manifested in the wards, has predominantly focused on the environment of the patient, e.g. through offering a friendly atmosphere at the ward and training the staff in risk assessment or other specific methods (Vruwink et al., 2012). Less research has focused on how personality traits of patients in mental health care influence their control of emotional arousal.

An emotional aggressive reaction is caused by personality traits and by aggression-arousing cues in the environment (Berkowitz, 1979; Frijda, 1999). Building on Berkowitz' theory on reactive (or emotional) aggression, many studies try to disentangle the role of personality variables associated with aggressive behavior. The five factor model (FFM; Costa & McCrae, 1992) and Gray's (1987) behavioral inhibition system / behavioral activation system (BIS/BAS) are prominent theories of personality dimensions, which contribute to our knowledge of the link between aggressive behavior and personality variables, like impulsivity. We will refer to these models in the next paragraph. Despite the development of many models and theories on aggressive behavior, however, a better understanding of the complex dynamics among personality variables, situational variables and aggressive behavior is still needed (Bettencourt et al., 2006).

In the present study we explore if personality traits of psychiatric patients in mental health care influence their self reported aggression and their incident involvement in the wards. In the sections that follow, we will first elucidate the way in which personality variables, specifically dysfunctional impulsivity and alexithymia, are related to aggressive behavior in (clinical) psychiatric patients. Then we will further explain the implications of influences of personality traits on improving the current intervention programs. And we present our hypotheses. This will be followed by a presentation and discussion of findings of our research.

1.2. Personality traits and aggression

Several studies on personality and aggression among psychiatric patients focused on personality disorders (e.g., psychopathy or borderline personality disorder) to identify patterns of traits or multidimensional traits that are associated with aggressive behavior. In adults having a borderline personality disorder (BPD) several positive relationships to higher levels of aggressive behavior have been found. These are higher levels of BPD symptoms (Herr et al., 2013), the presence of maladaptive coping mechanisms for emotional distress (Gardner et al., 2012) and poor emotion-regulating properties (Selby & Joiner, 2013). Related research, however, indicated that lower-order, unidimensional traits may provide more precision in identifying specific aspects of personality that are associated with aggression than patterns of traits in personality disorders or multidimensional traits do (Miller et al., 2012). For instance, externalizing behaviors in general (e.g. substance abuse and antisocial behavior) are associated to aggression and also strongly correlate to lower-order traits related to personal antagonism, poor impulse control and heightened negative emotionality. These lower-order traits can be associated with aggression as well (Miller et al., 2012).

First of all, impulsivity is an important personality trait that has been shown to enhance externalizing behaviors and aggression. Building on Gray's (1987) behavioral inhibition system / behavioral activation system (BIS/BAS), research revealed that a high BAS is associated with impulsivity in addition to a tendency to externalize problems (Bijttebier et al., 2009). Impulsivity itself, however, is not a unidimensional concept; its various components may be differently related to aggression. For example, a study of Miller et al. (2012), examining relationships between aggression and broad domains of personality variables, as included in the models FFM and BIS/BAS, revealed that two domains of traits which consistently related to aggression were: interpersonal antagonism and impulsivity-related traits. They further suggested that conscientiousness-related forms of impulsivity (i.e., failing to think of the consequences before acting) and neuroticism-related forms of impulsivity (i.e., acting impulsively when emotionally dysregulated) can be considered significant correlates of aggression. Consistent with these results, related studies revealed that the impulsivity traits that are most relevant to sexual aggression appeared to be the tendency to act impulsively when experiencing intense emotions, and when a lack of forethought and planning (premeditation) is present (Mouilso et al., 2013). Garcia-Forero et al. (2009) suggested a higher order variable, such as emotional processing, to mediate the relationship between aggressiveness and impulsiveness traits.

Dickman distinguishes two components of impulsivity: functional and dysfunctional impulsivity (Dickman, 1990; Claes et al., 2000). Functional impulsivity refers to a tendency to decide quickly when this style is optimal, whereas dysfunctional impulsivity relates to a tendency to make non-reflective decisions with negative consequences. Dysfunctional impulsivity in particular has been shown to be associated with aggression (Kumari et al., 2009). Similarly, Caprara et al. (2002) found a lack of self-regulatory efficacy, which enhances acting impulsively, to be associated to aggressive behavior. A study by Vigil-Colet et al. (2008) reported positive correlations between dysfunctional impulsivity and several scales of Buss and Perry's (1992) Aggression Questionnaire among different samples. Other studies also revealed strong relationships between dysfunctional impulsivity and aggressive tendencies both in the general population, among (forensic) psychiatric patients (Mudde et al., 2011) as well as among patients with a specific diagnosis, i.e., BPD, (Johnson et al., 2003) and schizophrenia (Kumari et al., 2009; Krakowski & Czobor, P., 2013).

Another construct related to aggressive behavior is alexithymia, which refers to a person's inability to reflect upon and to differentiate between emotions. Taylor et al. (1985) initially refer to four essential elements of alexithymia: (1) a reduction of or incapacity to experience emotions; (2) a reduction of or incapacity to verbalize emotions; (3) a reduction of or incapacity to fantasize; and (4) an absence of a tendency to think about one's emotions. A fifth element 'a difficulty in identifying emotions' was added as a new characteristic (Taylor et al., 1985). Building on these five elements of alexithymia Bermond and Vorst (2001) developed the Bermond Vorst Alexithymia Questionnaire (BVAQ), which distinguishes between an affective and a cognitive composite, respectively referring to a conscious awareness of the arousal of emotions versus a conscious interpretation of emotions. Alexithymia is implicated in a wide variety of psychological problems, such as depression, schizophrenia, autism spectrum disorder and obsessive-compulsive disorder (Samur et al., 2013; Ogrodniczuk et al., 2012; Daeyoung et al., 2011; Van 't Wout, 2006). Studies also revealed that alexithymia is indeed associated with aggressive behavior (Teten et al., 2008; Parry, 2012; Manninen et al., 2011).

In summary, we argue that specific components of impulsivity as well as traits involving dysregulation of emotions offer insight into psychiatric patients' aggressiveness. Of these traits, dysfunctional impulsivity and alexithymia appear to be most relevant, which is why we included these variables in our study.

1.3. Aim of this study

Personality traits influencing psychiatric patients' aggression emphasize the importance of a more direct approach to their aggression. For instance through attending aggression regulation programs or receiving treatment addressing specific personality traits.

Although patients' verbal or physical aggression, as manifested in the wards, can be severe and cause damage to persons or materials, it is seldom a (primary) treatment goal in mental health care institutions in the Netherlands. As stated in section 1.1. the present approach includes staff training and other environmental measures. It is debatable to what extent these measures contribute to the reduction of the incidence of aggressive acts. Noorthoorn et al. (2015) found positive effects on the duration – not the frequency - of specific coercive measures in psychiatry. A study in British mental health care institutions did not show a reduction in aggressive incidents after staff training programs (Bowers et al., 2006). Research of Heckemann et al. (2014) in acute hospital settings, found comparable results.

The broad introduction of environmental measures, was the response of the Dutch mental health care institutions to the government's demand in 2002 (IGZ) to reduce the application of coercive measures (e.g. seclusion). Coercive measures often had negative effects on patients' mental health or recovery in treatment (Stolker et al., 2004; Welles & Bij 't Vuur, 2009; Welles & Widdershoven, 2007). Notwithstanding the positive effects of the environmental measures (Lendemeijer, 2000), they fail to provide patients a more active role. Measures directly aimed at patients' own initiatives to control their aggressive impulses and to cope with their aggressive feelings themselves, could improve current intervention programs.

1.4. Hypotheses

In a sample of Dutch mental health care patients we expect that self-reported dysfunctional impulsivity will be positively related to aggression (hypothesis 1). We also expect alexithymia to be positively related to aggression (hypothesis 2). To cross-validate the level of inpatients' self-reported aggression, we additionally assessed the relationships between these scales and an Incident involvement measure, which consists of nursing staff's reports of aggressive incidents in the wards.

2. Method

2.1. Design and participants

To examine the hypotheses and research question, we designed a cross-sectional survey. Participants were inpatients of Emergis mental health care institution, located in the southwest of The Netherlands (Zeeland). We recruited participants from emergency departments, prolonged treatment departments, and protected housing communities. We approached 160 participants of which 93 (58%) were willing to participate in the research. Eighty-four participants (53% of the sample), answered the questionnaire and signed for permission to check their diagnoses and registered involvement in aggressive incidents. Nine questionnaires were incomplete; four of them were removed because responses were unreliable. Five questionnaires only lacked a signature so diagnoses and involvement in incidents remained unknown, but data on other variables could be used. Of these eighty-four participants, twenty-nine (35%) were recruited at emergency departments, thirty (36%) at prolonged treatment departments and twenty-five participants (30%) at protected housing communities. Forty-two (50%) men and forty-two (50%) women participated, with ages ranging from 18 to 77 years and a median of 37.5 years. Forty-four (52%) participants reported substance abuse.

The next diagnoses, according to the Diagnostic and Statistical Manual of mental disorders, version IV (DSM-IV), axis I applied to participants: Schizophrenia or other psychotic disorders ($n = 29$; 35%); anxiety or mood disorder ($n = 25$; 30%); pervasive developmental disorder (autism, Asperger's disorder or Pervasive Development Disorder-not otherwise specified (PDD-NOS)) ($n = 13$; 16%); and various other diagnoses, including the hyperactivity disorder and adjustment disorder ($n = 17$; 20%). Considering axis II of DSM-IV, the following diagnoses applied: Nineteen (23%) participants had a cluster B personality disorder (borderline personality disorder or antisocial personality disorder), while sixty-five (77%) participants did not have a cluster B personality disorder (e.g., no personality disorder at all or occasionally a cluster A or C personality disorder).

2.2. Procedure

The first author personally informed all participants about the background of the study. They then received a letter explaining the purpose and procedures of the study, requesting permission to use some of their personal (medical) records concerning their psychiatric diagnosis and registered data on involvement in aggressive incidents within their ward. The

participants were explicitly informed on the anonymous character of the research. Next, we requested them to fill out the questionnaire, which included items about their aggressiveness, impulsivity and alexithymia, and control variables such as demographic characteristics (age, gender) and substance abuse. Furthermore, participants indicated if they would be prepared to attend a training program as an intervention treatment to reduce aggressive behavior. We only included participants in the study after they gave full informed consent to derive personal information from their files and if they completed the questionnaire in full. The ethical committee of the Open University of the Netherlands supervised this research. According to the committee, the current study included neither medical invasive interventions nor psychological interventions that might have caused any harm to participants. Furthermore, both patients' advisory board and the medical staff of the Emergis Institution gave permission to conduct the research.

2.3. Instruments

The Buss and Perry Aggression Questionnaire Short Form. We measured aggression using the 'Aangepaste Versie van de Aggressie Vragenlijst' (AVL-AV), a Dutch translation of the Aggression Questionnaire Short Form of Buss and Perry (BPAQ-SF; Buss & Perry, 1992) (Hornsveld et al., 2009). This self-report questionnaire consists of twelve items that comprise four factors, each consisting of three items. Items are rated on a 5-point Likert scale ranging from (1) *entirely disagree* to (5) *entirely agree*. Examples of items per factor are: Physical Aggression – 'Once in a while I can't control the urge to strike another person.' Verbal Aggression – 'I often find myself disagreeing with people.' Anger – 'I flare up quickly but get over it quickly.' Hostility – 'At times I feel I have gotten a raw deal out of life.' Psychometric research showed good internal consistencies: Cronbach's α varied from 0.72 to 0.88 for three reference groups for the total scale AVL-AV. The concurrent validity of the AVL-AV is good (Hornsveld et al., 2009).

The Incident involvement measure. As already noted, to cross-validate inpatients' self-reported aggression, we also scrutinized available data on reported incidents of aggression at the wards of Emergis, labeled the Incident involvement measure. The nursing staff collected registrations of inpatients' involvement over a period up to three years. We assessed the value of the Incident involvement measure by counting the number of aggressive incidents per participant. Serious incidents, causing serious physical or psychological harm to other individuals, were counted as 'two', while less serious incidents, involving material damage or

no serious physical or psychological harm were counted as 'one'. In order to normalize the measure, we corrected for inpatients' frequency of hospitalization days. For those actually involved in incidents these varied from 76 days, spread over three separate periods in the included three years, up to the full three years.

The Dickman Impulsivity Inventory. We assessed dysfunctional impulsivity using the Dutch version of the Dickman Impulsivity Inventory (DII; Dickman, 1990; Claes et al., 2000). This validated instrument has two scales: Functional Impulsivity and Dysfunctional Impulsivity. Psychometric research shows a low correlation between the two subscales, indicating that separate traits are measured. The Dysfunctional Impulsivity scale consists of ten items, to be answered with a true (=1) / false (=0) answer format, such as 'I often say and do things without considering the consequences' and 'I frequently buy things without thinking whether or not I can really afford them.' The internal consistency of the scale is sufficient (Cronbach's $\alpha = 0.84$) and this also holds true for the concurrent validity (Claes et al., 2000).

The Bermond Vorst Alexithymia Questionnaire. We measured alexithymia by the Bermond Vorst Alexithymia Questionnaire (BVAQ), version 'Emotionele vaardigheid Jongeren (Emov-J)' (Vorst & Bermond, 2001)¹. The BVAQ consists of five subscales: Emotionalizing, Fantasizing, Identifying, Analyzing and Verbalizing. The two subscales Emotionalizing and Fantasizing constitute the proposed affective composite of alexithymia and the remaining three subscales make up the cognitive composite. Each subscale consists of eight items to be rated on a 5-point Likert scale ranging from (1) *entirely agree* to (5) *entirely disagree*. The items are either positively (pos.) or negatively (neg.) formulated in reference to the traits. Examples of item per subscale are: 'When something totally unexpected happens, I remain calm and unmoved' (neg., Emotionalizing). 'Before I fall asleep, I make up all kinds of events, encounters and conversations' (pos., Fantasizing). 'When I am distressed I know whether I am afraid or sad or angry' (pos., Identifying). 'I hardly ever go into my emotions' (neg., Analyzing) and 'I find it difficult to verbally express my feelings' (neg., Verbalizing). Psychometric research revealed good internal consistencies: Cronbach's α is 0.85 for the total scale and for the subscales the average value of Cronbach's $\alpha = 0.79$. The significant correlation, Pearson's $r = 0.80$, of the cognitive composite of BVAQ with the Toronto Alexithymia Scale (TAS-20; Taylor et al., 1985), which measures alexithymia's cognitive composite, is an indication for a good concurrent validity of BVAQ's cognitive composite (Vorst & Bermond, 2001).

¹ The version Emov-J of the BVAQ includes the same subscales, items per subscale and response formats as BVAQ. However, compared to BVAQ some items within Emov-J are less complicated in their use of words and grammar.

2.4. Analyses

Descriptive statistics. In preliminary analyses we computed descriptive statistics ($M \pm SD$) of the control variables, gender, age, addiction, hospital department and diagnoses (DSM IV, axis I and Axis II) and explored scale differences by computing one way Anova's. We then compared data of our sample to available normative data. As regards the AVL-AV, we used data of a validation study on the Short-Form Buss-Perry Aggression Questionnaire (BPAQ-SF) among US federal offenders (Diamond & Magaletta, 2006) and data of a study by Hornsveld et al. (2009) among various groups of clinical and ambulant violent male offenders ($N = 344$) and various groups of male teenagers ($N = 160$). We compared our scores on dysfunctional impulsivity to data of Claes et al. (2000) of a psychometric study to the DII among a general sample of Belgian adults ($N = 315$). We used BVAQ findings of Vorst and Bermond (2001) collected among Dutch university students ($N = 375$).

Correlations. We proceeded to inspect inter-correlations between the variables in an exploratory way, because this can give an indication of their relevance and power to influence the dependent variables. Moreover, correlations between the AVL scales and the Incident involvement measure will offer an indication of the validity of the latter. All correlations are Pearson's r , because the scales are either ordinal scales (AVL, BVAQ, and dysfunctional impulsivity, which consists of the sum of ten dichotomous items); or an interval scale (the Incident involvement measure).

Regression analyses. Lastly, we examined hypotheses using multiple regression analyses (backward method) using SPSS (v. 22). We conducted six analyses. In the first analysis, the total AVL scale served as the dependent variable; in subsequent analyses the AVL subscales and the Incident involvement measure served as the criterion, respectively. In all analyses the independent variables were similar: dysfunctional impulsivity, alexithymia's cognitive and affective composite and three control variables. These are age, gender and addiction, because they show substantial associations to other independent variables, either alexithymia's affective composite or dysfunctional impulsivity.

3. Results

In this section, we present the results of our study. In paragraph 3.1 descriptive statistics are provided for gender, showing significant differences on scale variables. In paragraph 3.2, we

show the correlations between all scale variables. Finally, in paragraph 3.3, multiple regression analysis was used to control for associations among the independent variables.

3.1. Descriptive statistics

In table 1 we present the descriptive statistics of our sample broken down by the control variable gender. Table 1 shows substantial associations for gender and respectively dysfunctional impulsivity, the affective composite of alexithymia and AVL Hostility. The other control variables – age, addiction, hospital department and DSM IV Diagnosis on axis I and axis II – only occasionally showed a significant difference on a scale variable. (A higher) age showed a significant association with (a higher level of) dysfunctional impulsivity $\eta^2 = 0.06$, $F(1,87) = 5.62$, $p < 0.05$.

Table 1: Means (*M*) Standard Deviations (*SD*) and group comparisons of variables broken down by Gender.

	Males <i>n</i> =43 <i>M</i> (<i>SD</i>)	Females <i>n</i> =46 <i>M</i> (<i>SD</i>)	<i>F</i>	<i>p</i>	η^2
Dysfunctional Impulsivity	2.58 (2.58)	4.07 (2.92)	6.42*	0.01	0.07
Alexithymia (total scale)	116.58 (11.17)	115.20 (17.20)	0.20	0.66	0.00
Alexithymia Cognitive composite	64.58 (12.01)	69.43 (15.14)	2.78	0.10	0.03
Alexithymia Affective composite	52.00 (8.19)	45.76 (9.17)	11.40**	0.00	0.12
AVL (total scale)	27.63 (9.62)	28.24 (9.22)	0.09	0.76	0.00
AVL Physical	7.16 (3.24)	5.96 (3.50)	2.83	0.10	0.03
AVL Verbal	6.05 (2.53)	5.67 (2.73)	0.44	0.51	0.01
AVL Anger	6.56 (3.48)	6.89 (3.16)	0.22	0.64	0.00
AVL Hostility	7.86 (3.43)	9.72 (3.45)	6.48*	0.01	0.07
Incident Involvement ^a	0.55 (1.14)	0.84 (2.29)	0.59	0.45	0.01

Notes: ^aMales: *N* = 42, Females: *N* = 42.

* $p < 0.05$, ** $p < 0.01$

The mean values on Dysfunctional Impulsivity as reported in Table 1 ($M = 2.58$ for men and 4.07 for women) are higher than the values reported by Claes et al. (2000; $M = 1.8$). Similarly, ratings relating to the Alexithymia total scale, $M = 115.9$, in our sample exceeded the ratings reported by Bermond and Vorst (2001) who found $M = 86.8$. Both differences were found to be statistically significant using an independent samples t-test, with both p values $<$

0.01. Some AVL ratings in our study (Anger Scale: $M = 6.55$ (males) and $M = 6.83$ (females) and Hostility Scale: $M = 9.67$ (females)) are higher than ratings of Diamond and Magaletta (2006) among US federal offenders (Anger scale: $M = 5.16$ (males) and $M = 4.06$ (females) and Hostility scale: $M = 7.89$ (females)). These differences also were found to be statistically significant, all p values < 0.01 . Finally, compared to Hornsveld et al. (2009), also using AVL-AV, we found lower scores on the Physical aggression scale (our study: $M = 7.17$; versus $M = 7.60$ for teenagers to $M = 9.31$ for violent forensic psychiatric outpatients (all males)). The difference of our sample compared to the psychiatric outpatients was found significant ($p < 0.01$), but compared to the teenagers no significance was found.

3.2. Correlations

Table 2 contains the results of analyses of the correlations (Pearson's r) between the variables dysfunctional impulsivity, the alexithymia scales and the aggression scales, obtained through self-reported aggression and through measuring participants' incident involvement.

Dysfunctional Impulsivity showed the expected relationships with the aggression scales and correlated positively with all self-report scales of aggression, but not with the Incident involvement measure. This result is partly consistent with our hypotheses.

The two alexithymia composites (but not the total scale) showed significant, but opposite, relationships with the AVL Hostility-scale. The Affective composite correlated negatively with the AVL Hostility scale and the Cognitive composite, showed a positive relationship with the AVL Hostility scale. Only this latter finding is in line with our hypothesis. The affective composite also shows significant negative correlations to the cognitive composite and to dysfunctional impulsivity.

Furthermore, we found a positive correlation between the AVL Physical Aggression scale and the Incident involvement measure. This finding validates the Incident Involvement measure.

Table 2: Intercorrelation of scales.

	Dys ^b Imp	Alex total	Alex Cog	Alex Aff	AVL ^{b,c} total	AVL ^{b,c} Phy	AVL ^{b,c} Ver	AVL ^{b,c} Ang	AVL ^{b,c} Hos	Incid ^c Inv
Dysfunctional Impulsivity	1.00									
Alexithymia (total scale)	-0.12	1.00								
Alexithymia Cognitive ^a	0.16	0.79**	1.00							
Alexithymia Affective ^a	-0.37**	0.39**	-0.26*	1.00						
AVL (total scale)	0.42**	-0.10	0.04	-0.21	1.00					
AVL Physical	0.22*	0.01	0.03	-0.03	0.73**	1.00				
AVL Verbal	0.32**	-0.14	-0.10	-0.07	0.70**	0.48**	1.00			
AVL Anger	0.37**	-0.16	-0.09	-0.12	0.83**	0.47**	0.48**	1.00		
AVL Hostility	0.31**	-0.02	0.22*	-0.37**	0.65**	0.16	0.20	0.45**	1.00	
Incident Involvement	0.03	-0.02	0.05	-0.11	0.07	0.27*	0.03	0.02	-0.10	1.00

Notes: ^a Alexithymia Cognitive = Cognitive composite of alexithymia; Alexithymia Affective = Affective composite of alexithymia. ^b Participants reported if they were being bothered with their own aggressive feelings: 'yes' or 'no'. These responses correlated positively and significantly to Dysfunctional Impulsivity (Spearman's $\rho = 0.22$, $p < 0.05$) and to all AVL scales (Spearman's ρ varied from 0.29 (AVL Hostility) to 0.49 (AVL Total scale), all $p < 0.01$). ^c Participants also indicated to what extent they would want to engage in an aggression regulation training program, rated on a 5-point Likert scale ranging from (1) *yes* to (5) *certainly not*. These responses correlated positively and significantly to all aggression scales (Pearson's $r = 0.24$ to 0.40 for the AVL scales, $p < 0.01$ and $r = 0.22$ for the Incident Involvement measure, $p < 0.05$).

* $p < 0.05$. ** $p < 0.01$.

3.3. Hypotheses

Table 3 summarizes findings of the regression analyses, using the backward method. We conducted six regressions, relating to the AVL total scale, the four subscales and the Incident involvement measure. First of all, findings revealed that that dysfunctional impulsivity showed the expected significant associations with most aggression scales, except for AVL Hostility and the Incident involvement measure. The associated standardized regression weights β reveal the association to be strongest for the AVL total scale. The association of dysfunctional impulsivity with hostility is not significant, but dysfunctional impulsivity does contribute to the total significant effect together with alexithymia's affective composite (table 3). In section 3.1 we described age to be positively associated with dysfunctional impulsivity, however, regression analyses showed no influence of age.

The effects of the alexithymia composites included only one significant association of the affective composite with AVL Hostility. The associated standardized regression weight $\beta = -0.29$, reveals that a higher self-reported affective alexithymia is associated with a lower level of AVL Hostility. This association is not in line with our hypothesis and opposite to the (not significant) associations of the cognitive composite. These findings are consistent with the correlations presented earlier.

In the association with the subscale AVL Physical aggression, besides dysfunctional impulsivity, gender also shows significance. Men report higher levels of physical aggression than women.

Finally, regression analyses revealed no significant associations of any of the independent variables to the Incident involvement measure. The strongest non-significant positive association was found for addiction.

Table 3: Results of the AVL total scale, AVL subscales and incident involvement measure regressed on variables predicting aggression ($N = 89$).

		B	β	p	F	R^2	$Adj. R^2$ ^b
AVL Total scale	dysfunctional impulsivity	1.38	0.42	0.00	18.50	0.18	0.17
AVL Physical	male gender	1.72	0.25	0.02	5.24	0.11	0.09
	dysfunctional impulsivity	0.35	0.29	0.01			
AVL Verbal	dysfunctional impulsivity	0.30	0.32	0.00	9.94	0.10	0.09
AVL Anger	dysfunctional impulsivity	0.43	0.37	0.00	13.61	0.14	0.13
AVL Hostility	affective composite ^a	-0.11	-0.29	0.01	8.87	0.17	0.15
	dysfunctional impulsivity	0.26	0.21	0.06			
Incident involvement ^c	addiction	0.49	0.14	0.21	1.61	0.02	0.01

Notes:

^a affective composite = affective composite of alexithymia; ^b $Adj. R^2$ = adjusted R^2 ; ^c $N = 84$

4. Discussion and conclusion

This study examined how two personality traits, i.e. dysfunctional impulsivity and alexithymia, are related to psychiatric patients' aggression as measured through self-reports and through incident involvement in the wards. Two hypotheses on expected positive relationships of both personality traits and aggression were formulated and subsequently tested. Our findings

confirmed the first hypothesis that increased levels of dysfunctional impulsivity would be significantly related to more self-reported aggressiveness, except for hostility. However, inconsistent with this hypothesis, a higher level of dysfunctional impulsivity was not associated with a higher incident involvement. With this measure, we independently assessed the frequency of aggressive incidents reported by the nursing staff in the wards. Conversely, however, the latter measure did show a significant correlation with the self-reported Physical aggression scale. Moreover, comparisons with normative data indicated that participants in our sample are characterized by relatively high levels of dysfunctional impulsivity. We argue that overall, these findings call for more attention to the personality trait 'dysfunctional impulsivity' when developing programs to restrain aggression in Dutch mental health care.

Inconsistent with our second hypothesis, findings revealed that increased levels of alexithymia were not associated with more aggressiveness. The cognitive composite of alexithymia indicates a positive association, whereas the affective composite showed an unexpected negative association. In a recent study, Velotti et al. (2016) found positive associations of alexithymia (cognitive composite; because measured by TAS-20) with aggression; this effect was found in a direct way in a community sample, and in an indirect way in a sample of psychiatric patients. Our study indicates similar results for alexithymia's cognitive composite, but it leaves the unexpected role of affective alexithymia undeclared. In our sample, deficits in the awareness of the arousal of emotions (affective alexithymia) were consistent with less hostility. Or emotional affective capacities (which is the opposite of affective alexithymia) are consistent with higher levels of hostility. Bermond et al. (2010) found higher stress responses in subjects with higher emotional affective capacities after seeing fear-inducing stimuli. Maybe this study and our study (both measuring affective alexithymia by BVAQ) are to be compared in this respect. They indicate that emotional affective capacities are associated to either a higher experience of negative (fear) emotions or to negative (hostile) thoughts. By far most studies to alexithymia reported in literature only include cognitive alexithymia and leave the role of affective alexithymia unexplored. We also found gender differences regarding affective alexithymia, insofar as women reported lower levels. Our findings suggest that future research should more thoroughly examine the complicated relationships, including the role of gender, between alexithymia and its components and psychiatric patients' aggression.

Our study shows higher female hostility levels. In the literature, higher female hostility is also reported in patients addicted to drugs (Bácskai et al., 2011) and diagnosed with a

depressive disorder (Prochazka & Agren, 2003). Both hostility and anger tap the cognitive aspects of aggression (Buss & Perry, 1992). Of these, hostility most strongly relates to internalizing emotional problems, which are associated with anxiety and depression (Morren & Meesters, 2002; Diamond & Magaletta, 2006). This would lead to an expected positive correlation of hostility with psychiatric patients diagnosed with an anxiety or mood disorder. This association was not found in our study, perhaps because we compared depressed and anxious patients to patients with other psychiatric diagnoses and not to the general population.

Our study shows another important effect of gender on self-reported aggression among psychiatric patients: men reported more physical aggression. In other studies, using BPAQ, this effect of the male gender was similar. (Abd-El-Fattah, 2013; Vigil-Colet et al., 2008; Condon et al., 2006; Prochazka & Agren, 2001).

4.1. Limitation and future directions

Limitation. Although our study provides interesting insights into the associations of dysfunctional impulsivity, alexithymia and gender with psychiatric patients' aggression, it also has some limitations. Obviously, the low number of participants ($n = 84$) strongly limits the generality of our results. In addition, our study may suffer from selection bias. Patients joined our study on a voluntary basis. It is conceivable that only patients took part that were able and willing to critically reflect on their own (aggressive) behavior, perchance leading to a distorted positive relationship between the variables we assessed. Furthermore, we used a cross-sectional design, which can result in biases that would not be present in a longitudinal design. Some participants might have, for example, had interactions with other participants at the wards during the research, and we know that aggressive behavior can incite aggressive reactions. Future longitudinal studies are recommended to explore the influence of personality traits on psychiatric patients' aggression both during hospital treatment and while not receiving treatment. Lastly, our study might also suffer from psychometric problems and instrument bias. For instance, the Incident involvement scale we developed is not [yet] validated. The measure with which we operationalized alexithymia (the BVAQ version Emov-J) differs from the original, validated version of BVAQ. To enable all participants to fill out this scale we intentionally reformulated some of the items in less complicated words or grammar and, once more, this may have led to biases in our measurements and findings.

Future directions. In this study we examined the influences of only two personality traits. We recommend to do further research among patients in mental health care to the role of other

personality traits, related to aggression in general, influencing their self-reported aggression and their incident involvement.

As stated in the introduction, we believe the influence of personality traits on patients' aggression emphasizes the importance of and need for a more direct approach to their aggression. To introduce this approach, we briefly explored how bothered patients feel about own aggressive feelings and the extent of their desire to engage in an aggression regulation training program (footnotes b and c in table 2). Their responses showed significant correlations to the aggression scales and respectively to dysfunctional impulsivity and to the Incident involvement measure. These interrelationships point to the existence of an association between patients' awareness of their aggressive feelings and behavior, and their preparedness to engage in aggression regulation therapy. Patients underscoring the relevance of attending aggression regulation programs is promising, however, more research has to be done to clarify more relevant factors influencing treatment readiness.

Several studies among violent offenders – often being more violent than aggressive patients in our study – show positive influences of treatment readiness on treatment persistence and outcome (Zalmanovitz et al., 2013; Alexander et al., 2010; Chambers et al., 2008). We believe patient participation in aggression regulation is the key to a future approach to psychiatric patients' aggression in Dutch mental health care.

In mental health care aggression-regulation treatment programs, as used in Dutch forensic psychiatry (Hornsveld et al., 2015; Hornsveld et al., 2004), should be adapted to meet the specific needs of their patients. Patients' dysfunctional impulsivity appears to be basic in this process. Furthermore, gender differences, such as high levels of hostility among female patients, should be addressed.

Findings of other research regarding the role of other personality traits on psychiatric patients' aggression (Velotti et al., 2016) and future research on personality traits and on the specific role of composites of alexithymia should be considered in developing future aggression regulation programs. Ultimately, patients may benefit from these programs and may learn to control their aggression both inside and outside the wards – that is, also while participating in society at large.

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