



Panic-Focused Reflective Functioning and Comorbid Borderline Traits as Predictors of Change in Quality of Object Relations in Panic Disorder Treatments

Nili Solomonov^{1,2} · Katie Aafjes van-Doorn³ · Lauren M. Lipner⁴ · Bernard S. Gorman⁴ · Barbara Milrod¹ · Marie G. Rudden¹ · Dianne L. Chambless⁵ · Jacques P. Barber⁴

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Abstract

The aim of this study was to investigate whether (a) baseline levels of panic-specific reflection function (PSRF; i.e. patients' capacity to reflect on their panic symptoms) and improvement in this capacity over treatment, (b) baseline borderline personality disorder (BPD) traits and pre–post treatment improvement in BPD traits predict change in patients' quality of object relations (QORs). A subsample of 102 patients diagnosed with panic disorder from a larger randomized controlled trial received either Cognitive-Behavioral Therapy or Panic-Focused Psychodynamic Psychotherapy. We investigated whether baseline levels and change in both PSRF and BPD traits (as measured by the Structured Clinical Interview for DSM-IV Axis II) predicted pre–post change in QORs, while controlling for pre–post treatment change in panic symptoms assessed by the Panic Disorder Severity Scale. In both treatments, higher baseline levels of PSRF and lower levels of BPD traits, as well as pre–post decrease in BPD traits, predicted improvement in QOR when controlling for symptomatic change. The findings suggest that reduction in comorbid BPD traits can facilitate improvement in patients' QORs even in brief symptom-focused psychotherapies. Additionally, patients with higher baseline levels of symptom-focused reflective function and lower BPD traits are more likely to demonstrate interpersonal change over the course of psychotherapy for panic disorder. Finally, our study highlights the importance of examining therapeutic change beyond reduction in symptoms, particularly in domains of interpersonal functioning.

Keywords Mentalization · Quality of object relations · Panic disorder · Borderline personality traits · Process-outcome research

Reflective Function as a Self-Regulation Capacity

Reflective functioning (RF), an operationalization of mentalization, is defined as the capacity to understand and interpret one's own and others' behaviors as an expression of mental states such as feelings, thoughts, fantasies, beliefs, and desires (Allen et al. 2008; Bateman and Fonagy 2012; Fonagy et al. 1991). From an attachment perspective, one develops normal RF capacity within the context of secure formative attachment relationships, and the capacity to reflect is considered crucial to the development of healthy and adaptive interpersonal relationships (e.g., Bouchard et al. 2008; Fonagy and Target 1997; Jurist and Meehan 2008; Meins et al. 1998). The construct of RF is inextricably intertwined with other self-regulatory emotional capacities, such as affect regulation, impulse control, the capacity to

✉ Nili Solomonov
nis2051@med.cornell.edu

¹ Department of Psychiatry, Weill Cornell Medical College, New York, USA

² Weill Cornell Institute of Geriatric Psychiatry, Weill Cornell Medical College, White Plains, NY, USA

³ Ferkauf Graduate School of Psychology, Yeshiva University, New York, USA

⁴ The Gordon F. Derner School of Psychology, Adelphi University, Garden City, USA

⁵ Department of Psychology, University of Pennsylvania, Philadelphia, USA

manage stressful events, and self-monitoring (Fonagy et al. 2002).

Research on the role of RF in psychotherapy is fairly new and studies that assessed change in RF throughout treatment have varied in quality and produced mixed findings (see Katznelson 2014 for review), with a large variance in the operationalization and measurement of RF across studies. In efforts to develop a more specific and change-sensitive measure of RF, Rudden et al. (2006) developed the Symptom Specific Reflective Function (SSRF) measure to specifically capture capacity to reflect (i.e., mentalize) on symptoms. While RF is measured by assessing one's capacity to reflect on the self and the minds of others in interpersonal relationships, SSRF refers to the ability to reflect on the psychological underpinnings and emotional meaning of symptoms (Rudden et al. 2009). In the case of panic-disorder, panic-focused reflective function (PSRF) refers to patients' ability to identify underlying interpersonal-emotional conflicts that contribute to their panic symptoms. Indeed, a small pilot study showed that PSRF improved significantly with Panic-focused Psychodynamic therapy (PFPP) and decreased after Applied Relaxation Therapy (Rudden et al. 2006). Barber et al. (2019) investigated the role of PSRF as a predictor of change in panic symptoms in the sample examined in the current study. They found that higher levels of early change in PSRF predicted subsequent improvement in panic symptoms in both Cognitive Behavioral Therapy (CBT) and Panic-Focused Psychodynamic Psychotherapy (PFPP) for panic disorder. Thus, we decided to focus on PSRF (rather than general RF) as a predictor of change in quality of object relations (QORs) in our sample. No study to date has investigated the role of SSRF as a predictor of interpersonal change. This study aims to investigate whether patients' baseline PSRF as well as improvement in PSRF over the course of treatment will predict subsequent change in QORs.

Borderline Personality Traits and Reflective Function

RF has been studied in the context of several psychiatric disorders, in which patients' life-long interpersonal difficulties are posited to be potentially related to psychological symptoms (e.g., depression; Ekeblad et al. 2016; Fischer-Kern et al. 2008; Taubner et al. 2011; panic disorder; Rudden et al. 2006; Barber et al. 2019). Previous studies have demonstrated that patients with borderline personality disorder (BPD) traits or diagnosis tend to have significantly lower reflective function capacities and less adaptive interpersonal relationships (Bateman and Fonagy 2013; Fischer-Kern et al. 2010; Fonagy et al. 1996, 1998, 2002; Fonagy and Target 2000; Levy et al. 2006). Features characteristic of BPD, such as emotional dysregulation,

impulsivity, and low interpersonal functioning are hypothesized to emerge as a result of unstable mentalizing abilities (Fonagy et al. 2015). Patients with BPD are characterized by an affect-fueled switch to automatic mentalizing based on the exterior features of the other (i.e. facial features; Lowyck et al. 2016). Petersen et al. (2016) found that while BPD patients were capable of basic mentalizing tasks, they struggled with more complex tasks that required integration of multiple perspectives. Sharp and Vanwoerden (2015) suggested that patients with BPD hypermentalize, or in other words, are more likely to over-attribute extreme mental states to others, leading to the emotional outbursts commonly associated with this population. These failures in perceiving and interpreting behavior based on underlying mental states are presumed to result in difficulties understanding and interpreting interpersonal experiences (Lazarus et al. 2014). Thus, mentalization skills have been thought of as a critical point of intervention in the treatment of BPD, and have led to the development of mentalization-based therapy approaches, which use RF as an outcome variable for patients presenting with BPD, given the significant relationship found between the two constructs (Bateman and Fonagy 2016; Levy et al. 2006).

Panic Disorder, Comorbid Borderline Personality Traits, and PSRF

Borderline Personality traits or features are highly prevalent among individuals with primary Axis I and II diagnoses (Grant et al. 2008; Skodol et al. 2002; Zimmerman and Mattia 1999), with a recent large-scale study (N = 34,481) showing that 85% of individuals with BPD also had a lifetime anxiety disorder, and 25% of individuals with primary panic disorder also suffered from BPD (Tomko et al. 2014). In a recent study conducted in the present sample, Keefe et al. (2018) found that reductions in comorbid personality disorder traits [diagnosed with Structured Clinical Interview for DSM-IV Axis II (SCID-II)] were related to panic symptom reduction on Panic Disorder Severity Scale (PDSS; Shear et al. 1997). Their findings highlighted the importance of studying patients' personality comorbidity as a potential predictor of therapeutic outcome in treatments for patients with panic disorder. This study will expand on these findings by specifically investigating the role of comorbid BPD traits, as measured by the SCID-II as a potential predictor of change in interpersonal functioning in this sample.

Quality of Object Relations as a Therapeutic Outcome

Object relations has been the focus of psychodynamic theorists for over a century and can be traced back to works of Freud et al. (Ogden 1983), as well as Bowlby (1969) and

Kernberg (1980). Broadly, it refers to one's representations of oneself and others, which are formed in early formative attachment relationships. The quality of one's object relations plays an important role in the development of personality structure and the capacity to form and maintain adaptive interpersonal relationships, and can be viewed as an important outcome of psychotherapy (e.g. Høglend et al. 2006, 2008; Jacobson 1964; Moras and Strupp 1982). Despite the rich theoretical and clinical importance of QORs, empirical research investigating its role in psychotherapies is extremely limited, especially within evidence-based psychotherapies (Piper and Duncan 1999). Moreover, the abundance of theoretical work on object relations and the richness and complexity of object relations theories pose a significant challenge in the operationalization of this construct. In this study, we followed previous work by Piper, Azim, and colleagues (Azim et al. 1991; Piper and Duncan 1999; Piper et al. 1993) and investigated patients' object relations within life-long relationships, romantic relationships, and friendships (Azim et al. 1991; Piper et al. 1993). The focus is on the quality of external relationships, based on the assumption that the quality of interpersonal relationships reflects one's internal representations of others. High QORs is characterized by mature and stable relationships, with mutual love, care, and concern. In contrast, low QORs is characterized with unstable, conflictual, emotionally dysregulated and destructive relationships (Piper et al. 2004).

QORs is an especially relevant outcome for patients suffering from panic disorder and agoraphobia, as they experience high levels of interpersonal distress (Carter et al. 1994; Goldstein and Chambless 1978; Kleiner and Marshall 1985). Additionally, identifying predictors of improvement in QORs is important given previous work suggesting that panic disorder arises during times of elevated interpersonal life stress (Nay et al. 2013; Scocco et al. 2007), including interpersonal loss (Milrod et al. 2004), interpersonal conflict (Milrod et al. 1997), and severe and prolonged social isolation (Goldstein and Chambless 1978; Kleiner and Marshall 1985).

Existing literature suggests interpersonal dysfunction in general, and low QORs specifically, is highly prevalent among patients with BPD traits (see Lazarus et al. 2014 for review). We aimed to investigate the association between patients' comorbid borderline personality traits at baseline, as well as change in BPD traits over the course of treatment and improvement in QORs. To the best of our knowledge, this study is the first to empirically investigate this association. Investigating the role of change in object relations as a therapeutic outcome is important since the majority of psychotherapies for patients suffering from Axis I disorders and comorbid borderline traits include a primary focus on patients' interpersonal difficulties and maladaptive relationships (Bateman and Fonagy 2012; Linehan 2018).

Additionally, there has been increasing attention to the crucial role of patients' capacity to mentalize (especially those with borderline traits) (Bateman and Fonagy 2012). While these assumptions are translated into clinical practice and affect therapists' choice of interventions, there are only few empirical studies examining this topic.

In summary, this study aims to contribute to the sparse literature on the role of PSRF and BPD traits in change in object relations in psychotherapies for panic disorder. It includes two empirically supported treatments for panic disorder: CBT and PFPP, which take different approaches in addressing patients' comorbid interpersonal difficulties. PFPP aims to identify the unconscious conflicts leading to symptoms and to decode the personalized emotional meanings of the patient's symptoms (Busch et al. 2012). These conflicts often emerge in the context of patients' difficulties in interpersonal relationships, such as ambivalence regarding separation and autonomy or difficulty tolerating anger and aggression. Ultimately, improvement in the capacity to reflect on the underpinnings of one's symptoms (i.e., improvement in PSRF) could lead not only to symptom improvement but also to improvements in interpersonal functioning (Busch et al. 2012). In contrast, CBT directly addresses the cognitive distortions and problematic behaviors associated with anxiety, while also aiming to introduce skills that allow patients to begin to address some of the associated issues anxiety brings about, such as interpersonal problems. Interpersonal problems per se, however, are not a primary focus of CBT for panic disorder ± agoraphobia. The CBT framework takes a much more didactic approach than dynamic treatment, using techniques such as psychoeducation, cognitive re-framing, and exposure, including interoceptive exposure and in vivo exposure. In the process, CBT aims to impart patients with a new and improved knowledge of skills to be implemented in the face of panic symptoms including interpersonal problems (e.g., avoidance of social interactions), thus allowing for improved functioning (Zinbarg et al. 2006).

In line with previous literature and preliminary empirical findings we hypothesized that improvement in QORs in both treatments would be predicted by: (a) higher pretreatment levels of PSRF, (b) pre–post treatment improvement in PSRF, (c) lower baseline levels of comorbid SCID-II BPD traits, (d) pre–post improvement (i.e., reduction) in BPD traits.

Method

Participants

A subsample of 102 patients with primary DSM-IV panic disorder with or without agoraphobia from a large

randomized controlled trial (Milrod et al. 2016) were included in the current analyses. All patients completed the full treatment, with exception of one patient who completed 15 (out of 24) sessions. The 102 patients were randomized to either CBT ($n=53$) or PFPP ($n=49$) at two sites (Weill Cornell Medical College and the University of Pennsylvania, School of Medicine). All patients provided written informed consent. Patients were aged 18–70 and were all diagnosed with primary DSM-IV panic disorder with or without agoraphobia on the Anxiety Disorders Interview Schedule for DSM-IV Lifetime Version (ADIS-IV; DiNardo et al. 1994). Our sample was 68% female. The mean age was 39.84 ($SD=12.80$). The majority (74%) of patients self-identified as Caucasian/White ($n=75$), 17% African American/Black ($n=17$), 6% Asian ($n=6$), 1% Native American ($n=1$), and 3% “Other” ($n=3$). Eighty one percent of patients were diagnosed with Panic disorder with agoraphobia; 34% had comorbid depressive disorder.

Treatments

Cognitive Behavioral Therapy (CBT; Craske et al. 2000)

CBT was based on the Panic Control therapy (PCT) protocol, modified to fit a 24-session/45 min twice-weekly format. The treatment included the following active components: psychoeducation about anxiety and panic; identification and alteration of maladaptive thoughts about panic and anxiety; relaxation training focused on slow diaphragmatic breathing; exposure to bodily sensations designed to mimic sensations experienced in panic. In vivo exposure was conducted via homework beginning at session 17. Session 24 focused on review and relapse prevention.

Panic Focused Psychodynamic Psychotherapy (PFPP; Milrod et al. 1997)

PFPP is a short term manualized therapy (24 sessions/45 min twice-weekly) focused on identifying the psychological—often unconscious—meanings of the patient’s panic symptoms by uncovering avoided feelings and conflicts underlying panic, including: (a) conflicts about separation and autonomy, and dependence, (b) difficulty tolerating anger, aggression and assertion, and (c) guilt and self-punishment expressed via panic symptoms. These conflicts often emerge and are identified in the transference relationship with the therapist (Milrod et al. 1997).

Therapists

The treatments of the 102 patients were provided by 23 therapists (12 female). Forty-eight percent were MDs ($n=11$), 52% PhDs ($n=12$), and 1% PsyD ($n=1$). Therapists had an

average of 12.6 years of postdoctoral experience ($SD=7.60$), with 6.65 years ($SD=6.44$) of experience in time-limited treatment and at least a year of experience in panic disorder treatment. All therapists had received training in the modality delivered prior to the beginning of the research trial and participated in monthly group and individual supervision with expert clinicians during the course of the trial.

Measures

All measures were rated by 13 trained Masters and Doctoral level diagnosticians who were blind to treatment condition and outcome.

Panic Disorder Severity Scale (PDSS; Shear et al. 1997)

Symptomatic outcome was assessed using the PDSS, a well-validated 7-item clinician rated symptom scale, used as primary outcome measure in the RCT, which provides a diagnosis-based, composite, global rating of panic disorder symptom severity. The PDSS has acceptable psychometric properties (Shear et al. 1997) and internal consistency coefficients across assessments in the parent RCT were acceptable-excellent ($\alpha=0.65-0.91$). For the present study we used pre- and post-termination scores. Excellent interrater reliability was found across sites ($\rho_1=.95$; Milrod et al. 2016).

Structured Clinical Interview for Diagnosis for Axis-II Disorders (SCID-II; First et al. 1997)

The SCID-II (First et al. 1997) is a 113-item structured clinical interview designed to diagnose Axis II personality disorders. The current analyses included pre- and post-treatment scores for BPD traits. Excellent interrater reliability was found for overall SCID-II score ($ICC=0.92$), and good reliability for Borderline traits ($ICC=0.78$). Missing data on this measure for the subsample of patients included in this study was imputed using package “mice” (van Buuren and Groothuis-Oudshoorn 2011) in R Statistical Software (R Core Team 2017) that allows creation of multiple imputations by chained equations through pooling of scores drawn from 50 separate imputed datasets. All analyses were conducted twice; once with all available observed data and once with imputed scores and results were not substantially different.

Panic-Specific Reflective Function Interview (Rudden et al. 2005)

A semi-structured interview, administered at intake and termination (Week 12), was used to assess patients’ panic-specific reflective function (PSRF)—the capacity to reflect on the psychological significance of panic symptoms. PSRF

scores were on a scale ranging from -1 (negative RF/psychotic and idiosyncratic) to 9 (exceptional RF). The interviews were audiotaped and subsequently rated by trained raters using a rating scale imported from the RF interview (Fonagy et al. 1998) and the Adult Attachment Interview (AAI; Main et al. 2008). Interrater reliability, as assessed by an intraclass correlation coefficient in a two-way mixed model (ICC[2,2]), was in the good to excellent range ($.72 < \rho_i < .80$).

Quality of Object Relations Scale (QORS; Azim et al. 1991) is a clinician rated 3-item measure assessing the quality of patients' object relations. It has been previously shown to be a reliable and valid measure of the construct investigated (e.g. Hagtvet and Heglend 2008; Høglend 2003; Høglend et al. 2006; Piper et al. 2004; Johansson et al. 2010). Diagnosticians received training on the measure and its training rubrics by the RCT's research director and scoring rubrics. Weekly consensus meetings were conducted to ensure reliability. Diagnosticians conducted 2–4 h of clinical interview in order to determine patients' QORs. The sum of scores for the three items (representing life-long relationships, romantic relationships, and friendships) were used in the analyses. Each item was scored on a scale of 1 through 9 ranging from unstable, primitive, exploitative and maladaptive relationships to stable, mature, mutual and adaptive relationships. Interrater reliability for a single rater was good (ICC[1,2] = .69), and internal consistency, measured with Cronbach's α , was .83 for baseline scores and .80 at termination.

Results

We used Multiple Linear Regression Models with R Statistical Software (R Core Team 2017) to test our hypotheses regarding PSRF and BPD traits as predictors of pre–post change in QORs. To ensure that results would not be the by-product of symptomatic change, we included the baseline levels of symptoms as well as pre–post symptomatic change as covariates in our models. We also included the baseline levels of QOR within the model in order to control for its effect on QOR at termination. In the first step, we included the Treatment \times Symptom Change interaction as well as a main effect of treatment type in the models. We also examined our models including the Site \times Symptom Change and main effect for site, given previously reported site differences in the primary outcome (see Milrod et al. 2016). Given that in these models the main and interaction effects were non-significant, these terms were excluded from further analyses. Post-hoc power calculations (G*Power; Faul et al. 2009) showed that with five predictors included in our models, our sample size would allow us to detect at least a moderately sized effect ($f^2 = > .13$).

Baseline PSRF and Change in PSRF as Predictive of Quality of Object Relations

The model included 93 patients with complete data and explained 54% of the variance in QORs at termination ($p < .01$; 95% CI [.37, .63]). See Table 1. In line with our hypothesis, we found that higher PSRF levels at baseline predicted pre–post change in QORs ($\beta = .22$; $p = .02$), over and beyond the other variables, controlling for pre-treatment QOR scores ($\beta = .70$; $p < .01$), and panic symptoms ($\beta = -.12$; *ns*), as well as pre–post symptomatic change ($\beta = -.26$; $p < .01$). However, contrary to our hypothesis, pre–post change in PSRF did not significantly predict the QOR at termination, over and beyond the other variables ($\beta = .11$; *ns*).

Baseline BPD Traits and Pre–Post Change in BPD Traits as Predictive of Quality of Object Relations

The model included 99 patients with complete data and explained 52% of the variance in QORs at termination ($p < .01$; 95% CI [.35, .60]; see Table 2). Both of our hypotheses were confirmed in this model. Borderline trait levels at baseline significantly predicted pre–post change in QOR ($\beta = -.18$; $p = .02$), such that a greater burden of borderline traits at baseline predicted lower QOR scores at termination, when controlling for baseline QOR scores ($\beta = .53$; $p < .01$), PDSS scores at baseline ($\beta = -.09$, *ns*), pre–post change on the PDSS ($\beta = -.22$; $p = .01$) and pre–post change in borderline traits. Additionally, as predicted, improvement in borderline traits throughout treatment predicted significantly higher QORs at termination ($\beta = -.19$; $p = .02$).

Finally, we tested all predictors (baseline PSRF and BPD traits as well as change in PSRF and BPD) within a single model, including interaction terms. Results were equivalent

Table 1 PSRF and change in PSRF as predictors of quality of object relations at termination?

Predictor	M (SD)	β	sr^2
(Intercept)		3.46 ^a	
PSRF baseline	3.50 (1.15)	.22*	.03
Change in PSRF	0.47 (1.46)	.11	.01
QOR baseline	14.98 (3.51)	.70**	.45
Panic symptoms baseline	13.48 (3.35)	-.12	.01
Change in panic symptoms	- 7.19 (4.36)	-.26**	.05

$n = 93$

PSRF panic-focused reflective function, QOR quality of object relations, β standardized regression weights, sr^2 semi-partial correlation squared

* $p < .05$, ** $p < .01$

^ab value. A significant β -weight indicates semi-partial correlation are also significant

Table 2 Borderline personality disorder (BPD) traits and change in BPD traits as predictors of quality of object relations at termination

Predictor	M (SD)	β	sr^2
(Intercept)		8.66 ^{a,**}	
Borderline traits baseline	.91 (1.49)	− 0.18*	.03
Change in borderline traits	.17 (0.86)	− 0.19*	.03
QOR baseline	15.03 (3.52)	0.53**	.21
Panic symptoms baseline	13.53 (3.31)	0.05	.01
Change in panic symptoms	− 7.30 (4.35)	− 0.18	.03

$n = 99$

QOR quality of object relations, β standardized regression weights, sr^2 semi-partial correlation squared

* $p < .05$, ** $p < .01$

^ab value. A significant β -weight indicates semi-partial correlation are also significant

to those reported in the separate model above, with no change in significance of effects of the predictors, with the exception of slight change in magnitude of the effect of BPD traits at baseline as predictor of QOR improvement ($\beta = - .18$ to $- .14$), which led to reduction of significance ($p = .11$).

Discussion

The aim of this study was to investigate whether baseline levels of panic-focused reflective function levels (PSRF) and BPD traits, as well as pre–post change in PSRF and BPD traits predicted improvement in QORs. Our results suggested that PSRF at baseline predicted patients' QORs at termination, when controlling for baseline QOR scores as well as PDSS scores, with no differences between treatments. These results expand Barber et al.'s (2019) finding that PSRF capacity predicted subsequent symptomatic improvement, and suggest that levels of PSRF play an important role, not only in predicting reduction in panic symptoms, but also in change in other domains of patients' functioning (i.e., QORs).

Clinically, this finding suggests that patients who begin treatment with greater capacity in PSRF (i.e., a more complex and nuanced understanding of the psychological underpinnings of their panic symptoms) may be more likely to improve the quality of their object relations over the course of treatment. This finding provides preliminary empirical evidence that supports one of the premises of mentalization theory (Bateman and Fonagy 2015) and fits with the conceptual framework of panic-focused psychodynamic therapy (Busch et al. 2012): when patients are able to reflect on their emotional and psychological experiences, they are more likely to develop more stable and

coherent representations of others (as well as themselves) and they become better equipped to navigate interpersonal relationships. Thus, patients who demonstrate low PSRF at the beginning of treatment, may benefit from greater focus on improvement in this capacity during treatment, even within psychotherapies that do not necessarily focus on targeting change in reflective function (e.g. CBT for panic disorder).

Contrary to our hypothesis, PSRF improvement over the course of treatment did not predict a better QORs at termination. It is possible that with only two data points (pre–post treatment), we were not able to capture more subtle and nuanced fluctuations in PSRF and QOR over the course of treatment. Also, perhaps given that the PSRF index specifically assesses patients' capacity to reflect on their symptoms, it is related to patients' symptom reduction (as shown by Barber et al. 2019), but may not be directly related to their overall ability to develop positive and healthier mental representations of others. To the best of our knowledge, this is the first study to empirically investigate PSRF as a predictor of QORs. Future research is needed to further empirically investigate these assumptions. Specifically, studies with multiple data points over the course of treatment could allow researchers to test the nuanced temporal associations between fluctuations in PSRF and QOR over the course of treatment. Additionally, studies may investigate whether different aspects of reflective function (such as in-session RF or RF coded from Adult Attachment Interviews) may be related to subsequent change in QOR.

Our results suggest that patients with higher pretreatment BPD traits were less likely to show improvement in QOR. This is in line with existing literature that has demonstrated that both in general and clinical populations, qualifying for even one DSM-defined BPD criterion is prognostic of significant interpersonal dysfunction and psychosocial disability and that even non-diagnostic BPD traits may negatively affect patients' functioning (Ellison et al. 2016; Zimmerman et al. 2012). Additionally, our results support previous findings suggesting that patients with BPD traits are likely to have more negative internal representations of others and struggle with deficits in interpersonal functioning (Lazarus et al. 2014). Furthermore, it highlights the importance of focusing on improvement of maladaptive BPD traits, even in symptom-focused brief psychotherapies (panic disorder in this case), especially in patients who present to treatment with high levels of emotional–interpersonal deficits.

Future studies could investigate whether our findings are specific to patients with panic disorders or whether they generalize to other clinical populations. While research on disorder-specific RF is still in its infancy, recent studies have highlighted the importance of studying this psychological capacity within an interpersonal context in other specific disorders as well (e.g. Ekeblad et al. 2016; Ensink et al.

2014; Minges et al. 2017; Kullgard et al. 2013; Rudden et al. 2009).

Our results also show that the extent to which patients experienced improvement in their BPD traits predicted change in their QORs. This finding extends previous results reported from this sample, showing that improvement in comorbid personality traits predicted subsequent reduction in panic symptoms (Keefe et al. 2018). Our results suggest that improvement in BPD traits specifically may contribute to meaningful changes in patients' representations of others and interpersonal patterns, even when controlling for their improvement in panic symptoms. Overall, our study highlights the importance of focusing on improvement in BPD traits, as they may potentially contribute to meaningful changes in patients' lives (see Choi-Kain et al. 2010 for review of this issue).

When including BPD traits and PSRF within the same model, our results were similar to those found in the independent models. This suggests that while these two constructs are strongly related, they each have a distinct effect on improvement in QORs. While future studies will be needed in order to examine the trajectories of change in the associations between BPD traits and PSRF over time, we can hypothesize on the nature of the association between changes in these two constructs: one possibility is that when patients have a greater understanding of their symptoms within the context of interpersonal relationships (i.e. high baseline PSRF), they are also more likely to exhibit lower impulsivity, greater self- and affect-regulation, and awareness of their emotional needs (i.e. low baseline BPD traits). In turn, they demonstrate greater improvement in these capacities over the course of treatment (i.e. greater change in BPD traits), which facilitates improvement in the quality of their object relations at the end of treatment (i.e. outcome—QOR).

Finally, our results suggested that decrease in BPD traits across both treatments significantly predicted improvement in QORs, when controlling for change in panic symptoms, with no significant treatment differences. This null finding is important because historically, QORs has been studied exclusively within psychodynamic and psychoanalytic psychotherapies (e.g. Clarkin et al. 2007a, b). While the lack of significant treatment effect may be a product of specific characteristics of our sample and our clinical population (this is a primary panic disorder sample) and requires replication, it may suggest that it is important to examine the role of QORs as a therapeutic outcome in non-psychodynamic therapies as well, as this may be a useful and important vehicle in the exploration of an individual's interpersonal functioning and symptom presentation.

Notably, the amount of variance explained in our models is relatively high compared to other psychotherapy process studies. One reason is the high portion of variance

explained by baseline levels of QORs (as shown in Tables 1, 2). This is in line with previous QOR research suggesting that while QORs can improve over time, it is relatively consistent and stable (Azim et al. 1991; Piper and Duncan 1999; Piper et al. 1993). Another possible reason for the high explained variance is a conceptual similarity between the predictors (PSRF and BPD traits). Specifically, while measures for both PSRF and BPD traits are independent and assess distinct constructs, they both include questions regarding patients' experiences within an interpersonal context.

Our results need to be considered within the context of several methodological limitations. These analyses are solely based on pre–post measures, and thus, we were unable to assess patients' change over different treatment phases. Recent work has highlighted the importance of disentangling within- and between-patient variability, in order to assess trait- versus state-levels of change (e.g. Hamaker et al. 2015; Falkenström et al. 2017). Given the nature of our data (pre–post treatment scores) we were unable to use these advanced methodologies in the current study. Future studies could investigate the sequential associations between PSRF, BPD traits, and changes in QORs over the course of treatment and perhaps in long-term follow up as well. Additionally, our QOR measure consisted of only three items. It has been used previously by others (e.g. Høglend 2003; Høglend and Piper 1995; Johansson et al. 2010), but it may provide a more global assessment of patients' interpersonal functioning, rather than a view of their internalized object-relations per se, and thus, it may be less likely to pick up more subtle changes in brief psychotherapies.

Conclusions

The current study presents preliminary evidence suggesting that patients' baseline levels of panic-focused reflective function and borderline personality traits, as well as their pre–post change in comorbid BPD traits predict subsequent improvement in their QORs following 12 weeks of both CBT and PFPP for primary DSM panic disorder. These results demonstrate the importance of addressing patients' personality features, even when the primary treatment target is an Axis-I disorder (i.e., panic disorder). Overall, our study highlights the importance of examining patient characteristics that may predict therapeutic and functioning improvement, and it focuses specifically on secondary outcomes, such as QORs, which play an important role in patients' long-term quality of life and well-being. Specifically, our results suggest that brief manualized psychotherapies for panic disorder may potentially elicit changes in persistent interpersonal difficulties that are generally thought to be stable over time (i.e., internalized representations of others).

Thus, patients may benefit from focus on improving their capacity to reflect on their symptoms, as well as improvement in maladaptive borderline personality traits (e.g., impulsivity, affect regulation, emotional lability, etc.)

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