

# An adapted version of the Rosenzweig Picture-Frustration Study (PFS-AV) for the measurement of hostility in violent forensic psychiatric patients

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## ABSTRACT

**Background** *The original Rosenzweig Picture-Frustration Study (PFS), designed to measure reactive aggressive behaviour in adults, contains 24 pictures of ambiguous situations in which someone is making a remark that can be interpreted as provocative.*

**Aim** *An adapted version of Rosenzweig's PFS (PFS-AV) was developed to assess the hostile thoughts elicited by interpersonal frustrating situations in forensic psychiatric patients with a conduct disorder or an antisocial personality disorder.*

**Methods** *Patients were asked to give their responses in a few words on paper, which were then evaluated for hostility using a seven-point Likert scale. The patients also completed questionnaires on personality and on aggressive and socially competent behaviour.*

**Results** *Twelve of the 24 pictures that had a good internal consistency, inter-rater reliability, and test–retest reliability were selected. In support of the instrument's concurrent validity, scores on the PFS-AV were positively correlated with those on the aggressive behaviour questionnaires but less strongly than the correlations between the aggressive behaviour questionnaires mutually. The validity of the PFS-AV was demonstrated by the positive correlation between PFS-AV hostility and neuroticism, and by the negative correlation with extraversion, openness, agreeableness and conscientiousness. A relatively low but positive correlation was found with social anxiety and*

*a negative correlation was found with social skills in situations where approaching behaviour may be exhibited.*

**Conclusion** *The adapted version of the PFS-AV appears reliably and validly to measure hostility in violent forensic psychiatric patients. Copyright © 2007 John Wiley & Sons, Ltd.*

## Introduction

In recent years, forensic psychiatric institutions in the Netherlands have increasingly developed and implemented cognitive-behaviour therapy methods, including aggression control therapy, for violent forensic psychiatric patients (Hornsveld, 2004). This has necessitated the development of instruments to measure aggressive behaviour in order to evaluate these treatments. Examples of such instruments, which have been validated in a Dutch forensic psychiatric population, are the Observation Scale for Aggressive Behavior (OSAB; Hornsveld et al., 2006) and the Aggressie Vragenlijst (AVL; Meesters et al., 1996), a Dutch version of the Aggression Questionnaire (AQ; Buss and Perry, 1992).

Before the Aggression Questionnaire was developed, the Hostility Inventory (Buss and Durkee, 1957) was one of the most frequently used self-report questionnaires for measuring hostility. The Hostility Inventory had seven subscales, i.e. Violence, Indirect hostility, Irritability, Negativism, Resentment, Suspicion and Verbal hostility. Factor analysis of the Hostility Inventory yielded two factors: hostility as an attitude (Resentment and Suspicion) and hostility as overt behaviour (Violence, Indirect hostility, Irritability, Negativism, and Verbal hostility). These two factors were consistent with the distinction Blackburn (1993) made between the tendency to attribute negative intentions to others (hostility) and the tendency to assault others (aggression).

When developing the Aggression Questionnaire, Buss and Perry (1992) formulated new items based on the six components of the Hostility Inventory. Factor analysis of these new items yielded four factors: Physical aggression, Verbal aggression, Anger and Hostility. According to Buss and Perry, these factors represent three aspects of aggression: overt behaviour (physical and verbal aggression), emotion (anger) and cognition (hostility), with hostility described as 'feelings of hostile intent and injustice'.

Dodge (1986) and later Crick and Dodge (1996) discussed the relationship between hostile intention and aggressive behaviour using the 'social information processing' model. In this model, social behaviour is a function of successive steps of information processing: (1) encoding of the social situation, (2) interpretation of the social situation, (3) specification of goals, (4) generation of response alternatives, (5) evaluation of response alternatives and then selection of the optimum response, and (6) carrying out the selected response. According to Akhtar and Bradley (1991), these steps proceed differently in aggressive children than in non-

aggressive children, in that aggressive children more frequently fail to encode all the information available in social situations, more readily attribute hostile intentions to others, set inadequate goals for themselves, are unable to generate effective responses, display deficiencies in carrying out responses, and mainly consider their own short-term benefits. Coie and Dodge (1997) concluded therefore that aspects of 'social information processing' mediate between social influences and individual disposition and the risk of antisocial behaviour.

Graybill and Heuvelman (1993) postulated that they would find differences between aggressive and non-aggressive children in ratings of hostility for those items of the Children's Form of the Picture-Frustration Study in which the frustrator's intention is ambiguous. Their study confirmed the social information-processing model of aggression, namely, that without cues as to the intent of the frustrator, aggressive children's bias towards assuming hostile intent is activated and the children respond more aggressively than non-aggressive children.

When aggression control therapy was introduced in 2000 (Hornsveld, 2004), there was no Dutch questionnaire for measuring hostility in adolescent and adult forensic psychiatric patients. We therefore developed a questionnaire that would be sufficiently sensitive to measure changes in the 'hostile intent of a frustrator in interpersonal situations', based on the pictures of the Picture-Frustration Study (PFS) of Rosenzweig (1978). We chose the PFS because the reactions to the pictures have to be written down, which reveals the hostile thought content of respondents more directly than if respondents have to rate their response on a Likert scale. The PFS is based on the psychodynamic theory that frustration of basic needs can lead to aggression. The child as well as the adult version of the test consists of 24 cartoon-like pictures. The figure on the left in each picture makes statements that either help to describe the frustration of the other individual or frustrate him/her. The person on the right is shown with a blank caption box above. Subjects are instructed to examine the situations one at a time and write in the blank box the first appropriate reply that enters their mind. Each response is scored according to its similarity to 11 types of response defined in the manual. According to Rosenzweig's frustration-aggression theory, scores on these 11 response types are then combined to form six categories of aggression: three directions of aggression and three types of aggression. Aggression may be directed towards the environment (extrapunitive), oneself (intropunitive), or evaded (impunitive). The types of aggression are attending to the frustrating barrier (obstacle-dominance), defending the organization of personality (ego-defence), or finding solutions (need-persistence).

We here describe the development of an adapted version of the PFS (PFS-AV) for the measurement of hostility in violent forensic psychiatric patients. For this purpose, we define hostility as the tendency to ascribe hostile intentions to others in interpersonal situations, aggressive behaviour as all behaviour that results in injury to others, and violence as aggressive behaviour that involves the use of physical force (Browne and Howells, 1996). We consider irritation, anger and rage

as emotions exhibited in response to (supposed) provocations, as manifested by actions such as staring too long, speaking too loudly and standing too close, and define anxiety and gloominess as moods that last for a longer period and which are expressed by behaviours such as restlessness, complaining and lack of initiative. A personality trait concerns one of the 'Big Five' psychological personality domains (Hoekstra et al., 1996), while the terms oppositional defiant disorder and conduct disorder refer to a medical-psychiatric classification on axis I and the term antisocial personality disorder to a classification on axis II of the DSM-IV (American Psychiatric Association, 1994). One of the criteria of all three classifications is that verbally and/or physically aggressive behaviour is exhibited on a regular basis.

*An adapted version of the Picture-Frustration Study (PFS-AV)*

The pilot version of the questionnaire contained the 24 pictures of the adult version of the PFS (Hörmann and Moog, 1957) and was completed by 24 violent forensic psychiatric patients with an antisocial personality disorder as a main diagnosis on axis II (DSM-IV: American Psychiatric Association, 1994). In order to calculate inter-rater reliability, subjects were asked to write down 'what they would say in return' and two researchers independently evaluated the patients' answers in terms of hostility attributed to the frustrator, using a seven-point Likert scale with the following scoring possibilities: 1 = absent, 2 = minimal, 3 = some, 4 = moderate, 5 = strong, 6 = very strong, and 7 = extreme. The total correlation of the 24-item pilot version was 0.72 ( $p < 0.01$ ), but this increased to 0.77 ( $p < 0.01$ ) after removal of the seven items with the lowest correlation coefficients. The internal consistency (Cronbach's  $\alpha$ ) of the 17-item version for these 24 patients was 0.83.

We administered the 17-item pilot version to 93 inpatients and 138 outpatients due to receive aggression control therapy (Hornsveld, 2004). The inpatients had been admitted to six forensic psychiatric hospitals<sup>1</sup> following their conviction for serious violent crimes. The average age of the inpatients was 32.7 years (SD = 7.6; range = 21–56 years). Their main diagnosis was an antisocial personality disorder on axis II or a psychotic disorder on axis I, combined with an antisocial personality disorder on axis II (DSM-IV: American Psychiatric Association, 1994). The chronic psychiatric condition of the psychotic patients had stabilized to the extent that their personality disorder became prominent. The outpatients were treated at the forensic psychiatry outpatient clinic as stipulated by the sentence for their violent crimes.<sup>2</sup> The average age was 21.9 years (SD = 8.0; range = 16–48 years). The outpatients had an oppositional defiant or conduct disorder on axis I or, if they were 18 years or older, an antisocial personality disorder on axis II as main diagnosis (DSM-IV: American Psychiatric Association, 1994).

Of the patients administered the pilot version of the PFS-AV before the start of treatment, 92 had also completed it just after the intake interview, on average

four weeks earlier. Test–retest calculations showed that the two scores for five of the 17 items were not correlated. These items were removed from the questionnaire. We then evaluated the construct validity of the 12-item version, using factor analysis (using oblimin rotation of main axes) of the data from all 231 forensic psychiatric patients. There were two highly overlapping factors: factor 1, in which those involved were blamed (eight items) and factor 2, in which an absent third person was blamed (four items). Since seven of the 12 items had weightings higher than 0.40 on these two factors, we decided to use a structure with one factor (see Table 1).

The internal consistency (Cronbach's  $\alpha$ ) of the 12-item PFS-AV was 0.76 ( $n = 231$ ) and its test–retest reliability was 0.66 ( $p < 0.01$ ) for the 92 outpatients who completed the pilot version of the PFS-AV directly after the intake and again at the beginning of the therapy. The inter-rater reliability of the 12-item PFS-AV was 0.77 ( $p < 0.01$ ) for the 24 patients who completed in the 24-item pilot version of the PFS-AV.

### *Validity of the Picture-Frustration Study – Adapted Version (PFS-AV)*

#### Patients and procedure

To establish the concurrent validity of the questionnaire, we determined whether scores on the 12-item PFS-AV were correlated with scores on the PCL-R (Hare,

Table 1: Means, standard deviations and factor loadings of the items ( $n = 231$ )

Item	Picture	M	SD	Factor loading	
				1	2
12	23	2.89	1.54	<b>0.67</b>	0.06
4	10	3.86	1.78	<b>0.63</b>	0.42
10	16	2.85	1.87	<b>0.60</b>	0.49
11	17	2.74	1.70	<b>0.56</b>	0.13
5	11	2.71	2.06	<b>0.55</b>	0.07
1	4	2.82	1.67	<b>0.53</b>	0.53
7	13	3.39	1.67	<b>0.51</b>	0.47
2	5	2.18	1.51	<b>0.51</b>	0.35
9	15	2.37	1.73	0.01	<b>0.61</b>
8	14	2.49	1.51	0.42	<b>0.61</b>
3	8	3.15	1.94	0.23	<b>0.60</b>
6	12	2.89	1.54	0.17	<b>0.53</b>

Note: Factor 1: Reproaches to the person involved; factor 2: Reproaches to an absent person. Factor loadings  $> 0.50$  are printed in bold.

1991; Dutch version by Vertommen et al., 2002) and with self-report questionnaires for personality traits, aggressive behaviour and socially competent behaviour. This study involved 147 forensic psychiatric inpatients (the 93 inpatients of the former study included) and 138 forensic psychiatric outpatients (the same as in the former study), all with a history of violent crimes. The average age of the inpatients was 35.5 years (SD = 8.8; range = 21–63 years). These patients received aggression control therapy or usual hospital care. The average age of the outpatients was 21.9 years (SD = 8.0; range = 16–48 years). Although we asked all patients to complete the standard set of questionnaires, a number of patients did not. In addition, PCL-R scores were not available for inpatients admitted to a hospital in which this instrument was not routinely used.

## Measures

The *Psychopathy Checklist-Revised* (PCL-R; Hare, 1991; Dutch version: Vertommen et al., 2002) is a checklist for measuring psychopathy and is completed on the basis of a structured interview and a file study (Cronbach's  $\alpha$  0.79). The checklist has two factors: 'egotism, insensitivity and using others without remorse' (Factor 1) and 'chronically unstable and antisocial behaviour' (Factor 2).

The *NEO-Five Factor Inventory* (NEO-FFI; Costa and McCrae, 1992; Dutch version: Hoekstra et al., 1996) is a 60-item, self-report measure of the Big Five personality domains of neuroticism, extraversion, openness, agreeableness, and conscientiousness (Cronbach's  $\alpha$  0.84, 0.73, 0.66, 0.68 and 0.69 successively).

The *Zelf-Analyse Vragenlijst* (ZAV; Van der Ploeg et al., 1982) is a Dutch version of the Spielberger State-Trait Anger Scale (Spielberger, 1980). Ten trait items were used from this questionnaire to determine disposition to anger (Cronbach's  $\alpha$  0.83).

The *Agressie Vragenlijst* (AVL; Meesters et al., 1996) is a Dutch version of Buss and Perry's (1992) Aggression Questionnaire with 29 items (Cronbach's  $\alpha$  0.86) that measure various types of aggressive behaviour, i.e. physical aggression, verbal aggression, anger and hostility (Cronbach's  $\alpha$  0.79, 0.51, 0.60 and 0.70 successively).

The *Novaco Anger Scale* (NAS; Novaco, 1994) used in this study was a translation of a provisional version with 48 items in part A and 25 items in part B. Patients had to complete only part A, where they indicated the extent to which an anger-inciting situation had a bearing on them (Cronbach's  $\alpha$  0.95).

The *Inventarisatielijst Omgaan met Anderen* (IOA; Van Dam-Baggen and Kraaimaat, 2000; IIS: Van Dam-Baggen and Kraaimaat, 1999). Patients evaluated 35 interpersonal situations, indicating how much anxiety they would experience (Social anxiety; Cronbach's  $\alpha$  in this study was 0.96) in these situations and then how often they would actually perform the behaviour described (Social skills; Cronbach's  $\alpha$  was 0.92) if the situation occurred. The five subscales in this questionnaire, for both social anxiety and social skills, are: giving criticism; giving



your opinion; giving someone a compliment; making contact; and appreciating yourself. Two *a priori* subscales were designed for this study: The 'Boundary-setting behaviour' subscale consists of the 'giving criticism' and 'giving your opinion' subscales, and the 'approaching behaviour' subscale consists of the 'giving someone a compliment' and 'making contact' subscales.

The *Observation Scale for Aggressive Behavior* (OSAB: Hornsveld et al., 2006) was used to record behaviour in the participating psychiatric hospitals. The scale was developed for forensic psychiatric patients, has 40 items, and contains the subscales irritation/anger, anxiety/gloominess, aggressive behaviour, antecedent, sanction, and social behaviour (Cronbach's  $\alpha$  0.82, 0.79, 0.79, 0.82, 0.63 and 0.93 successively). The ward staff completed the scale based on the behaviour displayed during the previous week.

## Results

To investigate the questionnaire's concurrent validity, the total PFS-AV score was correlated with scores on the PCL-R, NEO-FFI, ZAV, AVL, NAS, IOA and OSAB. As shown in Table 2, the PFS-AV total was not significantly correlated with the total score or the scores for the two factors of the PCL-R. The PFS-AV total score was positively correlated with scores on the neuroticism subscale of the NEO-FFI, and negatively correlated with scores on the four other subscales of extraversion, openness, agreeableness, and conscientiousness. The score on PFS-AV total was positively correlated with scores on the aggressive behaviour instruments (ZAV-D, AVL and NAS-A). Consequently, there was support for the expectation that hostility measured with the PFS-AV was associated with aggressive behaviour; however, the correlations between the PFS-AV and the aggressive behaviour instruments were relatively lower than those between the three other instruments (ZAV-D – AVL total: 0.58; ZAV-D – NAS-A: 0.56; AVL total – NAS-A: 0.75).

In line with expectations, the total score on the PFS-AV was weakly but positively correlated with scores for social anxiety (IOA-S total), primarily in situations involving approaching behaviour. Similarly, the correlations between the PFS-AV total score and the social skills (IOA-F total) score was as expected, with there being a weak, negative correlation with the total score and a weak, more strongly negative correlation with the 'approaching behaviour' subscale score.

Correlations between the PFS-AV total score and the OSAB subscale scores were not significant in all cases (irritation/anger = 0.02; anxiety/gloominess = -0.12; aggressive behaviour = 0.11; social behaviour = -0.08;  $n = 147$ ). Hence, our expectation that a hostile attitude in inpatients would be correlated positively with aggressive behaviour and negatively with social skills was not supported.

In a final analysis, the relation between personality characteristics (NEO-FFI, PCL-R and ZAV-D) and problem behaviours (PFS-AV, AVL, NAS-A and IOA)

Table 2: Correlations between PFS-AV and PCL-R, and between PFS-AV and questionnaires (n = 285)

Measurement instrument	Factor or subscale	PFS-AV
Age		-0.20** (273)
PCL-R	Total	-0.01 (251)
	Factor 1	-0.06 (236)
	Factor 2	0.08 (236)
Neo-FFI	Neuroticism	0.13* (274)
	Extraversion	-0.16** (274)
	Openness	-0.19** (274)
	Agreeableness	-0.39** (274)
	Conscientiousness	-0.20** (274)
ZAV	Disposition to anger	0.32** (270)
AVL	Total	0.46** (277)
	Physical aggression	0.43** (277)
	Verbal aggression	0.40** (277)
	Anger	0.40** (277)
	Hostility	0.33** (277)
NAS	Part A	0.49** (278)
	Total	0.13* (260)
IOA, Social anxiety	Boundary-setting behaviour	0.05 (260)
	Approaching behaviour	0.16** (260)
IOA, Social skills	Total	-0.15* (267)
	Boundary-setting behaviour	-0.06 (267)
	Approaching behaviour	-0.21** (267)

Notes: \* $p < 0.05$ ; \*\* $p < 0.01$  (two-tailed; number of participants in parentheses). PCL-R = Psychopathy Checklist-Revised, NEO-FFI = NEO Five Factor Inventory, ZAV = Zelf-Analyse Vragenlijst, AVL = Agressie Vragenlijst, NAS = Novaco Anger Scale, IOA = Inventarisatielijst Omgaan met Anderen.

was further investigated with an exploratory factor analysis (using oblimin rotation of main axes and eigenvalue 1) of the data from all 285 patients. Four factors were identified (see Table 3): (1) antisocial attitude (agreeableness, conscientiousness, ZAV-D, AVL and PFS-AV), (2) psychopathy (PCL-R Factor 1 and Factor 2), (3) social competence (neuroticism, extraversion, IOA social anxiety, and IOA social skills), and (4) openness. Most instruments loaded mainly on one factor and the PFS-AV was part of the same factor as the instruments for aggressive behaviour.

## Discussion

A pool of 24 pictures from Rosenzweig's Picture-Frustration Study, in which someone is depicted making a remark that can be interpreted as provocative, was



Table 3: Factor loadings of the scores on PCL-R factors and questionnaires (n = 285)

Measurement instrument	Factors			
	1	2	3	4
AVL Total	<b>0.82</b>	-0.06	-0.25	0.10
ZAV-D	<b>0.75</b>	0.04	-0.15	0.06
NEO-FFI, Agreeableness	<b>-0.74</b>	-0.08	0.38	-0.02
PFS-AV	<b>0.66</b>	-0.03	-0.09	-0.22
NEO-FFI, Conscientiousness	<b>-0.54</b>	-0.21	0.37	0.20
PCL-R Factor 2	0.21	<b>0.80</b>	0.18	0.10
PCL-R Factor 1	-0.23	<b>0.77</b>	-0.02	0.03
IOA Social skills	-0.07	0.04	<b>0.76</b>	0.23
IOA Social anxiety	0.26	-0.12	<b>-0.70</b>	0.02
NEO-FFI, Neuroticism	0.59	-0.05	<b>-0.64</b>	0.41
NEO-FFI, Extraversion	-0.39	-0.23	<b>0.56</b>	-0.25
NEO-FFI, Openness	-0.19	0.08	0.15	<b>0.85</b>

Notes: Factor 1: Antisocial attitude, factor 2: Psychopathy, factor 3: Social competence, factor 4: Openness. PCL-R = Psychopathy Checklist-Revised, NEO-FFI = NEO Five Factor Inventory, ZAV = Zelf-Analyse Vragenlijst, AVL = Agressie Vragenlijst, NAS = Novaco Anger Scale, IOA = Inventarisatielijst Omgaan met Anderen.

reduced to 12 based on inter-rater and test–retest reliability. As expected, the scores on the PFS-AV and those on the aggressive behaviour questionnaires were significantly and positively correlated, supporting the concurrent validity of the PFS-AV. Correlations were found to be lower than normal between the aggressive behaviour questionnaires mutually. The validity of the PFS-AV was further supported by a significant positive correlation to neuroticism and by significant negative correlations to hostility and extraversion, openness, agreeableness and conscientiousness. There was also a relatively low but positive correlation with social anxiety and a negative correlation with social skills in situations in which approaching behaviour may be exhibited. Hostility as measured by the PFS-AV appeared to be part of a general antisocial factor, on which aggressive behaviour loaded positively, and agreeableness and conscientiousness negatively. Contrary to expectations, we did not find hostility and aggressive or prosocial behaviour on the ward to be correlated in the inpatients. This might be because inpatients may have wanted to make a more favourable impression on the ward staff.

Patients easily understood the simple statement made by the person on the left of the picture and had no difficulty writing an appropriate response. Because a research assistant scored their written answers, patients did not need to deliberate on which score on a Likert scale was the most appropriate response. We felt that writing down a reaction provided a more direct reflection of a patient's hostile thoughts than if he/she was 'distracted' by having to award feelings a score on a Likert scale.

The relatively low correlation between PFS-AV hostility and the Aggression Questionnaire hostility subscale, in comparison with the other three subscales of the questionnaire, was striking. We consider that the items of the hostility subscale of the Aggression Questionnaire refer more to feelings of being wronged or to resentment than to a more or less hostile attitude in interactions with others. It would be interesting in a future study to investigate the relation between the PFS-AV and other instruments for hostility, for instance the 10 items of the PICTS, which load on the factor 'interpersonal hostility' (Walters, 2005).

Coie and Dodge (1997) concluded, from studies of aggressive and 'normal' children, that hostility and aggressive behaviour are associated. Our findings support this conclusion but not for adolescent and adult violent forensic psychiatric patients. In this population, hostility appeared to contribute to aggressive behaviour, probably because patients seem to avoid alternative prosocial behaviours. Hornsveld (2006) found in a preliminary study that a group of violent forensic psychiatric patients differed from the general Dutch population by exhibiting 'boundary-setting' behaviour more often and 'approaching behaviour in social situations' less often. In addition, the PFS-AV scores of a group of adolescent patients were different from those of a group of 'normal' low-educated boys, while no differences were found on self-report measures for aggressive behaviour. The tendency to ascribe hostile intentions to others and the limited repertoire of prosocial skills would appear to be characteristic of violent forensic psychiatric patients.

In summary, the PFS-AV appears to be a promising instrument for measuring hostility in forensic psychiatric patients. The first evaluation of its psychometric properties shows that the instrument has an adequate to good reliability and validity. This instrument is therefore a useful addition to current instruments for evaluating treatment programs designed to reduce aggressive behaviour in violent forensic psychiatric patients.

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1. De Kijvelanden Forensic Psychiatric Hospital at Poortugaal, De Singel TBS Hospital (currently Flevo Future, Amsterdam branch), Dr F.S. Meijers Hospital (currently Flevo Future, Utrecht branch), De Rooyse Wissel Forensic Psychiatric Hospital at Oostrum (L), Forensic Psychiatric Department of the Drenthe Mental Health Agency at Assen and Dr S. van Mesdag Hospital at Groningen.
2. Het Dok Outpatient and Day Clinic in Rotterdam.

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