Is reflective functioning associated with clinical symptoms and long-term course in patients with personality disorders?

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Abstract

Objective: Mentalization is the capacity to understand behavior as the expression of various mental states and is assumed to be important in a range of psychopathologies, especially personality disorders (PDs). The first aim of the present study was to investigate the relationship between mentalization capacity, operationalized as reflective functioning (RF), and clinical manifestations before entering study treatment. The second aim was to investigate the relationship between baseline RF and long-term clinical outcome both independent of treatment (predictor analyses) and dependent on treatment (moderator analyses).
Methods: Seventy-nine patients from a randomized clinical trial (Ullevål Personality Project) who had borderline and/or avoidant PD were randomly assigned to either a step-down treatment program, comprising short-term day-hospital treatment followed by outpatient combined group and individual psychotherapy, or to outpatient individual psychotherapy. Patients were evaluated on variables including symptomatic distress, psychosocial functioning, personality functioning, and self-esteem at baseline, 8 and 18 months, and 3 and 6 years.
Results: RF was significantly associated with a wide range of variables at baseline. In longitudinal analyses RF was not found to be a predictor of long-term clinical outcome. However, when considering treatment type, there were significant moderator effects of RF. Patients with low RF had better outcomes in outpatient individual therapy compared to the step-down program. In contrast, patients in the medium RF group achieved better results in the step-down program.
Conclusion: These findings indicate that RF is associated with core aspects of personality pathology and capture clinically relevant phenomena in adult patients with PDs. Moreover, patients with different capacities for mentalization may need different kinds of therapeutic approaches.
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1. Introduction

Competing interests: The authors declare that they have no competing interests.

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Deficits in mentalizing capacities are believed to play an important role in a range of psychopathologies [1]. Mentalization is defined as the capacity to understand and interpret—implicitly and explicitly – one's own behaviors and those of others as expressions of mental states such as feelings, fantasies, beliefs, and desires [2]. The concept refers to complex bio-psycho-social phenomena that are not easily measured [3]. Over the last two decades, the mentalization construct has been operationalized as reflective functioning (RF) with a scoring manual for application to the Adult Attachment Interviews (AAI) [4,5], assessing mentalizing ability based on the individual's narratives of his/her childhood attachment experiences. This method measures mentalizing related to attachment relationships and expresses

RF as a single global score. Recent investigation has shown satisfactory construct validity and psychometric properties of the RF scale applied to AAI [6], and the measure is currently seen as the gold standard for measuring RF.

Several studies applying different methodologies have investigated whether low levels of RF are related to psychiatric disorders like substance abuse [7,8], depression [9–11], anxiety disorders [12], eating disorders [13,14], and psychosis [15]. The findings from these studies are inconsistent regarding whether RF in such samples deviates from RF levels believed to characterize the normal population. A recent review of the RF literature concludes that the evidence for the association between RF and severity of symptoms for different psychiatric disorders is inconclusive [16].

Mentalizing deficits have been proposed to represent a core mechanism in personality disorders (PDs), particularly borderline PD (BPD). Mentalization capacity is assumed to buffer against psychopathology in individuals exposed to trauma and abuse and to relate to more adaptive affect regulation and interpersonal functioning [17–20]. A few empirical studies have found low levels of RF in samples of BPD. In a study of Fonagy and colleagues [14] patients with BPD had low RF compared with a non-clinical control group, as well as compared with other PDs. The relationship between low RF and BPD, however, was mainly apparent in the presence of childhood abuse, supporting RF as a protective factor. RF levels close to those of the BPD population in Fonalgy et al's study [14] have also been reported in BPD patients in two separate treatment studies [21,22]. However, there have been divergent findings regarding mentalizing abilities in subject with BPD, depending on experimental context. Whereas some studies, applying other methods to assess mentalizing, provide evidence that BPD displays inferior mentalizng capacity, other studies show that subjects with BPD in fact exhibit a superior ability to mentalize [23].

Moreover, a recent report described BPD patients as not differing from those with other PDs; both groups had low RF compared to non-psychiatric controls [19]. Thus, mentalization deficits may extend to PDs other than BPD. Mentalization is a multifaceted concept [3], and different types of PD could be associated with specific mentalizing problems. Although more research is required, it is hypothesized that subjects with BPD have particular mentalizing difficulties in the context of attachment relationships and high emotional arousal [18] whereas subjects with cluster C PDs like avoidant PD (AvPD) may have poor access to own and others states of mind on a more general basis, in part related to poor awareness and tolerance of affects [24–26].

Despite increasing interest in RF as a theoretically and clinically meaningful aspect of PD, few studies have investigated how RF is associated with clinical manifestations of PD psychopathology in terms of symptom distress and psychosocial or personality functioning. An association among hypermentalizing (i.e., excessive but inaccurate mentalization), as assessed by the Movie for the Assessment of Social Cognition [27], BPD traits, and self-reported difficulties in emotion regulation was found in an inpatient adolescent sample [28]. Chiesa et al. [19] found that RF was negatively correlated with self-reported symptom distress in their mixed PD and non-psychiatric sample. No study has so far investigated RF and everyday psychosocial function in clinical PD samples; however, in a population of unemployed, low-income, and disadvantaged adults in New York who participated in a job-readiness training program, those with higher RF more seldom had PDs and were more likely to complete the program and attain a job [29].

Two studies that examined associations between RF and severity of psychopathology in terms of the number of Axis I and Axis II disorders reported inconsistent results. The first, by Bouchard and colleagues [30], included subjects from both clinical and non-clinical populations and indicated that RF was negatively correlated with the number of Axis I and Axis II disorders. Such correlations were not confirmed in the more recent treatment study of Fisher-Kern et al. [22]. On the other hand, Fisher-Kern et al. [22] reported among their BPD patients an association between RF and level of personality organization, as assessed by the Structured Interview of Personality Organization (STIPO [31]). STIPO is based on Kernberg's psychodynamic conceptualization of differentiation and integration of internal representations of self and others, and covers several domains that are central to personality functioning such as identity consolidation and quality of object relations [32,33]. Thus, our knowledge of how RF may relate to mental distress, extent of psychopathology as well as degree of maladaptive personality functioning is still scarce. Clearly, more studies are needed to evaluate the clinical implication of mentalization deficits.

Psychosocial treatment, including psychotherapy, is considered the main treatment approach for patients with PDs [34,35], yet there seems to be substantial variation within this patient group regarding the degree of benefit gained from psychotherapy [36]. Information on factors predicting the outcome of therapy could facilitate identification of those at risk for poor outcome and enable identification of helpful therapy processes [37]. Studies of psychological mindedness and alexithymia tend to show that patients with poor abilities to understand the psychological meaning underlying emotional experiences and behaviors in self and others may have a less favorable outcome [38,39]. Given that RF, psychological mindedness and alexithymia are closely related through processes concerning recognition and thinking about one's own or other's internal states [25], such results point towards RF as a potential predictor of clinical course. Yet, although therapies addressing mentalizing deficits seem to reduce self-harm, general symptoms, interpersonal distress, and personality pathology in patients with BPD [21,40–43], few studies have examined whether mentalizing capacities at the onset of treatment predict clinical outcome in patients with PDs. The results from two treatment studies that included patients with eating disorders [44] or depression [10] were inconsistent as regards the predictive value of RF for outcome of three months of inpatient treatment and long-term psychoanalytic treatment, respectively. Thus, the general predictive value of RF remains uncertain.

The possibility exists, however, that the influence of RF on treatment outcome varies according to treatment type and format. Some treatment approaches may be more challenging for patients with poor mindreading abilities. As an example, patient's mentalizing deficits could influence their capacity to engage in group psychotherapy focusing on exploration and interpretation of internal states and interpersonal dialogues, and consequently affect therapeutic benefits. Whereas a predictor influences outcome regardless of treatment characteristics, a moderator differentially influences outcome depending on the type of treatment. Given the variety of PD treatment options, an important question is how mentalizing capacities may moderate outcomes under different treatment conditions.

The Ullevål Personality Project (UPP) is a randomized clinical trial designed to compare outcomes of two of the most common treatment modalities for PD patients in Europe and Norway at that time: (1) a step-down program, which in this project comprised short-term day-hospital treatment followed by a combination of long-term group and individual psychotherapy for a maximum of 4 years, and (2) outpatient individual psychotherapy. The patients were evaluated on a wide range of outcome variables at baseline and later follow up investigations at 8 months, 18 months, and 3 and 6 years after the initial random assignment. The analyses at the 6-year follow-up showed no difference in outcome between treatment conditions in the total mixed PD sample, although the clinical course did differ between treatments [45]. In the previous 3-year follow-up investigation, differentiating between patients with low and medium pretreatment RF levels yielded significant results [46]. Patients with low RF had greater improvements in psychosocial functioning in the outpatient condition than in the step-down condition. For patients with medium/high RF, 3-year outcomes did not differ by treatment condition. So far, this study is the only one to report a moderator effect of RF on clinical outcomes of psychotherapeutic treatment. The value of such findings is considerably strengthened if these effects can be demonstrated to be long term.

The aim of the present study was twofold. The first aim was to investigate the relationship between mentalization capacity operationalized as RF and clinical manifestations before entering study treatment. The second aim was to investigate the relationship between baseline levels of RF and long-term outcomes. More specifically, we addressed three research questions: (1) What were the associations between RF and psychosocial functioning, symptom distress, interpersonal problems, self-esteem, and personality functioning at baseline? (2) Did baseline levels of RF predict clinical outcome at 6 years of follow-up? (3) Were baseline levels of RF a moderator of long-term treatment effects, and if so, what were the magnitudes of these clinical differences?

2. Methods

2.1. Setting and design

The UPP was conducted at the Department of Personality Psychiatry (DPP) at Oslo University Hospital. The State Health Insurance Fund covered the expenses for both treatment conditions. Patients were evaluated before treatment, and after 8 months, 18 months, 3 years, and 6 years. All patients received optional psychopharmacological consultations with a psychiatrist as part of the follow-up evaluations. The staff at the DPP conducted the initial clinical and diagnostic evaluations while PhD students and research assistants performed the follow-up interviews and diagnostic evaluations. Written informed consent was obtained from participants after they were provided with a description of the study. The Data Inspectorate and Regional Ethics Committee in Norway approved the project. Study design and recruitment of therapists have been described in more detail in previous publications [47].

2.2. Participants

The UPP comprised a total of 113 patients. Only patients with PDs were included in the trial, and exclusion criteria were schizotypal PD, antisocial PD, ongoing alcohol or drug dependence, psychotic disorders, bipolar I disorder, untreated ADHD (adult type), pervasive developmental disorder (e.g., Asperger's syndrome), organic syndromes, and homelessness. RF was measured only in a subsample of patients with a diagnosis of BPD and/or AvPD, comprising 79 patients in total. A total of 29 patients had a diagnosis of AvPD but not BPD, 16 patients had diagnoses of both AvPD and BPD, and 34 patients had a diagnosis of BPD and not AvPD. The average age at the time of inclusion was 30.6 years, and 81% of participants were female. Fifty percent of the participants had more than 12 years of education, and 41% had not worked or studied during the last year. Among those who had worked or studied in the last year, the average number of months doing so was 7.7. A total of 83% of the patients were diagnosed with a mood disorder at baseline; 85% had an anxiety disorder, and 33% had a substance disorder. After the randomization procedure, which left patients in one of the two treatment conditions, the two conditions did not differ significantly in socio-demographic or clinical variables [46]. In the 3-year follow-up study, one patient with an RF score was not included in the analyses because of an administrative failure. This patient was, however, included in later studies, the 6-year follow-up investigation, and the present study. The differences in patient numbers did not alter the results of the comparison of treatment conditions at baseline.

2.3. Completeness of data

Fig. 1 depicts the flow of patients throughout the study. Of the 79 patients, 55 (69%) patients attended the 6-year follow-up, which constituted 71% of the original patients in the step-down group and 68% of the original participants in the outpatient group. The difference in attendance rates between the two treatment conditions was not statistically significant. Compared to patients who participated in the 6-year follow-up investigation, those who did not attend had

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│ Assessed for eligibility (n = 250) │
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│     BPD or AvPD (n = 79)         │
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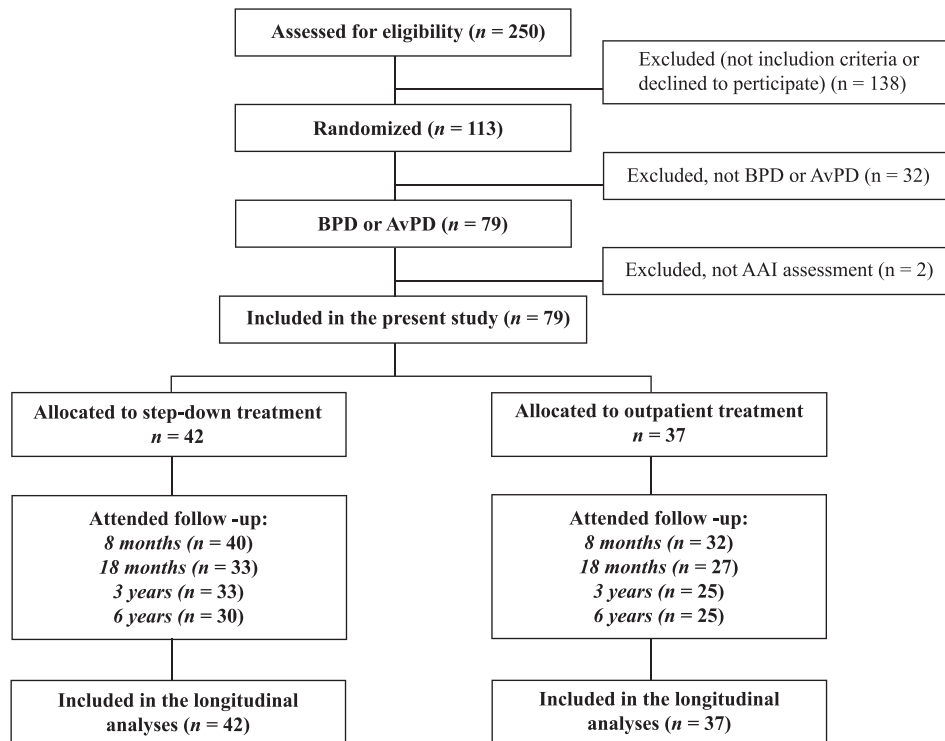

Fig. 1. Patient flow in a randomized clinical trial comparing a step-down treatment program with outpatient treatment.

higher Global Severity Index (GSI) levels at baseline [2.10 (SD = .56) versus 1.70 (SD = .63), p = .01] and more often had an eating disorder (24% versus 7%, p = .04). There were no other statistically significant clinical, diagnostic, or sociodemographic variables differentiating patients who did and did not attend the 6-year follow-up. The response rates for the other follow-up investigations were 91% at 8 months, 76% at 18 months, and 73% at 3 years.

2.4. Treatments

2.4.1. Step-down day hospital treatment (step-down treatment)

The step-down treatment condition started with an 18-week day-hospital treatment phase that included a combination of psychodynamic and cognitive–behavioral group therapies for 3 to 4 days per week. The written treatment guidelines adhered to relational psychotherapy, with references to psychodynamic group psychotherapy, self-psychology, and mentalization-based thinking. After this initial day-hospital treatment phase, the patients continued with outpatient combined psychotherapy, which included a combination of weekly 1.5-hour group therapy sessions (maximum of 4 years) and weekly individual therapy (maximum of 2.5 years). Group therapists were regular staff from the DPP (three psychiatric nurses, two psychiatrists, one residential doctor who specialized in psychiatry, one specialist in clinical psychology, one art therapist, one social worker, and one physiotherapist). Seven of the ten therapists had 5 years of training in group analysis. The mean age of the therapists was 48 years (SD = 9), and

80% were women. The individual therapists involved in the follow-up outpatient treatment comprised 16 psychologists, 12 psychiatrists, and two psychiatric nurses (n = 30). Seven were recruited from the regular staff at the DPP, the rest was mainly therapists in private practice. The therapists treated between one and three patients each. The mean age of the individual therapists was 50 years (SD = 9), and 57% were women. The mean work experience as psychotherapists was 16 years (SD = 8).

The average treatment duration for patients in the step-down treatment was 32 months (SD = 16), and the median was 30 months (range: 7–58). The average number of therapy sessions (including both individual and group) during the outpatient follow-up therapy was 107 (SD = 76), and the median was 108 (range: 1–290). The mean interval between the end of study therapy and the 6-year follow-up investigation (post-treatment phase) was 38 months (SD = 17), and the median was 40 months (range: 8–68).

2.4.2. Outpatient individual psychotherapy (outpatient treatment)

The outpatient treatment was mainly conducted by therapists in private practice. The therapists were instructed to treat the patients according to their own preferred method and practice. The researchers gave no instructions to the therapists regarding the duration and intensity of psychotherapy, nor did they interfere with any treatment decisions. Thirty-two external therapists were recruited as outpatient individual therapists (16 psychologists, 15 psychiatrists, and one resident). Each treated one to three patients. The mean age of the therapists was 55 years (SD = 8), and 41% were

women. The mean work experience as psychotherapists was 20 years (SD = 8).

The average treatment duration was 25 months (SD = 20), the median was 20 months (range: 1–72), and the average number of therapy sessions was 65 (SD = 60) with a median of 45 (range: 2–283). The mean interval between the end of study therapy and the 6-year follow-up investigation (post-treatment phase) was 46 months (SD = 19), with a median of 52 months (range: 0–72).

2.5. Assessments

2.5.1. AAI and RF

The AAI [48] was scored with the RF scale [5] to measure each participant's capacity for mentalization. In the AAI interview, participants were asked to describe their childhood attachment relationships and everyday routines (e.g., going-to-bed routines). They were also asked more specific questions about traumas and experiences of rejection, separation, and loss. Furthermore, the subjects were invited to reflect upon their caregivers' mental states and intentions (e.g., why they thought their parents behaved as they did during their childhood), and how they thought their childhood experiences with their parents affected their adult personalities. The RF scale evaluates people's capacity to think and reflect upon their own and others' mental states and the level of complexity of this reflection. The scale ranges from −1 (negative RF: a systematic resistance to the reflective stance) to 9 (exceptional RF: i.e., fresh, complex, and unusually sophisticated reflections with original elaborations).

Average RF values in the current sample were 3.0 (SD = 1.5) in the step-down treatment and 3.5 (SD = 1.7) in the outpatient treatment condition. The average intraclass correlation coefficient (ICC 2.1) for the overall RF scores was .73, after exclusion of one outlier, and .61 when this outlier was included [46]. The outlier was a patient who initially received an RF score of 5 and then of 0 in the reliability test. The two raters disagreed about the level of authenticity of the patient's capacity for mentalization. Although one of the two raters experienced the patient as genuinely mentalizing, the other rated the patient's mentalizing efforts as self-distorted and generally poorly integrated. Because of the intention-to-treat approach in this study, all patients were included in the statistical analyses.

In the present study, RF scores were dichotomized; RF scores below 3 were categorized as low (n = 26), and scores of 3 and above were categorized as medium (n = 52). The term 'medium RF' is used instead of high RF because high values in this patient group are believed to be relatively low compared to non-clinical samples. This dichotomization was based on an a priori decision. The rationale is both empirical [14] and based on the clinical impression of a clear difference between patients with almost no capacity for mentalization (i.e., below RF 3) and patients with mentalizing tendencies (i.e., RF 3 and above).

The ratings in this study were based on a thorough reading of verbatim transcripts made from audiotapes of AAIs by three different coders (all authors of the present study; MJ, FR and TW). The coders had attended the course "Reflective Functioning on the Adult Attachment Interview" at the Anna Freud Centre in London, and they successfully completed the Reliability Test related to this course. All three were authorized to utilize the Reflective Functioning Scale for clinical and research purposes and publish research data obtained with the scale.

2.5.2. Axis I and II diagnoses

Axis I diagnoses were based on the Mini International Neuropsychiatric Interview (known as the MINI) [49]. Axis II diagnoses were determined with the Structured Clinical Interview for DSM-IV (SCID-II) [50]. Two independent raters scored 24 videotaped SCID-II baseline interviews. The kappa value for three PDs represented by at least five cases was .75 for avoidant PD, .66 for borderline PD, and .71 for paranoid PD; these values indicated acceptable diagnostic reliability. The reliability (ICC 2.1) for total number of SCID-II criteria was .83.

2.5.3. Symptom distress

Self-reported symptom distress was measured with The Symptom Checklist (SCL-90-R) [51], which comprised 90 questions, each rated on a scale from 0 (not at all) to 4 (very much). The SCL-90-R was designed to cover the major symptoms of psychiatric distress. The scores were summarized with the GSI, which is the mean score of the 90 items.

2.5.4. Interpersonal problems

Self-reported interpersonal problems were measured with the Circumplex of Interpersonal Problems (CIP) [52]. The CIP is a 48-item Norwegian version of the Inventory of Interpersonal Problems-Circumplex version [53]. The CIP has a 5-point Likert response format that ranges from 0 (no distress) to 4 (extremely distressing). The sum score of the two versions correlates .99.

2.5.5. Psychosocial functioning

Psychosocial functioning was assessed with the Global Assessment of Functioning (GAF). The GAF is rated on a scale from 0 to 100, and a high score indicates a high level of functioning. The GAF scores were observer rated according to a split symptom and function version [54], and only the lower of the two scores was used in the analyses. The reliability (ICC 2.1) of the GAF scores in the whole sample was .56 at baseline, .81 at 8 months, .85 at 18 months, .94 at 3 years, and .92 at 6 years. The Work and Social Adjustment Scale (WSAS) is a self-reported 5-item scale of functional impairment that measures level of impairment on a scale from 0 to 8, where 0 indicates no impairment at all and 8 indicates very severe impairment. The scores on the five different items are totaled in a sum score (range: 0–40).

2.5.6. Self-esteem

Self-esteem was assessed using the Index of Self-esteem (ISE) [55,56], a 25-item self-evaluative questionnaire that measures the degree or severity of a subject's self-esteem

problems. The scale produces scores that range from 0 to 100, where a score of 0 indicates that the subject has none of the attributes and 100 represents the highest possible distress level. Respondents who score above 30 are assumed to have clinically significant self-esteem problems.

2.5.7. Personality functioning

(Mal)Adaptive personality functioning were measured using the 60-item short form of Severity Indices of Personality Problems (SIPP-118) questionnaire. The 60 items are directly assigned to five higher-order domains: Self-control, Identity Integration, Relational Capacities, Responsibility, and Social Concordance. Scores range from 1 to 4, with lower scores reflecting more maladaptive levels of personality functioning [57]. In the current study, only three out of the five domains were used: Self-control, Identity Integration, and Relational Capacity. The rationale for using only three domains was multiple. First, to reduce the total number of analyses, next, these three domains were regarded most clinically relevant, and lastly they have also shown the best construct validity in the full version of SIPP-118 (Verheul 2008).

2.6. Statistical analysis

All results were analyzed using an intention-to-treat approach based on treatment assignments. The baseline association between RF and clinical variables was assessed using an independent t-test (two-tailed). Linear mixed modeling (LMM) was used for all longitudinal analyses with maximum likelihood as the method of estimation. The parameters of interest were time × RF (predictor analyses) and time × RF × treatment (moderator analyses). Separate random intercepts and slopes were included when proven to enhance the model fit. Time was used as a linear interaction for all LMM analysis. Missing at random (MAR) was assumed when assessing the magnitude of selection bias from loss to follow-up. Although it is not possible to test the MAR assumption, a comparison with complete cases (participants with all follow-up assessments) is informative and was conducted in this study. Within-group pre-post effect sizes were computed using Cohen's *d*, with pooled pre- and post-SD adjustment for sample size. When interpreting the significance levels, it is important to keep in mind that no correction for multiple testing was conducted in this trial. All analyses were performed using SPSS (version 20; SPSS Inc.).

3. Results

3.1. Associations between RF and clinical variables at baseline

Table 1 shows the differences between patients with low and medium RF at baseline. Patients in the low RF group had significantly higher levels of GSI, CIP, and WSAS at baseline compared with the medium RF group. They also had significantly lower ISE and lower levels of the personality

Table 1
Independent t-test analyses between patients with low and medium RF at baseline.

	Low RF		Medium RF		
	Mean	(SD)	Mean	(SD)	p
GSI	2.08	(0.67)	1.7	(0.53)	0.012
CIP	1.97	(0.43)	1.62	(0.5)	0.004
GAF	46.3	(4.5)	47.2	(3.9)	0.383
WSAS	27.74	(6.4)	24.27	(7.22)	0.041
ISE	65.11	(11.11)	56.76	(10.72)	0.002
SIPP-118 domains					
Identity Integration	1.70	(0.52)	2.17	(0.61)	0.001
Relational Capacities	2.10	(0.59)	2.46	(0.64)	0.018
Self-control	2.63	(0.56)	2.64	(0.70)	0.955

GSI = Global Severity Index, CIP = Circumplex of interpersonal problems, GAF = Global Assessment of Functioning, WSAS = Work and Social Adjustment Scale, ISE = Self-esteem.

functioning domains Identity Integration and Relational Capacity. Patients with low and medium RF values did not differ significantly in the variables GAF and Self-control.

Furthermore, at baseline, there were no differences between patients with low and medium RF values in number of PD criteria or Axis I diagnoses. Concerning the baseline distribution of patients in the medium and low RF groups, for patients with AvPD with or without co-occurring BPD, the low RF group had a significantly larger proportion of patients (p = .04). For patients with BPD, with or without AvPD, however, there was a non-significant trend towards a larger proportion of patients in the medium RF group (p = .086).

3.2. RF as a predictor of clinical outcome

LMM analyses of RF × time, indicating whether RF predicted improvement across treatments over time, showed no significant effects on any of the outcome variables (GSI, p = .85; CIP, p = .93; GAF, p = .16; WSAS, p = .56; ISE, p = .80; Identity Integration, p = .95; Relational Capacity, p = .99; Self-control, p = .78). Adjustments were done for the potential confounding effects from age and gender at baseline.

3.3. RF as a moderator of treatment effect

Tables 2 and 3 show the LMM estimates from the three-way moderator analyses (time × treatment × RF) for the clinical variables and personality functioning, respectively. RF was a significant moderator of treatment effects for GSI, CIP, GAF, Identity Integration, Relational Capacities, and Self-control but not for the outcome variables ISE and WSAS. The direction of the interaction effects of RF on treatment condition is shown as effect sizes in Table 4 and as graphs in Fig. 2.

Patients in the medium RF group in the step-down treatment had greater effect sizes on all outcome variables when compared to patients with medium RF in the outpatient treatment (Table 4). Average effect sizes for patients with medium RF in the step-down treatment were 2.24 while average effect sizes for patients with medium RF in the outpatient treatment condition were 1.0. Between-treatment

Table 2
Reflective functioning (RF) as a moderator of treatment effects on clinical outcome.

Dependent variable and parameter	Estimate	df	t	p	95% Confidence interval	
					Lower bound	Upper bound
GSI dependent variable						
Intercept	1.78	88.28	8.91	0.000	1.38	2.17
Time	−0.01	69.79	−2.83	0.006	−0.02	0.00
RF	−0.32	87.15	−1.37	0.174	−0.79	0.15
Treatment	0.08	86.07	0.32	0.747	−0.43	0.60
Time × RF	0.01	66.09	1.43	0.156	0.00	0.01
Time × treatment	0.00	65.50	0.77	0.442	−0.01	0.01
RF × treatment	0.06	85.12	0.18	0.860	−0.57	0.68
Time × treatment × RF	−0.01	62.67	−2.26	0.027	−0.02	0.00
CIP dependent variable						
Intercept	1.75	79.42	11.67	0.000	1.45	2.05
Time	−0.01	69.40	−3.24	0.002	−0.02	0.00
RF	0.22	78.68	1.13	0.261	−0.17	0.61
Treatment	−0.21	79.02	−1.17	0.246	−0.56	0.15
Time × RF	0.01	65.83	1.48	0.144	0.00	0.01
Time × treatment	0.01	65.88	1.73	0.088	0.00	0.01
RF × treatment	−0.14	78.31	−0.60	0.550	−0.61	0.33
Time × treatment × RF	−0.01	63.23	−2.27	0.027	−0.02	0.00
GAF dependent variable						
Intercept	46.5	70.62	36.71	0.000	43.9	49.0
Time	0.32	44.47	4.37	0.000	0.17	0.47
RF	−0.36	70.73	−0.22	0.828	−3.69	2.96
Treatment	1.20	70.69	0.79	0.430	−1.81	4.21
Time × RF	−0.20	39.97	−2.09	0.043	−0.39	−0.01
Time × treatment	−0.07	42.36	−0.80	0.428	−0.24	0.10
RF × treatment	−0.01	70.80	0.00	0.996	−4.05	4.03
Time × treatment × RF	0.26	39.25	2.27	0.029	0.03	0.48
WSAS dependent variable						
Intercept	23.7	70.94	9.86	0.000	18.9	28.4
Time	−0.12	63.67	−1.84	0.071	−0.24	0.01
RF	2.59	70.36	0.83	0.410	−3.64	8.83
Treatment	−3.12	70.72	−1.10	0.276	−8.80	2.55
Time × RF	0.01	59.02	0.14	0.889	−0.15	0.17
Time × treatment	0.01	58.96	0.11	0.912	−0.14	0.15
RF × treatment	−0.69	70.44	−0.18	0.856	−8.25	6.87
Time × treatment × RF	−0.07	55.75	−0.73	0.471	−0.26	0.12
ISE dependent variable						
Intercept	58.4	72.13	15.73	0.000	51.0	65.8
Time	−0.16	62.30	−2.17	0.034	−0.32	−0.01
RF	8.67	71.64	1.79	0.078	−1.00	18.35
Treatment	−3.93	72.19	−0.89	0.376	−12.72	4.86
Time × RF	0.04	58.73	0.37	0.709	−0.15	0.23
Time × treatment	0.05	58.81	0.60	0.551	−0.12	0.23
RF × treatment	−9.33	71.78	−1.58	0.118	−21.06	2.41
Time × treatment x RF	−0.12	56.18	−1.10	0.277	−0.35	0.10

comparison of LMM estimated values for all 6-year outcome variables showed medium to high effect sizes in favor of the step-down treatment condition.

In contrast, patients with low RF in the outpatient treatment had greater effect sizes than patients with low RF in the step-down treatment condition on all outcome variables except self-esteem. The average effect size for patients with a low RF was 1.81 in the outpatient treatment and 1.22 in the step-down treatment condition. Between-treatment comparison of LMM estimated values after 6 years showed medium to high effect

sizes in favor of the outpatient treatment (except for self-esteem) for patients with low RF at baseline.

3.4. Attrition bias

All results showing statistically significant moderator effects of RF in the intention-to-treat analyses also showed a p value close to the alpha level of .05 in the complete case analyses: GSI, p = .06; CIP, p = .09; GAF, p = .06; SIPP-118; Identity Integration, p = .08; Relational Capacity, p = .05; Self-control,

Table 3
Reflective functioning (RF) as a moderator of treatment effects on personality functioning.

Dependent variable and parameter	Estimate	df	t	p	95% Confidence interval	
					Lower bound	Upper bound
Self-control dependent variable						
Intercept	2.59	84.99	23.64	0.000	2.37	2.80
Time	0.01	54.82	7.22	0.000	0.01	0.01
RF	−0.08	85.92	−0.42	0.674	−0.44	0.29
Treatment	0.01	86.73	0.08	0.933	−0.30	0.33
Time × RF	−0.01	56.12	−2.26	0.028	−0.01	0.00
Time × treatment	−0.01	55.23	−3.44	0.001	−0.01	0.00
RF × treatment	0.08	88.90	0.28	0.781	−0.48	0.63
Time × treatment × RF	0.01	61.40	2.77	0.007	0.00	0.02
Identity dependent variable						
Intercept	2.35	77.67	20.02	0.000	2.11	2.58
Time	0.02	52.68	7.03	0.000	0.01	0.02
RF	−0.51	77.19	−2.59	0.011	−0.90	−0.12
Treatment	−0.02	78.21	−0.14	0.892	−0.36	0.31
Time × RF	−0.01	53.33	−1.58	0.120	−0.01	0.00
Time × treatment	−0.01	51.74	−2.66	0.011	−0.01	0.00
RF × treatment	0.17	78.12	0.58	0.567	−0.42	0.76
Time × treatment × RF	0.01	56.56	2.08	0.042	0.00	0.02
Relation dependent variable						
Intercept	2.63	89.56	21.90	0.000	2.39	2.87
Time	0.01	90.70	6.05	0.000	0.01	0.01
RF	−0.48	90.10	−2.39	0.019	−0.88	−0.08
Treatment	−0.01	90.72	−0.08	0.934	−0.36	0.33
Time × RF	0.00	90.57	−1.31	0.194	−0.01	0.00
Time × treatment	0.00	88.32	−1.40	0.164	−0.01	0.00
RF × treatment	0.07	92.26	0.21	0.831	−0.54	0.67
Time × treatment × RF	0.01	97.21	2.12	0.036	0.00	0.02

Table 4
Pre-post treatment effect sizes for patients with low and medium RF in step-down and outpatient treatment conditions. Calculations are based on LMM estimates, and the between treatment effect sizes are based on the 6 year estimates.

|	Outcome measure	Step-down					Outpatient					Between treatment comparison	
		Baseline		6 years		Pre-post effect size	Baseline		6 years		Pre-post effect size	Between group effect size	Treatment with largest effect size
		mean	SD	mean	SD		mean	SD	mean	SD			
Low RF	GSI	1.86	0.53	1.39	0.57	**0.86**	1.78	0.50	1.06	0.54	**1.38**	**0.58**	Outpatient
	CIP	1.97	0.36	1.63	1.98	**0.82**	1.75	0.32	0.97	0.43	**2.07**	**0.43**	Outpatient
	GAF	46.1	2.7	55.1	4.5	**2.44**	46.5	3.7	69.6	7.2	**4.03**	**2.52**	Outpatient
	WSAS	26.3	5.3	18.6	7.0	**1.23**	23.7	5.4	15.2	7.4	**1.30**	**0.47**	Outpatient
	ISE	67.0	7.7	57.7	9.5	**1.08**	58.4	10.1	46.5	14.4	**0.96**	**0.95**	Step-down
	Self-control	2.51	0.41	2.87	0.44	**0.85**	2.60	0.41	3.23	0.51	**1.38**	**0.77**	Outpatient
	Identity	1.83	0.41	2.52	0.52	**1.47**	1.97	0.47	2.94	0.58	**1.84**	**0.78**	Outpatient
	Relation	2.15	0.43	2.57	0.44	**0.97**	2.20	0.53	3.03	0.58	**1.48**	**0.9**	Outpatient
High RF	GSI	1.59	0.45	0.70	0.48	**1.92**	1.45	0.57	1.15	0.62	**0.51**	**0.8**	Step-down
	CIP	1.62	0.36	0.95	0.47	**1.60**	1.54	0.41	1.23	0.55	**0.63**	**0.55**	Step-down
	GAF	47.3	2.9	69.7	6.3	**4.59**	47.7	3.0	65.8	7.5	**3.16**	**0.57**	Step-down
	WSAS	22.4	5.2	10.5	6.8	**1.98**	20.5	6.3	12.7	8.5	**1.05**	**0.29**	Step-down
	ISE	53.8	8.8	39.4	11.2	**1.43**	54.4	11.3	46.3	15.4	**0.60**	**0.52**	Step-down
	Self-control	2.56	0.37	3.33	0.41	**1.96**	2.59	0.55	2.84	0.59	**0.44**	**0.95**	Step-down
	Identity	2.30	0.34	3.42	0.38	**3.11**	2.31	0.56	2.83	0.63	**0.87**	**1.13**	Step-down
	Relation	2.59	0.48	3.28	0.54	**1.36**	2.62	0.53	3.06	0.61	**0.77**	**0.38**	Step-down
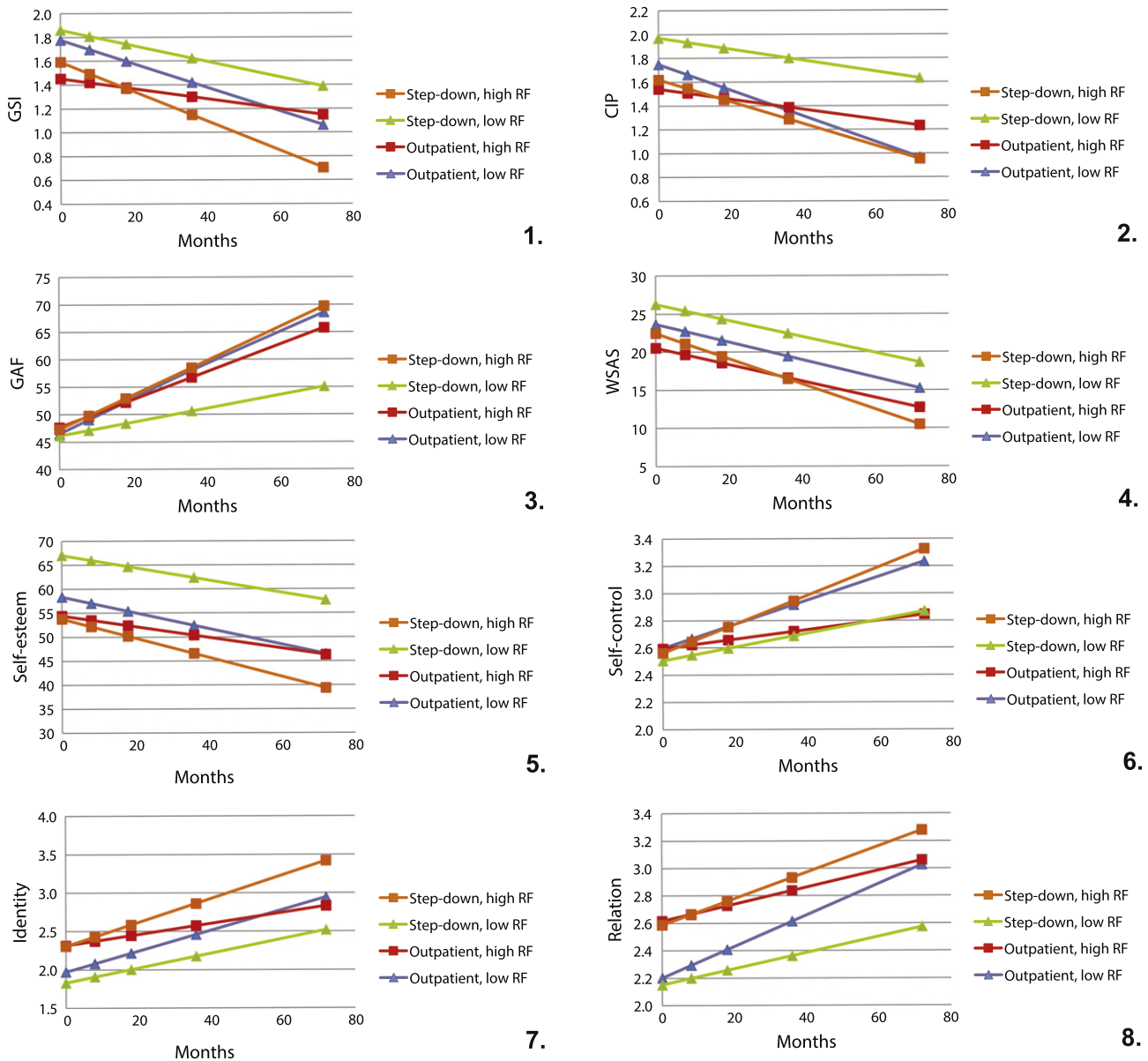
Fig. 2. Course of outcome variables for patients with low and medium RF in the step-down and outpatient treatment conditions, estimates from the LMM analyses.(1) Global Severity Index, (2) Circumplex of interpersonal problems, (3) Global Assessment of Functioning, (4) Work and Social Adjustment Scale, (5) Self-esteem, (6) Self-control, (7) Identity Integration, (8) Relation Capacity.

p = .02. As in the intention-to-treat analysis, patients with medium RF achieved better clinical outcome in the step-down treatment condition while patients with a low RF attained better results when in the outpatient treatment condition. A total of 43 patients contributed to the complete case analysis: 25 in the step-down program and 18 in the outpatient treatment. Of these were 12 patients in the low RF group, and 31 patients in the medium RF group.

4. Discussion

First, the present study shows an association between RF and a wide range of clinical variables in a sample of patients with BPD and/or AvPD. Before entering study treatment, patients in the low RF group reported higher levels of symptomatic and interpersonal distress, more self-esteem problems, lower psychosocial functioning, and lower levels of personality functioning regarding identity and relational functioning.

The associations between RF and intensity of symptom distress and psychosocial impairment indicate that the mentalization construct captures clinically relevant phenomena. The cross-sectional and correlational nature of our findings limits conclusions regarding the direction of these associations and thereby causality. However, Chiesa and Fonagy [19] found that RF was a significant mediator between childhood adversity and symptom distress, supporting that

mentalizing abilities to some degree may protect against the development of severe symptoms in patients with PD.

Moreover, we found statistically significant associations between RF and the SIPP-118 personality functioning domains Identity Integration and Relational Capacity, as well as self-esteem and interpersonal problems, implying that RF is indeed related to personality pathology in terms of disturbances in self and self in relation to others. These findings are in line with Fonagy et al.'s idea of mentalization deficits as a core aspect of PDs [2,17]. A relation between personality functioning and RF is also in accordance with the findings of Fischer-Kern et al. [22], who reported in a sample of BPD patients a significant association between RF and personality organization. They performed their assessment using the STIPO, which covers several domains of personality functioning including identity consolidation and quality of object relations. In addition, Müller et al. [44] found a significant correlation between RF and personality organization in a sample of patients with depression or eating disorders. In that study, personality organization was assessed by the structure axis (axis IV) of the operation psychodynamic diagnostics (OPD) [58,59], based on an OPD interview. Like the STIPO methodology, the structure axis of OPD aims to cover a broad set of personality domains such as self and object recognition, regulation, communication, and attachment [58]. In a recent report by Doering et al. [60], axis IV of the OPD was used as a measure of the level of personality functioning, and PD patients showed significantly worse results on axis IV outcomes than patients without PD.

Although the present study shows a broad association between RF and clinical variables we found no difference between groups with low and medium RF in the Self-control domain of SIPP-118. This was somewhat surprising since the Self-control domain is meant to capture the characteristic BPD problems of emotional hyperarousal and impulsivity, the same BPD features that mentalizing capacity is thought to buffer against. [14] One reason for the lack of an association between Self-control and RF could be that RF measured by AAI primarily captures mentalizing abilities related to early attachment relationships, and is neither a score of patients' general mentalization abilities nor a score that captures other specific deficits in mentalization [3,61]. This concern is also raised by Fonagy and Luyten [18], who state that patients' mentalizing capacity is likely to be altered in states of emotional arousal and that the AAI interview may not capture more fluctuating mentalizing deficits in current situations and relationships. Thus, it could be that future research should address the question of more domain- or context specific versions of RF. Symptom-specific RF versions already exist for panic disorder [62] and obsessive–compulsive disorder [63], and these studies indicate that a patient's symptom-specific RF is lower than a patient's RF as assessed by the AAI interview. On the other hand, moving to more symptom- or context specific measures of RF may reduce it's value as a trans-diagnostic construct. It risk's

becoming a more circumscribed construct and could thus lose its ability to be compared across samples and studies. Whether it is possible to balance or combine such different perspectives in future developments of assessment of mentalizing abilities should be a topic for further discussion and research.

In the present sample there were a greater proportion of patients with AvPD than BPD in the low RF group. This finding indicates that mentalizing problems are not limited to BPD but may be a feature of other types of personality pathology as well. Whether AvPD is associated with even more mentalizing difficulties than BPD is not clear. Mentalizing deficits in patients with AvPD could reflect a more general limited access to mental states and poor emotional awareness [25,64], rather than context dependent hyperarousal and impulsivity typical of BPD. Thus, related to the discussion above, there is a possibility that AAI based RF is not equally able to capture the particular mentalizing problems in different PDs.

The second aim of this study was to investigate whether RF is associated with long-term clinical course. In line with the findings at 3-year follow-up [46], in the current study we did not identify RF as a significant predictor of 6-year outcome. Correspondingly, Taubner et al. [10] found that the level of RF did not predict outcome in terms of change in symptoms during long-term psychoanalytic treatment for patients with chronic depression. On the other hand, Müller et al. [44], investigating patients with depression or eating disorders who received 3 months of inpatient treatment, found that pretreatment RF level was significantly correlated with improvement in overall mental condition. These studies are difficult to compare with the current study and with each other because of differences in diagnoses, treatments and duration of the follow-up investigations. Clearly, more studies are needed to determine the long-term impact of pre-treatment mentalization capacity.

An important finding in the present study is that when taking type of treatment into account, we found significant moderator effects of RF. Patients with low RF had better outcomes in the outpatient treatment condition compared to the step-down program. This finding concurs with the results from the 3-year follow-up [46]. The current results also extend the findings of Gullestad et al. [46] by detecting differences in symptomatic distress, interpersonal problems, and personality functioning in addition to psychosocial functioning. Moreover, a novel finding in this 6-year follow-up was that the patients in the medium RF group achieved better results in the step-down program than in the outpatient treatment. Effect sizes estimated for comparison of 6-year outcomes in the two treatment conditions were in the large range for six of the eight outcome variables, indicating strong clinical significance.

Although several factors may have caused the moderator effects, one of the most obvious structural differences between the treatment conditions was the use of group psychotherapy in the step-down treatment. A possible

explanation of the weaker result for patients with low RF in the step-down treatment may therefore be that the group psychotherapy was too demanding for patients with a low capacity for understanding themselves and others. This may also be the explanation why patients with low RF in fact achieved greater results in the outpatient treatment than in the step-down program. On the other hand, the group therapy format might not have been as influential as the type of group therapy offered in the present project. The group therapists in the step-down treatment were trained in group analytic therapy, a therapeutic style and approach that could be suitable for patients with some capacity for making sense of their own and others' mental states but that may be too unstructured for patients with low or absent mentalizing capacity. In a study by Kvarstein et al. [65], clinical outcomes for BPD patients in a psychodynamically oriented treatment program resembling UPP's step-down treatment were compared with a mentalization-based treatment program (MBT) in which group psychotherapy was specifically structured. The results were clearly in favor of the latter. That study did not, however, include measures of mentalization capacity. An interesting issue for further research is to what extent the more structured MBT group therapy is beneficial for patients low in RF.

In contrast to patients with low RF, patients in the medium RF group improved more on several clinical variables when treated in the step-down program as compared to the outpatient treatment. How can we understand this finding? We may hypothesize that patients with an RF level of at least 3 would presumably have a greater capacity to engage in a therapeutic project involving perception of and reflection on mental states and interpersonal issues. The complex group setting might then not be overwhelming, and important therapeutic factors such as therapeutic alliance and group cohesion [66] may evolve. If the patient feels reasonably secure, the group may provide an arena for social exposure and interpersonal learning. The group format may thus challenge and stimulate mentalization more than individual therapy alone. In our study, patients with medium levels of RF may have been more capable of learning from their own emotional experiences in interactions with group members and how their own behavior could impact others' feelings. Moreover, when combined with individual therapy, as was the case in the step-down condition, the patients can receive guidance about understanding the group interactions and further reflect on how the individual patients understand both themselves and the other group members.

It is important to keep in mind that UPP is a study of treatment formats rather than of specific psychotherapeutic orientations and techniques. The treatments were not manualized, and there was no registration of treatment processes. Thus, interpretations of the moderator effects are highly speculative. However, the results suggest that the long-term outcome of intensive combined treatment may be favorable for patients with a minimum of mentalizing capacity. Patients with low RF, however, may benefit from

the less intensive and more flexible outpatient individual therapy format, which gives the therapist a better opportunity to monitor and adjust to a patient's ongoing or fluctuating levels of mentalizing.

In contrast to most other studies on RF, we dichotomized the RF scores into categories of low and medium RF, and like Fonagy et al. [14], we set a cutoff at RF 3. Transcripts rated below 3 on the RF scale will be characterized by very restricted to complete absence of RF, e.g., the subjects give concrete explanations and refer to physical or sociological, rather than psychological, reasons for human behaviors. On the other hand, in transcripts rated RF 3 or above, subjects are usually capable of referring to mental state explanations, although some may be rudimentary or cliché. Hence, our study differentiates between patients with or without mentalizing capacity and was not designed to reveal finer potential differences between patients with, for example, medium and high mentalizing capacity.

The strengths of the present study include its randomized design and the long-term follow-up of long-term therapies with a wide range of clinical outcomes. Additionally, the two treatments were conducted in ordinary clinical settings, and few severe cases with complicated comorbidity were excluded, thus strengthening the study's external validity. The study includes patients with BPD and AvPD, which are the two most commonly occurring PDs in clinical settings, making the sample clinically relevant. However, investigation of possible differences in RF associated with PD diagnoses, although a highly relevant research issue, was not within the scope of the present study and would also be limited because of the sample size. The present study did not control for patients intelligence or other cognitive measures potentially influencing treatment outcome. Another limitation of this study was the relatively low number of participants, making it prone to type II errors. Also, although the response rate was acceptable, missing data and violation of MAR assumptions could bias the results. On the other hand, the complete case analyses support the validity of the present findings.

In the outpatient treatment condition, the therapists treated patients according to their own preferred method and practice. Although this approach strengthened the ecological validity of the study, the results could potentially have been different if patients had received individual psychotherapeutic treatment in accordance with more established specialized PD treatment. Lastly, another limitation is that we did not take into account treatments the patients may have received during the 6-year follow-up period.

5. Conclusions

The findings in this study indicate that RF is associated with core aspects of personality pathology and captures clinically relevant phenomena in adult patients with PDs. Moreover, patients with different capacities for reflection

may need different kinds of therapeutic approaches. The present findings point towards several important issues for future research. The clinical manifestations of varying levels of RF suggest that mentalization may be an important target in psychotherapies for patients with PDs. We need more knowledge regarding to what degree mentalizing abilities may develop as a result of treatment and how different psychotherapies may contribute to improvement in RF. Future studies should also investigate the clinical implications of such changes. Measuring RF on the basis of AAI is a time-consuming method, and to stimulate research on these topics, further methodological developments in RF assessments should be encouraged.

Acknowledgment

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