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Conflict begets conflict: Executive control, mental state vacillations, and the therapeutic alliance in treatment of borderline personality disorder

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Abstract
Clinicians routinely note the challenges involved in psychotherapy with individuals with BPD, yet little research exists on the therapeutic alliance with this population. An important question is, what patient factors contribute to a disturbed alliance with individuals with BPD? Executive attention has been identified as a mechanism of BPD, and mental state vacillations (e.g., idealization/denigration, incoherence in self-concept) are a hallmark of the disorder. The goals of this study were to examine the link between executive attention and the alliance and assess mental state vacillations as a mediator. Thirty-nine participants diagnosed with BPD, participating in a randomized clinical trial, were administered the Attentional Network Task (ANT). Early psychotherapy sessions were coded using the Working Alliance Inventory (WAI). In addition, six items were generated and coded representing in-session vacillations in mental states. Performance on the ANT was related to the alliance ($r = .34$, $p = .035$), as were in-session mental state vacillations ($r = .59$, $p < .001$). A model was supported in which in-session mental state vacillations mediated the relationship between executive attention and alliance. Executive attention was related to therapeutic alliance, and this relationship was found to be mediated by in-session mental state vacillations. These findings emphasize the importance of executive attention in the disorder and uncover a link between poor executive attention and mental state vacillations. Mental state vacillations as a mediator suggests a path in which poor executive attention leads to greater vacillations, which leads to poorer working alliance.

Keywords: personality disorders; alliance; psychoanalytic/psychodynamic therapy

Borderline personality disorder (BPD) is a highly prevalent, debilitating disorder characterized by chronic instability in interpersonal functioning and self as well as difficulties with emotion regulation and impulsivity (Skodol et al., 2002). The most serious consequences of these difficulties are frequent suicidality and self-harm. Despite the development of a number of efficacious treatments for BPD (e.g., Bateman & Fonagy, 2008; Clarkin, Levy, Lenzenweger, & Kernberg, 2007; Linehan, Armstrong, Suarez, Allmon, & Heard, 1991), clinical researchers have noted difficulties in building a strong therapeutic alliance with these patients, impeding progress (Gabbard et al., 1988). Problematic aspects of BPD, most prominently quick vacillations in regard to self and others and rapidly changing, intense affects, are often manifested in the psychotherapy relationship with these patients (Gabbard et al., 1994). Such symptoms frequently interfere with the development of the therapeutic alliance and make treatment a long and difficult endeavor, fraught with recurrent ruptures, perceived empathic failures, chronic evasiveness, angry outbursts, and premature termination (e.g., Gunderson et al., 1989; Yeomans, Gutfreund, Selzer, Clarkin, Hull, & Smith, 1994). Despite the extensive research regarding the therapeutic alliance to psychotherapy outcome and the significance of developing and maintaining a therapeutic alliance with patients with BPD, relatively little research has examined the therapeutic alliance in BPD (e.g., Spinhoven, Giesen-Bloo, Van Dyck, Kooiman, & Arntz, 2007; Yeomans et al., 1994).

Existing research suggests that moment-to-moment changes and shifts in the alliance are common in BPD (Gabbard et al., 1988). Additionally,

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researchers find that improvements in the alliance lead to reduction in BPD pathology (Spinhoven et al., 2007), and that moment-to-moment shifts in alliance interfere with patients' capacity to utilize therapist interventions (Gabbard et al., 1988, 1994), potentially leading to early termination (Gabbard et al., 1994; Gunderson et al., 1989; Posner et al., 2002). For example, a sudden shift from idealizing to derogating the therapist can disrupt the patient's capacity to work with therapist comments and may result in unilateral termination on the part of the patient. Although this evidence suggests that vacillations in mental states may be disruptive to the alliance, little is known about the possible mechanisms involved in such vacillations.

One potentially fruitful avenue for understanding the mechanisms of alliance with patients with BPD is the examination of the contribution of neurocognition to the therapeutic alliance. Although some studies of client variables among other patient populations have examined intelligence as a predictor of psychotherapy outcome with mixed results (Clarkin & Levy, 2003), few have assessed the influence of more specific neurocognitive domains on psychotherapy. Particularly sparse are studies that examine the impact of a cognitive domain that may be linked to mechanisms of the disorder. There are a number of reasons to expect that executive attention, which has some evidence relating it to both self-control and interpersonal functioning (Posner et al., 2002), may impact the therapeutic alliance. Executive attention, an aspect of executive functioning, is a top-down process of attending to and responding to some stimuli while ignoring extraneous stimuli, resolving cognitive conflict between competing responses, and correcting errors (Fan, McCandliss, Fossella, Flombaum, & Posner, 2005). This cognitive domain may be particularly important in explaining difficult therapeutic relationships in psychotherapies with patients with BPD. Research has found that individuals with BPD have relatively impaired executive attention and evidence functional brain abnormalities in areas linked to this cognitive process. Others have suggested that poor functioning in this cognitive domain may be a factor contributing to the disorder (e.g., Coolidge, 2004; Posner et al., 2002).

To date, there is little research on psychotherapy in patients with BPD using neurocognitive or neuroscience methods. Although there is generally growing interest in the use of functional brain imaging to understand the mechanisms of change in psychotherapy and pharmacotherapy, the great majority of this research has examined neural changes in major depression and anxiety disorders (for a review, see Roffman, Marci, Glick, Dougherty, & Rauch, 2005). Two studies with limited sample sizes have examined functional brain changes over the course of psychotherapy in BPD (Lai, Daini, Calcagni, Bruno, & DeRisio, 2007; Schnell & Herpertz, 2007). However, there is more substantial research on BPD that attempts to uncover the neural and neurocognitive mechanisms involved in the disorder using structural and functional brain imaging, electrophysiological approaches, and neuropsychological measures. Consistent findings in this literature suggest that individuals with BPD evidence abnormal frontolimbic circuitry (for a review, see Brendel, Stern, & Silberswieg, 2005), with studies demonstrating both functional and structural abnormalities. Key to the present study are consistent findings of reduced volume and abnormal function of the prefrontal cortex and anterior cingulate cortex (e.g., Hazlett et al., 2005; Tebartz van Elst et al., 2003), brain areas found to underlie executive attention, thus impacting the cognitive conflict resolution process (e.g., Fan et al., 2005) as well as numerous social cognitive functions, such as mentalization and empathy (e.g., Shamay-Tsoory, Tomer, Berger, & Aharon-Peretz, 2003).

Researchers have found that executive attention is also disrupted in BPD on purely cognitive tasks (e.g., Berlin, Rolls, & Iversen, 2005), although executive tasks with an affective component may more severely disrupt cognition among patients with BPD (Domes et al., 2006; Silberswieg et al., 2007). For instance, Posner and colleagues (2002), using the Attentional Network Task (ANT), determined that a specific aspect of attention was impaired relative to healthy controls. The ANT is a flanker task that assesses more basic attentional processes as well as executive attention. Although BPD participants were comparable to controls on measures of more basic attention, they performed more poorly on executive attention. Assessing executive attention in the context of negative emotion, Silbersweig and colleagues (2007) found that on an emotional go/no-go task patients with BPD made more errors of commission under negative no-go conditions, more frequently failing to inhibit a proponent response when the word presented was negative. In addition, on these same trials, these patients demonstrated relatively decreased activation of the ventromedial prefrontal cortex, including the medial orbitofrontal cortex and the subgenual anterior cingulate.

These deficits in executive attention may relate to defining features of BPD, such as instability in one's experience and sense of self and others as well as in goals, beliefs, and morals (Bender & Skodol, 2009; Gunderson & Lyons-Ruth, 2008; Levy et al., 2006). Dysfunction in the prefrontal cortex and/or executive attention may result in difficulty integrating

complex information and contribute to chaotic responding and unstable behavior (Miller & Cohen, 2001). Within psychotherapy, a number of clinical researchers have suggested that vacillations in mental states are expressed in contradictory statements by the patients concerning their wishes, desires, and interests as well as a markedly inconsistent experience of the therapist and others (Dimaggio et al., 2005; L. M. Horowitz, 1994; M. J. Horowitz, Milbrath, Ewert, Sonneborn, & Stinson, 1994; Liotti, 2004; Semerari et al., 2005). Vacillations in mental states also lead to wavering on commitment to goals and in-session collaboration and demands from the patient for help followed by evasive maneuvers (M. J. Horowitz et al., 1994; Liotti, 2004; Semerari et al., 2005). Dimaggio and colleagues (2005) hypothesized that mental state shifts or vacillations are triggered by real and imagined experiences in relationships and by limitations in the creation of "metarepresentations." These deficits in metarepresentations or metacognitions may interfere with the patients' capacity to integrate seemingly contradictory information and thus leave them at the whim of whatever experience they are having in the moment. Interestingly, Prunetti and colleagues (2008) found that metacognitive failure, which is hypothesized to lead to vacillating mental states, occurs following therapist interventions of validation, potentially because validation heightens relationship closeness, as hypothesized by Dimaggio et al. (2005). Elsewhere, using lagged log-linear sequential analysis to examine patterns of shifts from one state of mind to another, M. J. Horowitz and colleagues (1994) found that such shifts were related to conflictual topics. Research also hints at the possibility that such chaotic changes in mental states may be linked to compromised executive attention (Levy et al., 2005; Minzenberg, Poole, & Vinogradov, 2008; Lysaker et al., 2008). For instance, Levy and colleagues (2005), in a sample of patients with BPD, found that low reflective function, a measure of metarepresentation or metacognition, predicted greater levels of impulsivity on the Continuous Performance Task and deficits in concept formation on the Wisconsin Card Sorting Test. Likewise, in a study with schizophrenic patients, Lysaker et al. (2008) found that the metacognitive ability of being aware of one's thoughts was related to mental flexibility and recognizing others' needs, whereas the metacognitive ability of recognizing the independence of relationships was related to executive attention.

Theories of executive attention often highlight the interplay of automatic and controlled processes and may further argue for a relationship between executive attention and mental state vacillations. In dual-process models, fast, unconscious, automatic, associative processes are thought to be controlled and inhibited by slower, conscious, effortful processes that are reflective and rest on rule-based inferences (Barrett, Tugade, & Engle, 2004). Among individuals with intact executive attention, significant internal events, such as strong affects, associations, or impulses, which comprise automatic processes, can be monitored and controlled with more effortful processes. However, those who demonstrate poor executive attention would be predicted to react in a more impulsive and chaotic manner. Rather than experiencing stability and coherence by effectively controlling automatic processes, they are more likely to be controlled by strong affects and urges arising in a specific moment. This compromised executive attention may thus result in more chaotic (e.g., vacillating) mental states. Like executive attention, these mental state vacillations are hypothesized to be expressed not only in numerous aspects of borderline behavior but also in the therapeutic relationship.

In the present study, we examined the relations between executive attention as assessed using Posner's ANT procedure, the therapeutic alliance as assessed with the Working Alliance Inventory (WAI), and a measure of mental state vacillation in individuals with BPD. We hypothesized that deficits in executive attention, particularly in the ability to resolve cognitive conflict, would be related to poorer working alliance. Given the paucity of research in this area, we had no reason to predict that different aspects of the alliance—bond, agreement on tasks, and agreement on goals—would be differentially affected. Additionally, we predicted that deficits in executive attention would be related to more frequent vacillation of mental states, and that such vacillations would mediate the relationship between executive attention and the alliance.

Method

Participants

Thirty-nine women between the ages of 18 and 50 years were recruited at the beginning of their treatment from an ongoing randomized controlled trial (RCT) for women with BPD (Clarkin et al., 2007). In that study, 90 participants were reliably diagnosed with BPD by trained clinicians. Axis I disorders were diagnosed using the Structured Clinical Interview for the DSM-IV (First, Gibbon, Spitzer, & Williams, 1997). Axis II pathology was assessed using the International Personality Disorder Examination (Loranger, 1999). There were no differences between the 39 participants who completed neurocognitive assessments and the 51

patients who did not in terms of demographics, comorbid diagnoses, or severity of psychopathology and level of functioning (e.g., Global Assessment of Functioning scores).

Executive Attention

The ANT (Fan, McCandliss, Sommer, Raz, & Posner, 2002) assesses cued reaction time and performance during a flanker task in order to assess the efficiency of three aspects of attention: alerting, orienting, and conflict. Alerting is the basic attentional process of achieving and maintaining an alert state. Orienting is an attentional process of selecting information from sensory input. Conflict is a measure of executive attention defined as resolving conflict between competing responses. A portion of the ANT is a flanker task in which participants press either a right or a left key depending on what direction the central arrow points. A flanker task is a classic neurocognitive test in which a middle target is flanked by other stimuli, such as a middle arrow flanked by arrows going in the same direction (congruent) or a middle arrow flanked by arrows going in an opposite direction (incongruent). The target conditions are preceded by one of four cues: no cue, center cue, double cue, or spatial cue. These cues are presented to assess alerting and orienting. Alerting, orienting, and conflict reaction times were calculated as described by Posner and colleagues (2002). Cognitive conflict, the variable assessing executive attention, was calculated, as in prior research, by subtracting the reaction times in incongruent trials from reaction times in congruent trials.

Therapeutic Alliance

The WAI (Horvath & Greenberg, 1989) is a widely used, well-validated pantheoretical measure based on Bordin's (1979) conceptualization of the working alliance as consisting of mutuality between client and therapist on in-session behaviors, mutual endorsement on outcomes, and a strong attachment. The scale consist of 36 items, rated on a Likert-type scale ranging from 1 to 7 (7 = *high*). The WAI is composed of three subscales representing agreement on in-session tasks, agreement on goals, and the quality of the therapeutic bond. Tichenor and Hill's (1989) observer-rated adaptation (WAI-O) was used in the present study. Multiple studies of the WAI-O have demonstrated high internal consistency ($\alpha = .93$) and predictive validity (Busseri & Tyler, 2003; Erdur, Rude, Baron, Draper, & Shankar, 2000; Horvath & Greenberg, 1989). In a meta-analysis of 24 studies of alliance, Horvath and Symonds (1991) found that observer-rated alliance was a stronger predictor of outcome than therapist-rated alliance. We choose to use the WAI-O based on Cecero and colleagues' (Cecero, Fenton, Frankforter, Nich, & Carroll, 2001; Fenton, Cecero, Nich, Frankforter, & Carroll, 2001) findings that the observer-rated measures of alliance, including the WAI-O but not the patient-rated or therapist-rated adaptations, were related to outcome in a clinical trial for substance abusers. They suggested that the higher predictive validity of the observer-rated measures may be due to observers being "less susceptible to situational demands or transference and countertransference issues that may influence an evaluation of alliance" (Fenton et al., 2001, p. 267). Cecero et al. further noted that the use of self-report and therapist-report alliance measures may be one of the reasons why a weaker relationship between alliance and outcome is reported in the substance abuse literature than in the general literature (see Barber et al., 1999; Connors, Carroll, DiClemente, Longabaugh, & Donovan, 1997). Relatedly, they suggested that, for patient populations such as substance abusers or those with personality disorders, the observer-rated measures are preferable because of the difficulties that these patients have in providing reliable evaluations of their experience.

Using the WAI-O, two advanced doctoral students (Joseph E. Beeney and Rachel H. Wasserman) with 4 years of supervised clinical experience with patients with BPD were trained to reliability on a separate sample of patients with BPD (Clarkin et al., 2001) and then coded therapeutic alliance in two early therapy sessions in the current sample. Initial training consisted of 20 hr of didactic instruction in the use of the measure, followed by 20 hr of application of items to clinical examples before the reliability training on the separate sample. Finally, after beginning coding on the current sample, coders met weekly to discuss ratings in order to maintain reliability and avoid rater drift. Mean intraclass correlation coefficient (ICC) for the two coders in the current sample was .80 for the 39 sessions.

Vacillations in Mental States

On the basis of the idea that a core feature of BPD is disturbance of self (Skodol & Bender, 2003) and interpersonal relationships (Gunderson & Lyons-Ruth, 2008), characterized by rapid fluctuations in perceptions of others (idealization and denigration) and chaotic unintegrated representations of self, we developed a multi-item, observer-rated measure—the Therapist Rating Scale for BPD (Wasserman, Levy, Beeney, & Stonebraker, 2007)—to capture this characteristic of BPD pathology. These observer-rated items assessed (a) vacillations in sense of self;

(b) vacillations in conceptualization of problems; (c) vacillations in perception of therapist; (d) vacillations in commitment to therapy; (e) vacillations between requests for help and evasive behaviors; and (f) splitting (see Appendix for examples). Each item was rated on a 4-point Likert-type scale indicating the degree to which it was present in the session (1 = *not present*). Patients were rated in a single session on six items representing in-session vacillations in mental states by Beeney and Wasserman, who were trained to reliability for scoring mental state vacillations on a separate sample of patients with BPD (Clarkin et al., 2001). Initial training consisted of 20 hr of didactic teaching followed by 20 hr of application to clinical examples. Finally, in the current sample, coders met weekly to discuss ratings in order to maintain reliability and avoid rater drift. Cronbach's alpha for the six items was .84. Mean ICC for the two coders was .72.

Treatments and Therapists

Participants were drawn from an ongoing RCT comparing transference-focused psychotherapy (TFP), dialectical behavior therapy (DBT), and supportive therapy (SPT; Clarkin et al., 2007; Levy et al., 2006). Ten participants received TFP, 15 underwent DBT, and 14 received SPT. TFP is a modified manualized psychodynamic treatment for patients with BPD. Its primary goal is to reduce symptomatology and self-destructive behavior through the modification of representations of self and others as they are enacted in the treatment. The primary focus of TFP is on the predominant affect-laden themes that emerge in the relationship between patients and their therapists in the here and now of the transference. DBT is a manualized cognitive–behavioral treatment with two components: (a) individual therapy and (b) group skills training. The individual treatment focuses on a hierarchy of target behaviors, which the patient tracks on a daily basis with diary cards. Behavioral analyses of the pattern and chain of thoughts, emotions, and events resulting in suicidal and self-mutilating acts take place routinely to help the patient identify triggers and alternative strategies for coping. SPT is a manualized psychoanalytically oriented treatment for borderline patients adapted from one of the most common SPT treatments. Its primary goal is to bring about changes by developing a healthy collaborative relationship with the therapist and replacing self-destructive enactments with verbal expression of conflicts.

Therapists in each of the three treatment conditions were selected based on prior demonstration of competence in their respective treatment. To ensure ongoing therapist adherence and competence, all treatments were supervised on a weekly basis by experts in each treatment. Before being assigned patients, all therapists selected for the study were judged by treatment cell leaders to be both adherent to their respective manual and competent in using the specific techniques of their respective modality. Throughout the study, all therapists regularly videotaped their sessions and were supervised in a group on a weekly basis. All TFP, DBT, and SPT therapists were experienced with patients with BPD and in their respective modality. All had postdoctoral training and experience ranging from faculty/staff psychiatrists with at least 10 years of experience to faculty/staff psychologists with at least 2 years of experience treating patients with BPD and specific training in TFP, DBT (all therapists attended multiple intensive trainings with Linehan or other certified trainers), or SPT. For a fuller description of therapists, see Levy et al. (2006) and Clarkin et al. (2007).

Results

As shown in Table I, the relationship between indices of the ANT and two observer ratings using the WAI were assessed using correlational analyses. As expected, ANT alerting and orienting were unrelated to the working alliance. However, conflict was moderately correlated with the early therapeutic alliance. Because the ANT conflict score is a reaction time measure, higher scores indicate more difficulty resolving conflict trials. Thus, more difficulty on conflict trials was related to WAI scores indicating poorer alliance. To further investigate whether facets of the therapeutic alliance were more impacted by difficulties with executive attention, we examined the relationship of ANT indices with the three factors of the WAI: Agreement on Goals, Agreement on Tasks, and Therapeutic Bond (Tracey & Kokotovic, 1989). All three factors were significant. There was a trend toward significance for Agreement on Tasks between therapist and client.

Table I. Correlations between Alliance and the ANT

Variable	ANT-alerting	ANT-orienting	ANT-conflict
WAI-O total	.03	.03	−.34*
WAI-O Bond	−.02	.05	−.37*
WAI-O Tasks	.05	.11	−.29**
WAI-O Goals	.03	−.06	−.33*
Mental state vacillations	.04	.01	.34*

Note. WAI-O = Working Alliance Inventory observer-rated adaptation; except accuracy, all ANT scores = reaction time. ANT, Attentional Network Task

*$p < .05$. **$p < .10$.

The relationship between vacillations in mental states and the therapeutic alliance was also assessed using correlational methods. Vacillations were highly associated with the therapeutic alliance, $r(38) = -.59$, $p < .001$. More frequent vacillations were related to poorer therapeutic alliance.[1]

To further elaborate our model, we investigated whether mental state vacillations are the active ingredient through which executive attention impacts the alliance between patient and therapist. To test a model by which executive attention impacts the therapeutic alliance as a function of vacillations in sense of self and others, mediational analysis was conducted using both the Baron and Kenny (1986) steps and the bootstrapping method (Preacher & Hayes, 2004). As already reported, executive attention and the therapeutic alliance (IV and DV [independent and dependent variable]) and mental state vacillations and the therapeutic alliance (mediator and DV) were significantly correlated. Mental state vacillations and executive attention were also correlated, $r(37) = .34$, $p = .034$. Consistent with mediation, using regression analyses, a large effect size remained between the mental state vacillations and the therapeutic alliance after controlling for ANT scores, $\Delta F(1, 36) = 14.43$, $\Delta R^2 = .25$, $p < .001$. Also consistent with a valid mediator, when entering executive attention into the second step of the regression model, controlling for vacillations, the relationship between executive attention and therapeutic alliance dropped below significance, $\Delta F(1, 36) = 1.23$, $\Delta R^2 = .02$, $p = .274$. Thus, mental state vacillation was supported as a mediator of the relationship between executive attention and alliance. This model is detailed in Figure I. At the same time, executive attention was ruled out as a mediator between the relationships of the other variables. Although the Sobel test has been recommended to test the significance of the indirect effect (Baron & Kenny, 1986), an assumption of the test is that the indirect effect is normally distributed, making it unsuitable for small sample sizes (Preacher & Hayes, 2004). Instead, Preacher and Hayes's (2004) published SPSS macro was used to test the indirect effect, using bootstrapping with 5,000 resamples from the data set. The bootstrapping estimate of the indirect effect of ANT-conflict on the WAI through mental state vacillations was different from zero with a 95% confidence interval (–.11; lower limit: –.25; upper limit: –.02). Thus, the bootstrap estimate supports that the mediation effect of mental state vacillations is significant at $\alpha = .05$.

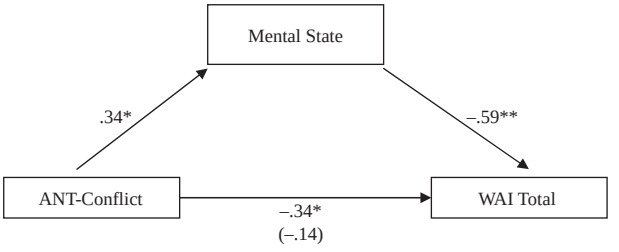

Figure I. Model demonstrating a link between executive attention and alliance, with mental state vacillation (MSV) as a mediator. MSV and Working Alliance Inventory (WAI) total, controlling for Attentional Network Task (ANT)-conflict, $\Delta F(1, 36) = 14.43$, $\Delta R^2 = .25$, $p < .001$. ANT-conflict and WAI total, controlling for MSV, $\Delta F(1, 36) = 1.23$, $\Delta R^2 = .02$, $p = .274$.

Discussion

We examined the relationship between executive attention, a cognitive domain discussed as a potential mechanism of BPD, and the observer-rated working alliance between patient and therapist in an outpatient sample of patients with BPD. In addition, we assessed whether observer rated in-session vacillations in mental states, a construct relevant to BPD, would mediate the relationship between executive attention and the working alliance. On the basis of prior research highlighting the relationship between executive attention and interpersonal functioning (Posner et al., 2002), we hypothesized poorer executive attention would be related to disturbed working alliance and that in-session vacillations would mediate this relationship.

All links in our hypothesized model were supported. As predicted, there was a relationship between executive attention and quality of the therapeutic alliance: Poorer executive attention was associated with a poorer therapeutic relationship. Poor executive attention predicted a greater presence of mental state vacillations during therapy, suggesting that, as hypothesized, executive attention may be influential in chaotic in-session presentation. Although other explanations are plausible, we found support for a model in which poor executive attention allows for more vacillation in mental states, which leads to a more disturbed alliance. Although executive attention affects the alliance, our findings suggest that mental state vacillation is the mechanism through which this relationship exists.

These findings are consistent with two alternative but not mutually exclusive explanations for conceptualizing mechanisms of change in psychotherapy. First, therapy may work by increasing mentalizing capacity in order to improve executive attention (Allen & Fonagy, 2006). Second, therapy may work through skills training (e.g., mindfulness) to improve executive attention. Regarding the former, Levy and colleagues (2006) have demonstrated that patients with BPD treated for 1 year with TFP

demonstrate improved capacity for mentalizing. In addition, Levy and colleagues (2005) have found mentalizing capacity to be inversely related to impulsivity on a continuous performance test, a measure of cognitive control, and performance on the Wisconsin Card Sorting Task, a measure of executive function. Thus, it is plausible that improvements in mentalizing might lead to similar improvements in executive attention. In addition, because a focus on mentalization in patients with BPD commonly involves attention to mental state vacillations, it is also plausible that this focus may impact both executive attention and interpersonal relationships (Levy et al., 2006). Regarding the latter point of intervention, focusing directly on executive attention has been shown to result in improvements in this cognitive domain among healthy controls. Tang and Posner (2009) reviewed controlled trials utilizing computer-based training and meditation (akin to mindfulness). They found that both training methods demonstrated consistent effects on executive attention with healthy participants. Thus, skill-based treatments such as DBT (Linehan et al., 1991), which focus on mindfulness training, and treatments geared toward developing greater mentalizing capacities by explicitly focusing on integrating alterations between mental states such as TFP may both affect the common neurocognitive correlate of executive attention but by different routes. It is also important to note that executive attention and constructs like mentalization are distinct and, although related cross-sectionally, may not covary over time (Lysaker, Dimaggio, Buck, Carcione, & Nicolò, 2007).

An important possibility highlighted by our findings is that deficits in neurocognition may be a particularly useful concrete marker of mental state vacillations. Gabbard and colleagues have argued for a focus on patient collaboration as a marker of the alliance (Colson et al., 1988). Executive attention and/or vacillations in mental states may inhibit the patient's ability to join with the therapist in mutual collaboration toward change. This link between executive attention and working alliance may involve functions of areas of the anterior cingulate cortex and prefrontal cortex, both found in numerous studies to be abnormal among patients with BPD (for a review, see Brendel et al., 2005). Resolving cognitive conflict activates the dorsal anterior cingulate cortex and lateral and medial prefrontal cortex, among other areas (Fan et al., 2005). The prefrontal cortex is part of the network thought to integrate various sensory and motor information and mental and visceral states essential to self-regulation and emotional responding, and its functioning is fundamental to maintaining representations of salient goals (Miller & Cohen, 2001). Dysfunction in the prefrontal cortex may reflect a compromised ability to integrate such information and maintain goal representations, contributing to chaotic responding and lack of coherence in identity and thus compromised collaboration with the therapist on tasks toward mutual therapeutic goals. Consistent with our findings of disruptions in and difficulty repairing cooperation with therapists, King-Casas and colleagues (2008), using a functional magnetic resonance imaging (fMRI) paradigm, found that patients with BPD are prone to ruptures in cooperation and have difficulty repairing these ruptures. Behavioral and imaging data suggested that a mentalizing deficit interfered with the capacity to send and receive social cues of cooperation and safety. Our findings may illuminate two factors—vacillating mental states and deficits in executive attention—that contribute to difficulties in mentalization and maintaining interpersonal collaboration among patients with BPD.

The strengths of this study include its use of (a) a well-defined and reliably diagnosed group of patients for whom the therapeutic alliance is particularly relevant; (b) a concrete, computer-based neurocognitive assessment that has been well linked to brain functions through fMRI studies (Fan et al., 2005); (c) observational coding of therapeutic alliance (cf. Fenton et al., 2001); and (d) mediational analysis to test models of a possible mechanism underlying the kinds of difficulties seen in the psychotherapy treatment of patients with BPD. Despite these strengths, there are a number of limitations that deserve mention, one of which involves the correlational design. Although the assessment of executive attention occurred before the ratings from the psychotherapy sessions, the correlational design precludes making causal inferences. It may be that a primary deficit in executive attention facilitates BPD mental state vacillations. Additionally, as with all correlational studies, an unmeasured variable might have been operating and might explain the relationships we found. For example, it may be that incoherent identity, splitting, and other processes related to mental state vacillations overwhelm cognition. Finally, because we did not examine these relationships in patients with other diagnoses (e.g., major depression), we are unsure of the specificity of our findings. Finally, we did not assess either therapist or patient ratings of alliance. Although some research indicates that patient-rated alliance tends to be most strongly correlated with outcome, other studies demonstrate that observer-rated alliance predicts outcome better in complex and severely disturbed samples such as ours (Fenton et al., 2001). As we previously indicated, the higher

predictive validity of the observer-rated measures in samples such as ours may be due to observers being less biased by situational aspects, defensive needs, or attribution biases.

Future research should seek to extend the present findings by examining change in executive attention and the therapeutic relationship over the course of psychotherapy in order to better examine causality. The use of functional imaging in future studies could help determine whether activation in brain areas related to executive attention improve and perhaps even normalize as a result of successful therapy.

Conclusion

Using a novel approach to investigate the working alliance, we found that poorer executive attention is related to more disturbed alliance with patients with BPD, but this relationship was mediated by vacillations in mental states. Importantly, executive attention did not mediate the relationship between mental state vacillations and working alliance. Thus, executive attention may contribute to mental state vacillations, but because it is not a mediator, mental state vacillations more directly affect the alliance. Our findings suggest a number of avenues for research utilizing neurocognition, neuroimaging, and the working alliance as an important approach to understanding both the mechanisms of psychopathology in BPD and targets for psychotherapy with these patients.

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Note

[1]Per a reviewer's recommendation, we examined whether there were differences in executive attention, mental state vacillations, or alliance as a function of treatment group (e.g., TFP or DBT). There were no between-group differences on executive attention, alliance, or mental state vacillations.

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Appendix: Therapist Rating Scale for BPD Observer-Rated Items

Item	Example
Vacillations in sense of self	Seeing oneself as impervious to the influence of others and the next minute feeling controlled by others.
Vacillations in conceptualization of problems	One minute admonishing the therapist for not being concerned enough about her distress and the next telling the therapist that there is nothing wrong with her and she does not need therapy.
Vacillations in perception of therapist	Telling the therapist that she is the greatest therapist ever and the next moment lashing out at the therapist that nothing she does is helpful and that attending therapy is a waste of time.
Vacillations in commitment to therapy	Begging the therapist for more sessions but then failing to show up, arriving late, talking about trivial matters, not engaging in the therapy process or in cognitive–behavioral treatments, failing to complete homework assignments.
Vacillations between requests for help and evasive behaviors	The patient demanding that the therapist help her and then not engaging in the therapeutic process with the therapist.
Splitting	One moment idealizing a significant other and seeing him as a perfect spouse and the next moment derogating him and seeing him as the worst spouse in existence.

Note. BPD, borderline personality disorder.