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**THE ROLE OF WORKING ALLIANCE IN THE TREATMENT OF
BORDERLINE PERSONALITY DISORDER**

A Dissertation in

Psychology

by

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ABSTRACT

The primary aim of the proposed research is to understand a proposed mechanism of change in psychotherapy for Borderline Personality Disorder (BPD) through examination of the relationship between alliance and outcome in two well established treatments for BPD. BPD is costly, painful, debilitating, and deadly, and thus, represents a serious clinical and public health concern. Across multiple studies of Axis I psychopathology, alliance has been shown to be a robust predictor of outcome. In addition, formation of an alliance has been written about extensively in theoretical descriptions of the treatment of BPD. However, little systematic research has been conducted to determine the relationship between alliance and outcome in BPD. The maximization of efficacy in the treatment of BPD depends upon understanding the specific mechanisms that characterize the disorder and that determine clinical change. Here, we examined working alliance in BPD, with a well standardized observer-rated measure (WAI) and a well characterized and representative sample of reliably diagnosed patients. We used archival data from a randomized clinical trial, including well characterized and standardized treatments to minimize competence as a confound for alliance. Through direct investigation of the alliance in a well controlled study of treatments for BPD, we begin to answer important questions regarding the role of alliance in therapeutic change with this population. The *long-term goal* of this research program is to elucidate the technical, relational, and contextual mechanisms of change in the treatment of specific psychological disorders, and to facilitate the translation of these findings into the validation and dissemination of efficacious treatments. Three foundational questions regarding the alliance in BPD were posed: 1) do treatment differences exist in the formation of early alliance, in line with

emphasis on supportive and validating techniques early in treatment? 2) is alliance predictive of treatment retention/termination in this population? And 3) is alliance predictive of treatment response in BPD? Analysis of variance, survival analysis and hierarchical linear models were used to address these questions. It was found that working alliance was positive and equivalent treatments indicating that despite technical differences in approach, that therapists in all three treatment conditions were able to foster generally positive working relationships with their patients in the initial sessions of therapy. With respect to early termination, treatment type was found to be marginally associated with risk of dropout while working alliance was found to be significantly predictive of treatment retention. Hierarchical linear models were used to investigate the relationship of working alliance to initial symptomatic distress and functional impairment as well as to change during treatment. Consistent with predictions, working alliance was found to be associated with functional impairment but not symptomatic distress at the start of treatment. Working alliance was predictive at trend levels of change in global severity of symptoms across treatments. In addition, with respect to global assessment of functioning a trend level three way interaction among working alliance, treatment condition and time was found indicating that working alliance is significantly more related to change in global functioning in TFP than in SPT and marginally more related to change in global functioning in DBT than SPT. Working alliance was not found to predict change in the four other outcome variables investigated. Implications of these findings, strengths and limitations, and future directions for research are discussed.

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CHAPTER 1

INTRODUCTION

Significance

BPD is highly prevalent, with estimated occurrence rates of 1 to 4% in the general population (Lenzenweger, Loranger, Korfine, & Neff, 1997; Samuels, 2002; Swartz, Blazer, George, Winfield, 1990; Swartz et al., 1989; Torgerson, Kringlen, & Cramer, 2001; Zimmerman & Coryell, 1989), 9 to 11% among psychiatric outpatients (Widiger & Frances, 1989; Zimmerman, Rothschild, & Chelminski, 2005), and up to 20% of psychiatric inpatients (Widiger & Frances, 1989). According to the DSM-IV (APA, 2000), BPD involves a pervasive, longstanding, and inflexible pattern of instability in affect, behavior, self-image, and interpersonal relationships that begins by early adulthood. Individuals with this disorder demonstrate profound impairment in general functioning (Skodol et al., 2002; Widiger & Weissman, 1991), marked impulsivity (Krueger, 1993; Russ, Shearin, Clarkin, Harrison, & Hull, 1993; Zanarini, 1993), and high levels of anger and hostility (Gardner, Leibenluft, O'Leary, & Cowdry, 1991; Raine, 1993). They are at increased risk for self-injurious and suicidal behaviors (Black, Blum, Pfohl, & Hale, 2004; Soloff, Lis, Kelly, Cornelius, & Ulrich, 1994) with an estimated suicide completion rate of up to 10% (McGlashan, 1986; Oldham et al., 2001). BPD is substantially comorbid with other personality disorders, as well as Axis I disorders (Fyer, Frances, Sullivan, Hurt, & Clarkin, 1988; Nurnberg et al., 1991; Sullivan, Joyce, & Mulder, 1994; Zanarini et al., 1999; Zimmerman & Coryell, 1990). Furthermore, the presence of BPD negatively affects the treatment efficacy for a number of Axis I disorders (Clarkin, 1996; Cooper, Coker, & Fleming, 1996; Greenberg, 1995;

Nurnberg et al., 1989; Shea, Widiger, & Klein, 1992) and is less responsive to pharmacotherapy (Pope, Jonas, Hudson, Cohen, & Gunderson, 1983; Soloff, 1997; Soloff, 1998; Soloff, 2000; Soloff et al., 1993). Patients with BPD utilize higher levels of services in emergency rooms, day hospital and partial hospitalization programs, outpatient clinics and inpatient units, and often in chaotic ways, with repeated patterns of dropout, erratic psychotherapy attendance, refusal to take medications as prescribed, and pervasive noncompliance (Bongar, Peterson, Golann, & Hardiman, 1990a; Zanarini, Frankenburg, Khera, & Bleichmar, 2001). Given these facts, BPD is a serious, life threatening, mental health problem. It is prevalent, painful, debilitating, and deadly, and thus, represents a major public health problem.

Despite numerous difficulties associated with treatment of individuals with BPD, including chronic and pervasive non-compliance (Gunderson et al., 1989; Kelly, Soloff, Cornelius, George, et al., 1992; Skodol, Buckley, & Charles, 1983; Waldinger & Gunderson, 1984), recent psychotherapy outcome studies have reported evidence for the efficacy (Bateman & Fonagy, 1999; Clarkin, Levy, Lenzenweger, and Kernberg, 2007; Clarkin, Levy, Lenzenweger, & Kernberg, 2007; Koons et al., 2001; Levy, Clarkin, & Kernberg, 2006; Linehan, Armstrong, Suarez, Allmon, & Heard, 1991; Linehan et al., 2002; Linehan et al., 1999; Turner, 2000; Verheul et al., 2003) and effectiveness (Blum, Pfohl, John, Monahan, & Black, 2002; Bohus et al., 2004; Brown, Newman, & Charlesworth, 2004; Clarkin et al., 2001; Ryle & Golyukina, 2000; Stevenson & Meares, 1992) of a number of treatments for BPD (Dialectical Behavior Therapy, Schema Focused Therapy, Mentalization Based Therapy, and Transference Focused Psychotherapy). Originators of these treatments (Bateman & Fonagy, 2006; Kernberg,

1984; Linehan, 1993) and clinical writers throughout the twentieth century (Gabbard, 1988; Gabbard et al., 1994; Kohut & Wolf, 1978; Masterson, 1978) have discussed the importance of the alliance as an underlying mechanism and/or context within which change occurs. In addition, alliance has been shown to be a powerful predictor of outcome for other disorders (Horvath & Bedi, 2002; Horvath & Symonds, 1991; Martin, Garske, & Davis, 2000). However, very little empirical research has examined the role of the alliance in the treatment of BPD. Therefore, the role of alliance in BPD represents a critical area of investigation in order to address this serious mental health concern.

Alliance as a Robust Predictor of Outcome

Since the late 1970's both comparative outcome and meta-analytic studies strongly suggest that psychotherapy is effective in treating a variety of psychological disorders (Anderson & Lambert, 1995; Crits-Christoph, 1992; Lambert & Olges, 2004; Seligman, 1995; Smith & Glass, 1977; Smith, Glass, & Miller, 1979; Wampold, 2001; Wampold et al., 1997). Efficacy and effectiveness studies have established that psychotherapy is effective in alleviating symptoms, increasing individuals' ability to function and contribute to society, and in improving quality of life (Chambless & Ollendick, 2001; Garfield & Bergin, 1994; Lambert, Bergin, & Garfield, 2004; Lambert & Olges, 2004). However the question initially posed by Paul (Paul, 1967), "What treatment, by whom, is most effective for this individual with that specific problem, and under which set of circumstances?" (p111) still remains largely unanswered. In order to understand what promotes change, one approach is to directly study treatment processes. Kazdin notes that psychotherapy process research is likely to be useful in providing evidence for or against the theoretical propositions that guide different psychological

treatments (Kazdin, 2001; Kazdin, 2000; Kazdin, 2002). Likewise, Horvath and Luborsky note that psychotherapy “research is unlikely to provide guidance to clinical practice unless the relations between clearly defined therapist actions in specific contexts and the effect of these interventions on process or outcome can be demonstrated” (1993, pp. 568). The therapeutic alliance has emerged as a consistent predictor of outcome in numerous well controlled studies of Axis I psychopathology (Horvath & Bedi, 2002; Horvath & Symonds, 1991; Martin et al., 2000), and therefore, represents an important area for contemporary treatment research (Barber, 2000; Castonguay & Beutler, 2006a; 2006b; Castonguay, Constantino & Grosse Holtforth, 2006; Kazdin, 2001; Kazdin, 2000; Wampold, 2001). One of the most widely used measures of alliance is the Working Alliance Inventory (WAI; Horvath & Greenberg, 1986; Martin et al., 2000), based on Bordin’s (1979) integrative definition of alliance comprising three aspects of the relationship between patient and therapist: 1) agreement between patient and therapist on the goals of the therapy; 2) patient’s agreement with the therapist that the tasks of the therapy will address the problems the patient brings to treatment, and 3) the quality of the interpersonal bond between the patient and therapist. Among the strengths of the WAI are its attention to multiple aspects of the working relationship, its high internal consistency and reliability (Horvath & Greenberg, 1986; Horvath & Greenberg, 1989), its atheoretical nature (i.e. it is not tied to a specific theoretical orientation), and its availability for use from multiple perspectives (patient, therapist, observer). Despite the growing evidence of the impact of alliance on psychotherapy outcome (Horvath & Bedi, 2002; Horvath & Symonds, 1991; Martin et al., 2000), little research has systematically investigated the role of the alliance in treatments for individuals with Borderline Personality Disorder.

The Role of Alliance in BPD

Theoretical writings on BPD and other personality disorders (Adler, 1979; Gabbard, 1988; Gunderson, Leonhard, Sullivan, Sabo, 1997; Kernberg, 1976; Masterson, 1978) indicate that the alliance may not only be an important context within which treatment operates but may also represent an index of treatment success (Clarkin & Marziali, 1992; Gunderson, Leonhard, Sullivan, Sabo, 1997; Kernberg, 1984; Masterson, 1978). Recently, clinical researchers have noted that core symptoms of BPD, including unstable and intense interpersonal relationships, marked impulsivity, and frequent outward displays of anger, often lead to difficulty in establishing and maintaining a therapeutic alliance (Linehan, 1993; Rockland, 1992; Yeomans, Gutfreund, Selzer, & Clarkin, 1994). In fact, successful negotiation of these tasks, leading to a stable therapeutic relationship, has been viewed by many as the sine qua non of successful psychotherapy in this population (Gabbard et al., 1988; Linehan, 1993). Despite agreement on the importance of this construct, there has been substantial disagreement about how best to foster a positive alliance with patients with BPD. Kernberg (1976) stresses the importance of early attention to negative aspects of the alliance in a direct attempt to remediate the patient's misperceptions of the therapist and to increase realistic impressions of the therapist as a helpful participant in the treatment. Linehan (1993) and Rockland (1992) have emphasized attention on and building of positive aspects of the relationship early in treatment, and discourage explicit attention to negative relational aspects.

Despite an extensive literature elaborating theoretical descriptions of the importance of the alliance in treatment of BPD, there are few studies that report alliance data in this

population (Gunderson et al., 1997; Spinhoven et al., 2007; Turner, 2000). Further compounding the problem is the absence of data to support or refute varying hypothesized interventions aimed at fostering the alliance. Given the paucity of research regarding the role of alliance in this critical population, further study is warranted. More specifically, a number of questions have not been adequately addressed in the literature. Do treatment differences exist in the formation of early working alliance, in line with differential emphasis on supportive versus exploratory techniques? Is working alliance predictive of treatment retention/termination in this population? Is working alliance predictive of treatment outcome in this population?

Treatment Differences in Alliance

The role of alliance has been widely discussed in the theoretical literature on the treatment of BPD; however, few studies have systematically investigated whether differences exist across treatments of BPD in the type and degree of alliance. Three studies are relevant to this question; however, each of them suffers from significant limitations. In the only existing study investigating disparities in alliance across treatments for BPD, Arntz and colleagues (Spinhoven et al., 2007) found that patient and therapist reported working alliance was higher in Schema Focused Therapy than in TFP. A number of important limitations, most notably poor therapist adherence and competence in TFP, preclude the drawing of substantive conclusions based on this single study (Yeomans, 2006). Furthermore, few rigorous studies have examined treatment specific predictors of alliance in BPD. While it is important to know if there are differences between treatments, it is also essential to understand what techniques predict such differences. For example, it is unknown whether or not differential focus on

supportive and validating versus exploratory techniques is predictive of variation in alliance in this population (Foreman & Marmar, 1985; Gabbard, 1988; Gabbard et al., 1994). Gabbard and colleagues described an intensive methodology designed to study shifts in alliance in response to therapist interventions (Gabbard, 1988). The application of this methodology to a single case demonstrated an increase in collaboration following transference focused interventions on the part of the therapist. Strengths of this study include a well elaborated theoretical rationale for the hypotheses and the use of multiple coders for each session's intervention and alliance ratings. Limitations in this study include a non-standard definition of alliance (mostly focusing on collaboration) and the use of a case-study approach (i.e., N=1). Foreman & Marmar (1985) investigated the impact of specific therapist interventions on moment to moment fluctuations in alliance. The most consistent finding was that alliance improved in cases where the therapist focused specifically on the defenses the patient used to deal with feelings in relation to the therapist and others. Foreman and Marmar's use of a well operationalized measure of alliance and observer ratings from multiple coders for each session were marked strengths of this study. However, the small sample size (N=6) and non-standardization of treatment delivery limits the generalizability of the findings to the broader population.

In order to sufficiently determine whether alliance systematically varies as a function of treatment type, a number of methodological shortcomings of previous research must be addressed. Although these research parameters may be taken for granted, they have not been well adhered to in previous research and are therefore worthy of mention. First, manualized treatments must be considered as the object of investigation. Second, competence and adherence to treatment protocols must be

investigated in order to rule out these variables as confounds for alliance. Third, well standardized measures of alliance, such as the WAI, CALPAS (Marmar, 1989), VPPS (Strupp, 1984) or Haq (Luborsky, 1985), should be utilized and non-validated measures avoided. Fourth, well characterized and representative samples of the target population must be investigated to maximize the internal and external validity of findings (Miklowitz & Clarkin, 1999). This type of sample would include individuals who have been rigorously assessed and demonstrate appropriate heterogeneity of symptoms and presentations to be representative of a broader population of individuals with BPD. In addition, sufficient sample size is critical in order to maximize generalizability of results. Lastly, a priori hypotheses should be developed consistent with the theoretical underpinnings of each treatment. For example, the explicit focus of DBT and SPT on fostering positive elements of the relationship and minimizing conflict early in treatment would lead to a hypothesis of relatively high early alliance. In contrast, Kernberg's (1976) recommendation that negative elements of alliance be directly addressed early in treatment would lead to a hypothesis of lower early alliance as a means of stabilizing and strengthening the relationship in the long run.

Prediction and Prevention of Early Termination in BPD

Early treatment termination is a prevalent problem in the treatment of BPD (Bongar, Peterson, Golann, & Hardiman, 1990b). Early studies of naturalistic and controlled treatments of BPD indicated rates of dropout as high as 40-60% (Goldberg et al., 1986; Gunderson, Frank, Ronningstam, et al., 1989; Skodol et al., 1983; Waldinger & Gunderson, 1984). Although recently, rigorously controlled studies have reported considerably lower rates, (Bateman & Fonagy, 1999; Clarkin, Levy, Lenzenweger, and

Kernberg, 2007; Giesen-Bloo et al., 2006; Linehan et al., 1991; Stevenson & Mearns, 1992) dropout continues to represent an important barrier to (adequate) treatment delivery (Harley et al., 2007). Few studies have investigated predictors of dropout, either at the level of treatment type (Giesen-Bloo et al., 2006; Linehan et al., 2006) or contextual variables (such as alliance) that may be partially under the therapists' control (Gunderson et al., 1989; Spinhoven et al., 2007; Yeomans et al., 1994). As such, understanding factors associated with treatment termination and retention is critical to improved clinical outcomes.

With respect to treatment type as a predictor of outcome, Linehan and colleagues (Linehan et al., 2006) compared DBT to TAU and showed lower dropout in DBT. Arntz and colleagues (Giesen-Bloo et al., 2006) showed lower dropout in SFT than TFP. Gunderson and colleagues first considered the role of alliance in the prediction of early termination (1989). They conducted t-tests of both patient and therapist rated alliance (as assessed by the Haq) at six weeks to differentiate dropouts from continuers. A significant effect was found in the levels of alliance across these two groups. While an important preliminary finding, treatments within this study were not standardized and the use of t-tests failed to take into account the duration until dropout as a relevant variable. Yeomans and colleagues (Yeomans et al., 1994), demonstrated that therapist understanding and therapist involvement (subscales of the CALPAS) were positively related to the length of treatment in 36 patients with BPD. While this study represented an improvement over previous studies in its attention to the longitudinal nature of termination, its use of a single rater leaves open the question of reliability of alliance assessments. Most recently, Arntz and colleagues (Spinhoven et al., 2007) found that both patient and therapist

reported early alliance (WAI) was negatively related to premature termination. An important shortcoming of this study was that early alliance was not assessed until three months into treatment, making it impossible to determine the impact of alliance on very early dropouts (within 3 months). In fact, over half of the dropouts in the TFP condition never completed an alliance rating, and the therapist ratings for these patients were conducted retrospectively (after the dropout had occurred) leading to potentially biased results. Taken together, these findings suggest that alliance may play an important role in predicting early treatment termination. In order to more definitively address this relationship, future studies must simultaneously address a number of previously encountered shortcomings. First, well standardized treatments and measures must be employed. Second, methodologies that take advantage of the longitudinal nature of termination data should be utilized. Third, in order to minimize potential bias associated with knowledge of treatment status (dropout vs. continuer) prospective or observer rated measures of alliance can be used. In addition, the use of observer ratings of alliance, rather than patient and therapist report, increases the consistency of item use, thus minimizing variability due to differential understanding or desirability of items across individuals (patients or therapists). Lastly, because numerous studies have shown that termination frequently occurs within the first three months of treatment (Giesen-Bloo et al., 2006; Stevenson & Meares, 1992), assessment of alliance must be conducted beginning very early in treatment (perhaps as early as the first 5 sessions), in order to obtain information about this variable when it is likely to be asserting the greatest influence.

Alliance as a Predictor of Outcome in BPD

Beyond the relationship between alliance and treatment retention, a broader question may be asked: Is alliance predictive of treatment outcome in this population and how can this relationship best be modeled? Given the intense and chaotic interpersonal patterns characteristic of this population, understanding how an interpersonal feature of treatment is related to outcome is critical. With respect to this substantive question, no peer reviewed articles exist documenting a relationship between alliance and outcome directly. In the only existing study of working alliance and outcome in BPD, Arntz and colleagues found a no relationship between therapist and patient rated working alliance at three months of treatments and clinical improvement over the course of treatment (Spinhoven et al., 2007). The dearth of literature in this area clearly indicates the need for further investigation.

In order to address this relationship, future studies should take advantage of the most current approaches to outcome modeling and should incorporate broadly the lessons learned from process research. As described with respect to investigation treatment retention, well standardized treatments and measures must be employed. In addition, in order to minimize potential bias associated with knowledge of treatment response, prospective or observer rated measures of alliance can be used. Finally, methodologies that take advantage of the longitudinal nature of outcome data should be utilized. Hierarchical linear modeling provides the most accurate estimates of treatment effects and accounts for non-independence of observations within a nested data structure (Raudenbush and Bryk, 2002; Snijders and Bosker, 1999). Further, using this type of approach allows the researcher to ask questions relating to both individual and group

differences at a given point in time as well as individuals differences in treatment response (i.e. rate of symptom change over time).

Aims and Hypotheses of the Present Study

The primary aim of the proposed research is to understand a proposed mechanism of change in psychotherapy for Borderline Personality Disorder (BPD) through examination of the relationship between alliance and outcome in two well established treatments for BPD. BPD is costly, painful, debilitating, and deadly, and thus, represents a serious clinical and public health concern. Across multiple studies of Axis I psychopathology, alliance has been shown to be a robust predictor of outcome. In addition, formation of an alliance has been written about extensively in theoretical descriptions of the treatment of BPD. However, little systematic research has been conducted to determine the relationship between alliance and outcome in BPD. The maximization of efficacy in the treatment of BPD depends upon understanding the specific mechanisms that characterize the disorder and that determine clinical change. Here, we examined working alliance in BPD, with a well standardized observer-rated measure (WAI) and a well characterized and representative sample of reliably diagnosed patients. We used archival data from a randomized clinical trial, including well characterized and standardized treatments to minimize competence as a confound for alliance. Through direct investigation of the alliance in a well controlled study of treatments for BPD, we begin to answer important questions regarding the role of alliance in therapeutic change with this population. The *long-term goal* of this research program is to elucidate the technical, relational, and contextual mechanisms of change in the treatment of specific psychological disorders, and to facilitate the translation of these

findings into the validation and dissemination of efficacious treatments. Three foundational questions regarding the alliance in BPD were posed: 1) do treatment differences exist in the formation of early alliance, in line with emphasis on supportive and validating techniques early in treatment? 2) is alliance predictive of treatment retention/termination in this population? And 3) is alliance predictive of treatment response in BPD? The *central hypothesis* for this study was that alliance would be predictive of both retention and outcome in a well-controlled trial of multiple treatments for BPD. Analysis of variance, survival analysis and hierarchical linear models were used to address the following aims:

Aim 1: To test the hypothesis that treatment differences exist in the formation of working alliance in patients with BPD. We predicted that global working alliance would be higher in individuals treated with DBT and SPT than with TFP.

Aim 2: To test the hypothesis that working alliance is predictive of dropout in an RCT of three treatments for BPD. We predicted that working alliance would predict early treatment termination, such that lower alliance will be associated with early termination and higher alliance will be associated with treatment retention.

Aim 3: To test the hypothesis that working alliance is related to initial functional impairment and predictive of treatment response. In a series of hierarchical linear models accounting for the longitudinal nature of the outcome data, we predicted that working alliance would be related to pre-treatment indicators of interpersonal functioning and would predict rate of change in symptoms and functioning over time.

Chapter 2

METHOD

Design

The goal of the proposed study was to investigate the role of working alliance in the treatment of Borderline Personality Disorder. Using archival data, we assessed working alliance across multiple psychotherapy sessions for each patient within an RCT investigating the relative efficacy of Transference Focused Psychotherapy (TFP), Dialectical Behavior Therapy (DBT), and Supportive Psychotherapy (SPT). Three raters were trained in the use of the Working Alliance Inventory–Observer Form. The raters are three advanced clinical psychology doctoral students with at least two years of psychotherapy experience, including the treatment of Borderline Personality Disorder. Raters were trained in a group format for 2 hours per week over a 4-month period to reach adequate pre-study reliability (an intraclass correlation coefficient $> .70$). Training consisted of didactic instruction and discussion of the instrument, trainer and peer review of multiple sessions and patients, and coding exercises designed to test and expand understanding of each scale item. For the duration of the psychotherapy coding phase of the study, raters reconvened on a weekly basis for supportive training and to prevent rater drift. Two sessions from each of the ninety patients' psychotherapies were by all three coders and averages across all three coders were used in subsequent analyses. Sessions were selected to maximize the data available and to best answer the questions under investigation. Whenever possible, sessions five and seven were rated for alliance. For patients who terminated before the seventh session, two non-consecutive earlier sessions were selected (e.g., 3 and 5, not 4 and 5, if only 5 sessions were available) to minimize

autocorrelations within the data. Patient alliance scores were calculated as the mean across the two sessions.

Participants

Patients with BPD were recruited between November 1999 and July 2002 from a 50 mile radius of New York City. Patients were referred by private practitioners, clinics, family members and self, although 97% were referred by mental health professionals. Participants were 90 adults (6 men and 84 women) between the ages of 18 and 50 ($M=33.9$). The sample was predominantly Caucasian (63%), unmarried (43% single, 37% separated or divorced), and educated (52% completed college). Patients with comorbid schizophrenia, schizoaffective disorder, bipolar I disorder, delusional disorder, and/or delirium, dementia, and amnesia and other cognitive disorders were excluded because of the influence of brain pathology and thought disorder on the ability to provide meaningful self-report data and complicated response to treatment. At the time that participants were invited to participate in the study, written informed consent was obtained after all study procedures had been explained, including agreement to have all assessments and psychotherapy sessions videotaped.

Of the 207 individuals clinically referred and interviewed for at least one evaluation session, 109 were eligible for randomization. Of the 109 eligible for randomization, 90 (83%) were randomized to treatment. There were no differences in terms of demographics, diagnostic data, and severity of psychopathology between those randomized to treatment and those not. The participants were randomized to one of the three treatment conditions for a no cost 1-year outpatient treatment: DBT, TFP, and SPT. Participants underwent 50 weeks of psychotherapy over the course of up to 13.5 months.

DBT involved one weekly 60 minute individual session and one weekly 2-hour group session. TFP involved twice-weekly 45 minute individual sessions. SPT involved one 50 minute session per week with the option of an additional session if clinically indicated. Each of the three therapy conditions were supervised by treatment condition leaders who are experts in their respective modality. Therapists were selected by the treatment condition leaders based on prior demonstration of competence in the treatment of BPD with that modality. All therapists brought videotape of their therapy sessions to a weekly supervision during which leaders rated therapists for adherence and competence and feedback was delivered (see Clarkin et al., 2007 and Levy et al., 2006 for further description of treatment conditions and monitoring of therapists).

Outcome Assessments

Following an initial screening, individuals were assessed by trained evaluators prior to assignment to treatment. Each participant who received a diagnosis of BPD based on DSM-IV (APA) criteria as assessed by the International Personality Disorders Examination (Loranger, Sartorius, Andreoli, & Berger, 1994) and who did not meet any of the exclusion criteria based on the Structured Clinical Interview for DSM-IV (First, Gibbon, Spitzer, & Williams, 1997) were randomized to treatment. High levels of reliability were obtained for the number of BPD criteria met (single rater ICC [1,1]=.83). An acceptable level of reliability for BPD diagnosis was obtained (kappa=.64; Critchfield, Levy & Clarkin, 2007). A priori, suicidality, aggression, and impulsivity were chosen as primary outcome domains and anxiety, depression, and social adjustment as secondary outcome domains. These variables were assessed at baseline and at 4, 8, and

12 months. Domains in which significant changes were observed in the primary RCT (Clarkin et al, 2007) were selected for use in the present study.

Measures

Psychotherapy Rating Measures

Working Alliance Inventory–Observer Version (WAI-O; Horvath & Greenberg, 1989) is designed to capture Bordin's (1979) definition of the working alliance. This 36-item instrument consists of three subscales: The Goal subscale addresses the extent to which therapy goals are mutual, important, and feasible. The Task subscale focuses on the agreement between patient and therapist with respect to the steps that need to be taken in order to improve the client's situation. Lastly, the Bond subscale measures attachment, mutual liking, and respect. Multiple studies of the WAI-O have demonstrated high internal consistency ($\alpha=.93$; Horvath & Greenberg, 1989), predictive validity (Busseri & Tyler, 2003; Erdur, Rude, Baron, Draper, & Shankar, 2000), and inter-rater reliability (ICC=.92 in Tichenor & Hill, (1989); average ICC=.82 in Horvath & Symonds, (1991)). 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. In a more recent study, Fenton and colleagues (2001) found the observer version of the WAI was more predictive than either patient or therapist ratings. Among observer rated alliance measures investigated in their study, they suggest that measures should be selected for study use based upon consistency with previous research and theoretical concerns. Because in the proposed study it is important to the investigators to utilize an atheoretical measure of alliance, and one that provides data about agreement on tasks and goals, as well as the nature of the bond, the WAI is considered to be most appropriate.

The selection of an observer rated measure of alliance in the present proposal was based on a number of additional considerations. First, whenever patients and therapists provide self-reported data, there is the potential that items are being understood or scored differently by different people. By using an observer based measure, it is possible to ensure through training and inter-rater reliability analyses that items are being used consistently across all patient-therapist dyads. In this way, observer ratings provide data for which it is possible to empirically assess the level of reliability and determine an acceptable cut-off. By the conclusion of the training period for the present study, coders reached consistently high levels of reliability as evidenced by average Intra-class correlations of above .8. Second, the use of an observer rated measure minimizes any effects on reported alliance that might emerge as the result of the differential desirability of engaging in or reporting certain alliance related behaviors across treatments. Utilization of an external observer ensures that patient and therapist behaviors, rather than those behaviors valued by therapists, are the data being used to inform item responses. Finally, the use of an observer rated alliance measure allows for a fully crossed, rather than nested design. A crossed design, in which multiple individuals rate each patient-therapist dyad, allows for the examination of whether differences in scores are due to differences in the targets themselves, rather than in the individuals making the ratings (i.e., differential use of the measure by different patients or therapists).

Primary Outcome Measures

Overt Aggression Scale-Modified (OAS-M; Coccaro, Harvey, Kupshaw-Lawrence, Herbert, & Bernstein, 1991)). This interviewer rated scale consists of four component categories: aggression (self-directed), aggression (other-directed), irritability

and suicidality, and is based on the patient's verbal reports to specific prompts regarding their behavior during the past week and month. Items within each category are scored based upon severity and frequency and then summed. The summed scores for the category are then multiplied by the weight for that category, such that some categories are more heavily weighted than others (e.g., suicidality is more severe than irritability). Both the total OAS-M score and the suicidality sub-category were considered as primary outcomes for the present study. Previous studies have shown high levels of inter rater reliability between raters (ICC=.96) and between raters and an expert rater (ICC=.98; Endicott, Tracy, Burt, Olson & Coccaro, 2002).

Secondary Outcome Measures

The Global Assessment of Functioning Scale (GAF; APA, 2000)). The GAF provides a single global rating of functioning and symptomatology. Scores range from 1 (e.g., needs constant supervision, serious suicide act with clear intent and expectation of death) to 100 (e.g., superior functioning in a wide range of activities, no symptoms) and are based on clinical judgment of assessor following each assessment. The GAF was included as a global assessment of patient improvement (or deterioration) over time, as assessed by an external observer. In multiple studies, the GAF has been shown to have good inter-rater reliability (Edson, Lavori, Tracy & Adler, 1997; First, Gibbon, Spitzer & Williams, 1996; Soderberg, Tungstrom, Armelius, 2005).

Social Adjustment Scale – Self Report (SAS-SR; Weissman & Bothwell, 1976).

The SAS-SR is a 54-item self-report measure of functioning across a range of social domains over the past two weeks. It includes questions on work (both paid and unpaid, and as a student); social and leisure activities; relationship with extended and immediate

family; and perception of economic functioning. Questions are aimed at performance, conflict, feelings, and satisfaction within each domain. Items are scored on a 5-point scale with higher scores indicating poorer functioning. The SAS-SR has been found to have high levels of agreement between patient and spouse ratings (Weissman & Prusoff; 1978), high internal consistency ($r=.74$) and test-retest reliability ($r=.80$; Edwards, Yarvis, Mueller, et al., 1978), and is sensitive to symptom change (Weissman & Bothwell, 1976; Dunner, Gerard & Fieve, 1977).

Brief Symptom Inventory (BSI; Derogatis, 1983)). The BSI is the short form (53 items) of the Symptom Checklist-90-R (SCL-90-R) and measures nine domains of distress and symptomatology, including measures of depression, anxiety, hostility, somatization, and psychosis using a 5-point Likert scale. The BSI yields three global indices of distress: the Global Severity Index (GSI; the grand total/53), the Positive Symptom Total (PST; number of symptoms rated 1 or higher), and the Positive Symptom Distress Index (PSDI; grand total/PST). Derogatis and Melisaratos (1983) report high test retest reliability (GSI=.90) and internal consistency (range of α for individual domains .71 to .85).

Beck Depression Inventory (BDI; Beck, Ward, Mendelson, Mock, & Erbaugh, 1961). The BDI is a 21-item scale which measures severity of depression. Each item is rated on a 4-point scale (0-3) to describe psychological, somatic, and vegetative symptoms of depression. Summary scores range from 0 to 63, and subjects are considered depressed if they scored above 21. Previous studies have demonstrated good test-retest reliability (Miller & Seligman, 1973) and split-half reliability ranging from

adequate to excellent (Beck, Steer & Garbin, 1988; Beck et al., 1961; Weckowicz, Muir & Cropely, 1967)

Data Analytic Method

Specific Aim 1: To test the hypothesis that treatment differences exist in the formation of working alliance in patients with BPD.

To test the hypothesis that working alliance is higher in individuals treated with Supportive Psychotherapy and Dialectical Behavior Therapy than in those treated with Transference Focused Psychotherapy, a one-way between groups Analysis of Variance (ANOVA) was conducted. In an exploratory fashion, we also tested whether treatment differences exist with respect to the three subscales of the WAI (Bond, Tasks, and Goals) using Multivariate Analysis of Variance (MANOVA).

Specific Aim 2: To test the hypothesis that alliance is predictive of early dropout in a randomized clinical trial of three treatments for BPD.

To test the hypothesis that working alliance is predictive of early treatment termination survival analysis were utilized. Survival analysis was selected, as opposed to ANOVA or Ordinary Least Squares (OLS) regression, because it is the most appropriate method for analyzing the duration until particular events of interest (in this case early treatment termination) and most fully takes advantage of data involving longitudinal processes. Within survival analysis, the primary parameter of interest is the hazard rate. The hazard rate represents the chance or risk “that an event will occur at a particular time to a particular individual, given that it has not yet occurred at any point in time” (Allison, 1984). The baseline hazard rate was estimated before covariates were entered into the model. Treatment condition was entered as the first covariate in the model, followed by

Working Alliance. For treatment conditions a log-rank test of equality across groups (a non-parametric test) was used. For working alliance (a continuous variable), a uni-variate Cox proportional hazard regression was used (a semi-parametric test). Finally, an interaction term between Treatment Condition and Working Alliance was entered into the model to test whether differences in working alliance predict early termination in the same way across treatment conditions.

Specific Aim 3: To test the hypothesis that working alliance is related to initial functional impairment and predictive of treatment response.

Multi-level models (Raudenbush & Bryk, 2002; Snijders & Bosker, 1999) were used to address this research aim. Multi-level models are well suited to address this question for a number of reasons: 1) they are able to account for the nested nature of this study's data, 2) they are robust to unequal sample size and data missingness, and 3) they allow for the modeling of unequal time between measurement occasions. Linear mixed models were estimated *for each of the primary and secondary outcome variables* using SAS PROC MIXED in order to pattern of symptom change over time. Restricted maximum likelihood (REML) was used to report model parameters while significance tests (based on p-values) were used to assess incremental improvements to the model. Degrees of freedom were estimated with the Satterthwaite method. Ninety-five percent confidence intervals (CI's) for random variation around fixed effects were calculated as two standard deviations of the associated random variance terms above or below the mean value. Assessment occasion was centered at the start of treatment and reported using months as the metric of time. As such, the intercept represented initial status in all models. After determining an unconditional model of change (in which both linear and

quadratic models were tested), treatment condition and working alliance were considered as predictors. The relationship between alliance and initial symptom severity and functional impairment was investigated through the main effect of alliance in each model. The relationship between alliance and treatment response (change over time) was investigated through the interaction of alliance with time in each model. Alliance was centered at 5, the grand mean for the sample. A WAI score of 5 indicates a generally positive alliance.

Chapter 3

RESULTS

Preliminary and Descriptive Analyses

Intraclass correlation coefficients (ICCs) were calculated to demonstrate inter-rater reliability on the WAI. For the WAI total score the average ICC was .906, indicating a high degree of reliability at the level of the entire measure. Item level ICCs were also conducted to determine the degree of reliability across raters at the level of individual items. The average ICC across all of the items was .720, with a median of .764, suggesting adequate reliability at the item level in addition to the aggregate total score level. Tests of normality on the alliance ratings indicated normal degree of skew and kurtosis; therefore, no data transformations were performed. Aggregated across sessions and raters the average level of alliance was 4.99 (SD=0.45). The average at the first session rated (session 5) was 4.95 (SD=0.55), while the average at the second session rated (session 7) was 5.05 (SD=0.47). Session 5 and 7 ratings of alliance were correlated $r=.527$, $p<.001$. The average Bond subscale score was 5.21 (SD=.33); the average Task subscale score was 5.16 (SD=.49); and the average Goal subscale score was 4.60 (SD=.59). Means, standard deviations, and ranges for the WAI total score and subscale scores are reported in Table 1. The three subscales were highly correlated with one another; with all correlations above .8 (see Table 2), suggesting a high degree of overlap among subscales. Preliminary analyses suggest that there alliance was generally positive and only small differences between subscales exist.

Specific Aim 1: Between Group Differences in Alliance

The first study aim was to determine whether differences existed in the level of alliance observed across treatment conditions. It was predicted that if differences existed that individuals treated with Supportive Psychotherapy and Dialectical Behavior Therapy would have higher overall alliance than in those treated with Transference Focused Psychotherapy. In order to test this hypothesis, a one-way between groups Analysis of Variance (ANOVA) was conducted. Data was inspected for normality, homogeneity of variance and outliers before analyses were conducted; no violations of the assumptions required for this ANOVA were found. No main effect was observed for treatment condition ($F(2, 85) = 0.18, p=ns$). Means and standard deviations for the WAI total score and subscale scores across Treatment Conditions are reported in Table 3. Overall Alliance was rated as highest in SPT ($M=5.02, SD=0.45$), followed by DBT ($M=4.99, SD=0.44$) then TFP ($M=4.96, SD=0.49$). Planned post hoc comparisons were not considered because the omnibus test was not significant. There are no treatment level differences in overall alliance.

Next a Multivariate Analysis of Variance (MANOVA) was conducted to test whether treatment differences exist with respect to the three WAI subscales (Bond, Task, Goals). The Wilk's Lambda multivariate test of overall differences among groups was not statistically significant ($F(3,83)=1.69, p=ns$). Univariate between-subjects tests showed that treatment condition was not significantly related to Bond (partial eta-squared=0.032, $p=ns$), Task (partial eta-squared<0.001, $p=ns$) or Goals (partial eta-squared=0.003, $p=ns$). Post-hoc comparisons were not conducted because omnibus tests were non-significant. Subsequent aims will only consider the global working alliance

score, as there was no evidence of group differences in subscales and subscales were found to be highly correlated.

Specific Aim 2: Alliance as a Predictor of Dropout

To test the hypothesis that working alliance is predictive of early treatment termination survival analysis was used. It was hypothesized that lower levels of alliance would be associated with early termination and that higher alliance would be associated with treatment retention. The baseline hazard rate was calculated first; it represents the overall conditional probability of early termination in the entire sample. The cumulative hazard rate was 34.1%. The cumulative hazard rate represents the percentage of the population exposed to risk for which the target event (in this case, early treatment termination) occurs. The hazard rate in any given month ranged from 0% to 9% with highest rates in months 2 (hazard rate=0.07, SE=.03) and 6 (hazard rate=0.09, SE=.04). Next, the impact of treatment condition (i.e. assignment to TFP, DBT, or SPT) was considered. Inspection of the Kaplan-Meier curves for treatment condition demonstrated a pattern of non-proportional hazards (see Figure 1). When the assumption of proportional hazards is met, the survival curves do not cross, rather they remain parallel at all time points. When the assumption of proportionality is not met, the variable of interest should be considered as a stratum rather than as a covariate in subsequent models. In order to determine whether differences exist with respect to survival, a Life Tables test was conducted with treatment condition as a stratum. The Wilcoxon Gehan Statistic tests the homogeneity of survival function across treatment conditions. The rank test for homogeneity indicates a trend level difference between the treatments (Wilcoxon Statistic=5.2, df=2, $p<.073$). Pairwise comparisons reveal that there was a significantly

higher risk of dropout in DBT (51.7%) than in either TFP (23.3%) or SPT (27.6%); Wilcoxon statistic=3.87, $df=1$, $p<.05$ for TFP vs. DBT; Wilcoxon Statistic=3.35, $df=1$, $p<.067$ for SPT vs. DBT).

In order to determine whether working alliance is predictive of early termination a cox proportional hazard regression model was used. Treatment condition was entered as a stratum in this model and Working Alliance as a covariate. The chi-square test indicates that the model is significant overall (chi-square=4.74, $df=1$, $p<.03$) and that inclusion of working alliance as a covariate significantly improves model fit (chi-square difference=4.50, $df=1$, $p<.034$). Working alliance is found to have a significant negative relationship to early termination (beta=-.835, SE=0.386, $df=1$, $p<.03$, Exp(B)=.434, 90% CI for Exp(B)=.204-.924). Finally, an interaction term between Treatment Condition and Working Alliance was considered for inclusion into the model. Because Treatment Condition demonstrated non-proportional hazards and was not included as a covariate, rather as a stratum, the interaction term for Treatment Condition and Working Alliance cannot separate the main effects of Treatment Condition from the interactive effects of Treatment Condition with Working Alliance. The chi-square test indicates that inclusion of this interaction term does not improve model fit (chi-square difference=0.02, $df=2$, $p=ns$) and should be removed. Given the probable impact of low power on the previous model, the interaction between Treatment Condition and Working Alliance was explored further through the use of a median split on the working alliance variable (in contrast to its previous use as a continuous predictor). Frequencies of dropout for each treatment condition, when working alliance was either above or below the mean were determined (see Table 4). In TFP, 25% of patients dropped out when alliance was below the mean,

while 21.4% dropped out when alliance was above the mean; a 3.6% difference. In SPT, 33.3% of patients dropped out when alliance was below the mean, while 23.5% dropped out when alliance was above the mean; a 9.8% difference. In DBT, 71.4% of patients dropped out when alliance was below the mean, while 33.3% dropped out when alliance was above the mean; a 38.1% difference. Without a statistical test, no significance value can be determined; however, it is noteworthy that a very large difference in the frequency of dropout was observed in DBT, while smaller differences were observed in the other two treatments.

Specific Aim 3: Alliance as a Predictor of Outcome

Suicidality

Polynomial models were first specified with a random intercept only. The intraclass correlation for the unconditional means model for suicidality was .28, indicating that nearly 70% of the variance in suicidality across assessments occurred within persons. A fixed linear effect was significant ($p < .001$), such that average suicidality declined as a function of time in treatment. The inclusion of a random linear effect resulted in a significant improvement of the model, REML deviance difference (2) = 4.2, $p < .05$. The magnitude of this linear decrease was marginally reduced in later months, as indicated by a quadratic effect of time, $p < .08$. The inclusion of a random quadratic effect did not result in a significant improvement in model fit, REML deviance difference (3) = -2.2, $p < ns$. The mean level of suicidality at the start of treatment (Month 0) was 1.30, with a 95% CI of 1.0 to 1.6. The mean instantaneous rate of change at the start of treatment was -0.13 points per month, with a 95% CI of -0.23 to -0.04, indicating that all participants demonstrated initial improvements in suicidality. The mean

deceleration in rate of change was 0.007 points per month, with a 95% CI of -0.001 to 0.02, indicating that not all participants experienced a slowing in rate of change over the course of treatment.

The unconditional growth model was used as a baseline for determining whether the inclusion of subsequent predictors was warranted. It was predicted that working alliance would be unrelated to initial level of suicidality but that it would be related to changes in suicidality during the course of treatment. As predicted, working alliance was not related to initial level of suicidality ($p=ns$). Counter to prediction, there was no significant interaction of working alliance with the linear effect of time ($p=.68$). The absence of an interaction of working alliance with time indicates that the working alliance is likely not a moderator of treatment response, with respect to suicidality. Treatment group was not found to predict either initial severity of suicidality ($p<.11$) or change in suicidality over time ($p=.33$). The model of best fit with respect to suicidality is the unconditional growth model.

Aggression

Polynomial models were first specified with a random intercept only. The intraclass correlation for the unconditional means model for aggression was .297, indicating that nearly 70% of the variance in suicidality across assessments occurred within persons. A fixed linear effect was significant ($p<.002$), such that average aggression declined as a function of time in treatment. The inclusion of a random linear effect resulted in a significant improvement of the model, REML deviance difference (2) = 22.8, $p <.05$. The magnitude of this linear decrease was reduced in later months, as indicated by a significant quadratic effect of time, $p<.005$. The addition of a random

quadratic effect also resulted in a significant improvement in model fit, REML deviance difference (3) = 30.2, $p < .05$. The mean level of aggression at the start of treatment (Month 0) was 22.02, with a 95% CI of 16.2 to 27.9. The mean instantaneous rate of change at the start of treatment was -2.61 points per month, with a 95% CI of -4.3 to -0.87, indicating that all participants demonstrated improvement during the course of treatment. The mean deceleration in rate of change was .16 points per month, with a 95% CI of 0.01 to 0.30, indicating that all participants demonstrated a change in rate of improvement over the course of treatment.

The unconditional growth model was used as a baseline for determining whether the inclusion of subsequent predictors was warranted. It was predicted that working alliance would be unrelated to initial level of aggression but that it would be related to changes in aggression during the course of treatment. As predicted, working alliance was not related to initial level of suicidality ($p = .68$). Counter to prediction, there was no significant interaction of working alliance with the linear effect of time ($p = .29$). The absence of an interaction of working alliance with time indicates that the working alliance is likely not a moderator of treatment response, with respect to aggression. Treatment group was not found to predict either initial severity of aggression ($p < .32$) or change in aggression over time ($p = .31$). The model of best fit with respect to aggression is the unconditional growth model.

Global Assessment of Functioning (GAF)

Polynomial models were first specified with a random intercept only. The intraclass correlation for the unconditional means model for GAF was .532, indicating that a little less than half of the variance in global functioning across assessments

occurred within persons. A fixed linear effect was significant ($p < .001$), such that average GAF increased as a function of time in treatment. The inclusion of a random linear effect resulted in a significant improvement of the model, REML deviance difference (2) = 9.4, $p < .05$. The magnitude of this linear decrease was reduced in later months, as indicated by a significant quadratic effect of time, $p < .005$. The inclusion of a random quadratic effect did not result in a significant improvement in model fit, REML deviance difference (3) = 2.7, $p < ns$. The mean GAF at the start of treatment (Month 0) was 49.94, with a 95% CI of 47.9 to 52. The mean instantaneous rate of change at the start of treatment was 1.7 points per month, with a 95% CI 1.14 to 2.27, indicating that all participants demonstrated initial improvement in functioning. The mean deceleration in rate of change was .08 points per month, with a 95% CI of -0.13 to -0.04, indicating that all participants experienced a slowing in rate of change over the course of treatment.

The unconditional growth model was used as a baseline for determining whether the inclusion of subsequent predictors was warranted. It was predicted that working alliance would be related to initial GAF as well as changes in GAF during the course of treatment. As predicted, working alliance was related to initial GAF ($p < .002$). Counter to prediction, there was no significant interaction of working alliance with the linear effect of time ($p = .18$). Treatment group was not found to predict either initial GAF ($p < .30$) or change in GAF over time ($p = .84$). When the interactive effect of treatment group and working alliance on change over time was modeled a trend was found ($p < .09$), such that working alliance was related to significant improvements over time in TFP and DBT treatments, but was unrelated to change in GAF over time in SPT. The model parameters for the conditional growth model for GAF are given in Table 5 and includes the main

effect of working alliance, the interaction of working alliance with time, and a three way interaction of working alliance, time and treatment condition. The interaction of working alliance with time is retained in the model, despite being non-significant for ease of interpretation and in order to provide significance tests for the difference between groups. As shown, the mean GAF at the start of treatment was 49.9, with a 95% CI of 47.9 to 51.9. The mean instantaneous rate of change at the start of treatment was 1.7 points per month, with a 95% CI of 1.13 to 2.27, indicating that all participants demonstrated initial improvements. The mean deceleration in rate of change was -.08 points per month, with a 95% CI of -0.13 to -0.04, indicating that all participants demonstrated a deceleration in rate of improvement over the course of treatment. The main effect of working alliance on GAF was 5.15, indicating that for every point of working alliance above the mean ($M=5$) a positive deviation of more than 5 points of GAF could be expected at the initial assessment. The interaction of alliance with time (-.49) was not significant. In the present model this interaction represents the effect of alliance on change in GAF over time for those individuals being treated with SPT. The three way interaction of working alliance, treatment group and time was marginally significant ($p<.09$) and indicates that for those individuals treated with TFP alliance is related to increases in GAF over time at a significantly greater level than for those individuals treated with SPT (1.12, $p<.05$). For those individuals treated with DBT, alliance is also related to increases in GAF over time; this effect is marginally greater than for those individuals treated with SPT (1.17, $p<.06$). This interaction provides preliminary evidence that treatment condition may moderate the effect of alliance on change in GAF. This trend can be seen in Figure 2.

Social Adjustment (SAS)

Polynomial models were first specified with a random intercept only. The intraclass correlation for the unconditional means model for SAS was .42, indicating that nearly 60% of the variance in social adjustment across assessments occurred within persons. A fixed linear effect was significant ($p < .001$), such that average social adjustment improved as a function of time in treatment. The inclusion of a random linear effect resulted in a significant improvement of the model, REML deviance difference (2) = 6.1, $p < .05$. The magnitude of this linear effect was reduced in later months, as indicated by a quadratic effect of time, $p < .001$. The inclusion of a random quadratic effect did not result in a significant improvement in model fit, REML deviance difference (3) = 0.2, $p < ns$. The mean level of SAS at the start of treatment (Month 0) was 4.9, with a 95% CI of 4.7 to 5.16. The mean instantaneous rate of change at the start of treatment was -0.20 points per month, with a 95% CI of -0.28 to -0.13, indicating that all participants demonstrated initial improvements in social adjustment. The mean deceleration in rate of change was 0.01 points per month, with a 95% CI of 0.004 to 0.016, indicating that all participants experienced a slowing in rate of change over the course of treatment.

The unconditional growth model was used as a baseline for determining whether the inclusion of subsequent predictors was warranted. It was predicted that working alliance would be related to both initial level of social adjustment and changes in social adjustment during the course of treatment. As predicted, working alliance was significantly related to initial level of suicidality ($p < .02$). Counter to prediction, the interaction of working alliance with the linear effect of time was not significant ($p = .22$).

The absence of an interaction of working alliance with time indicates that the working alliance is likely not a moderator of treatment response, with respect to social adjustment. Treatment group was found to predict initial level of social adjustment ($p < .01$), indicating a failure of randomization with respect to this variable. Patients in TFP were found to have significantly better social adjustment than those in SPT ($p < .01$). Treatment condition was not related to change over time ($p < .15$). The model parameters for the conditional growth model for SAS are given in Table 6 and include the main effects of working alliance and treatment condition. As shown, the mean SAS at the start of treatment for individuals in SPT was 5.24, with a 95% CI of 4.9 to 5.59. The mean instantaneous rate of change at the start of treatment was -0.20 points per month, with a 95% CI of -0.27 to -0.12, indicating that all participants demonstrated initial improvements. The mean deceleration in rate of change was 0.01 points per month, with a 95% CI of 0.004 to 0.02, indicating that all participants demonstrated a deceleration in rate of improvement over the course of treatment. The main effect of working alliance on SAS was -0.55, indicating that for every point of working alliance above the mean ($M=5$) a negative deviation of more than .5 points of SAS could be expected at the initial assessment (note: higher scores represent greater impairment, so negative deviation indicates better functioning). The main effect of treatment condition was significant ($p < .01$) such that those individuals in TFP were predicted to have a deviation of -.63 points from the intercept estimate reflecting those in SPT; therefore the initial mean SAS at the start of treatment for those in TFP was 4.6. The initial mean SAS at the start of treatment for DBT was 4.95, which was not significantly different from those in SPT ($p < .21$).

Brief Symptom Inventory (BSI)

Polynomial models were first specified with a random intercept only. The intraclass correlation for the unconditional means model for BSI was .610, indicating that a little less than 40% of the variance in overall symptom severity across assessments occurred within persons. A fixed linear effect was significant ($p < .001$), such that average BSI decreased as a function of time in treatment. The inclusion of a random linear effect did not result in a significant improvement of the model, REML deviance difference (2) = 1.1, $p < ns$. The magnitude of this linear decrease was marginally reduced in later months, as indicated by a quadratic effect of time, $p < .08$. The inclusion of a random quadratic effect did not result in a significant improvement in model fit, REML deviance difference (3) = 0.1, $p < ns$. The mean BSI at the start of treatment (Month 0) was 96.8, with a 95% CI of 89.3 to 104.3. The mean instantaneous rate of change at the start of treatment was -3.97 points per month, with a 95% CI of -5.9 to -2.0, indicating that all participants demonstrated improvement during the course of treatment. The mean deceleration in rate of change was .14 points per month, with a 95% CI of -0.02 to 0.3, indicating that not all participants experienced a slowing in rate of change over the course of treatment.

The unconditional growth model was used as a baseline for determining whether the inclusion of subsequent predictors was warranted. It was predicted that working alliance would be unrelated to initial BSI but that it would be related to changes in BSI during the course of treatment. As predicted, working alliance was not related to initial BSI ($p = .82$). The interaction of working alliance with the linear effect of time was significant at a trend level ($p < .10$). Treatment group was not significantly related to initial BSI ($p < .12$) or change in BSI over time ($p = .61$). The model parameters for the

conditional growth model for BSI are given in Table 7 and include the main effect of working alliance and the interaction of working alliance with time. The main effect of working alliance is retained in the model, despite being non-significant because model fit worsened when this parameter was removed, REML deviance difference (2) = 6.3, $p < .05$. As shown, the mean BSI at the start of treatment was 96.8, with a 95% CI of 89.3 to 104.4. The mean instantaneous rate of change at the start of treatment was -3.9 points per month, with a 95% CI of -5.87 to -1.98 , indicating that all participants demonstrated improvements during the course of treatment. The mean deceleration in rate of change was $.14$ points per month, with a 95% CI of -0.02 to 0.3 , indicating that not all participants demonstrated a deceleration in rate of improvement over the course of treatment. The main effect of working alliance on BSI was 3.49 , indicating that for every point of working alliance above the mean ($M=5$) a positive deviation of approximately 3.5 points of GAF could be expected at the initial assessment; this effect was not significant. The interaction of alliance with time was -1.16 , indicating that for every point of working alliance above the mean and additional decrease of more than 1 BSI point could be expected for every month of treatment. This interaction provides preliminary evidence that treatment condition may moderate the effect of alliance on change in BSI. This trend can be seen in Figure 3.

Depression (BDI)

Polynomial models were first specified with a random intercept only. The intraclass correlation for the unconditional means model for aggression was $.04$, indicating that the vast majority (96%) of the variance in depression across assessments occurred within persons. A fixed linear effect was significant ($p < .001$), such that average

depression declined as a function of time in treatment. The inclusion of a random linear effect did not result in a significant improvement of the model, REML deviance difference (2) = 0.5, $p < ns$. The magnitude of this linear decrease was marginally reduced in later months, as indicated by a quadratic effect of time, $p < .097$. The inclusion of a random quadratic effect did not result in a significant improvement in model fit, REML deviance difference (3) = 4, $p < ns$. The mean level of depression at the start of treatment (Month 0) was 47.54, with a 95% CI of 45.05 to 50.02. The mean instantaneous rate of change at the start of treatment was -1.82 points per month, with a 95% CI of -2.9 to -0.74, indicating that all participants demonstrated initial improvement in BDI ratings. The mean deceleration in rate of change was .08 points per month, with a 95% CI of -0.01 to 0.17, indicating that not all participants demonstrated a change in rate of improvement over the course of treatment.

The unconditional growth model was used as a baseline for determining whether the inclusion of subsequent predictors was warranted. It was predicted that working alliance would be unrelated to initial level of depression but that it would be related to changes in depression during the course of treatment. As predicted, working alliance was not related to initial level of suicidality ($p = .75$). Counter to prediction, there was no significant interaction of working alliance with the linear effect of time ($p = .93$). The absence of an interaction of working alliance with time indicates that the working alliance is likely not a moderator of treatment response, with respect to depression. Treatment group was not found to predict either initial severity of depression ($p = .81$) or change in aggression over time ($p = .36$). The model of best fit with respect to depression is the unconditional growth model.

Chapter 4

DISCUSSION

The primary aim of this investigation was to understand a proposed mechanism of change in psychotherapy for Borderline Personality Disorder (BPD) through examination of the relationship between alliance and outcome in two well established treatments for BPD. BPD is costly, painful, debilitating, and deadly, and thus, represents a serious clinical and public health concern. Across multiple studies of Axis I psychopathology, alliance has been shown to be a robust predictor of outcome. In addition, formation of an alliance has been written about extensively in theoretical descriptions of the treatment of BPD. However, little systematic research has been conducted to determine the relationship between alliance and outcome in the treatment of BPD. The maximization of efficacy in the treatment of BPD depends upon understanding the specific mechanisms that characterize the disorder and that determine clinical change. In this study, the working alliance in the treatment of BPD was examined with a well standardized observer-rated measure (WAI) and a well characterized and representative sample of reliably diagnosed patients. Archival data were used from a randomized clinical trial, which included well characterized and standardized treatments to minimize competence as a confound for alliance. Through direct investigation of the alliance in a well controlled study of treatments for BPD, we begin to answer important questions regarding the role of alliance in therapeutic change with this population. Three foundational questions regarding the alliance in BPD were posed: 1) do treatment differences exist in the formation of early alliance, in line with an emphasis on supportive and validating techniques early in treatment? 2) is alliance predictive of treatment

retention/termination in this population? And 3) is alliance predictive of treatment response in BPD? The *central hypothesis* for this study was that alliance would be predictive of both retention and outcome in a well-controlled trial of multiple treatments for BPD.

Treatment Differences in Alliance

In order to investigate the first study question, whether treatment differences exist in the formation of the working alliance in patients with BPD, a one-way between groups Analysis of Variance was conducted. Counter to prediction, no main effect for treatment condition was found, indicating that across the three treatments variability in working alliance scores was not significantly determined by treatment assignment. This finding stands as a contrast to the Arntz and colleagues (Spinhoven et al., 2007) who found statistically significantly different levels of alliance across two theoretically distinct treatments (Schema Focused Therapy and TFP). Two salient differences exist between these two studies. First, the perspective from which the working alliance was rated differs; in the present study an observer-rated approach was used (in order to be able to assess reliability of ratings), whereas in Spinhoven et al. (2007) therapist and patient report were used. Second, because of the observer based approach in the present study, ratings were prospective; raters were unaware of the patient's dropout status at the time ratings were made. In contrast, in Spinhoven et al. (2007), a significant proportion of ratings were made retrospectively by therapists after a patient had already dropped out of the study. It is, therefore, possible that the reported group differences between the two treatment conditions in therapist rated working alliance could be an artifact of therapists'

knowledge of dropout status and their downward adjustment of scores for those patients when retrospectively rating them.

Of note, the average working alliance score was 5, indicating that coders observed relatively positive indicators of the working alliance (including a positive relationship, agreement on tasks and goals of therapy) in the early sessions of these psychotherapies. The means found are consistent with the Arntz group's findings of average alliance, as reported by therapist and patient (Spinhoven et al., 2007). In addition, these scores are comparable, or even higher than, other studies using the WAI-O (Cecero, Fenton, Nich, Frankforter & Carroll, 2001; Hatcher & Gillaspay, 2006). In the context of the large clinical literature indicating significant difficulties in the development and maintenance of an alliance in patients with BPD, as well as the research base indicating significant problems with treatment retention, treatment compliance, and therapist burnout (Bongar et al., 1990a; Linehan, Cochran, Mar, Levensky & Comtois, 2000; Zonarini et al, 2001), it is surprising to find relatively high levels of alliance in this sample.

A number of possible explanations for this finding can be offered. First, items on the WAI-O are phrased in terms of both patient and therapist contribution. It is possible that a strong positive impact of the therapist, in any given moment or session, may counteract negative contributions of the patient. Second, because alliance was assessed very early in treatment (within the first 6 weeks of a year long treatment), it is possible that difficulties with respect to the therapeutic relationship, e.g., agreement on and movement toward agreed upon goals, may not have emerged yet in the therapeutic interaction. Third, it is possible that existent difficulties in the relationship (or indications of nascent difficulties) are not easily captured by the items of the WAI-O. Fourth, it is

possible that the scores themselves might not be comparable study to study. For example, given a sample of all BPD patients, “moderate agreement” might mean something different than in a sample of mostly non-personality disordered patients. This is an empirical question which might be best answered in the context of another study in which both personality disordered and non-personality disordered patients are included. Finally, counter to the difficulties described in the treatment of individuals with BPD, from a common factors perspective it is perhaps less surprising that within the context of a study including well trained, adherent, motivated, and closely supervised therapists who believe in their treatment model that there is evidence of comparable and positive levels of alliance, regardless of specific techniques employed.

Alliance as a Predictor of Treatment Retention

The second study question sought to determine if the working alliance is predictive of early treatment termination in these three treatments. It was predicted that working alliance would be a significant predictor of treatment retention such that a more positive alliance would be associated with decreased risk of early treatment termination. Results were consistent with this prediction, indicating that across the three treatment conditions, increases in working alliance were associated with decreased risk of early termination. Because the observed hazard rates (and associated survival functions) for individual treatment conditions were non-proportional (i.e. had different shapes) it was not possible to include treatment condition as a predictor within the cox regression model. Treatment condition was, however, found to be marginally related to treatment retention when considered in isolation, with significantly lower levels of retention in DBT than TFP. The model tested, which included an interaction term between treatment

condition and working alliance, resulted in a non-significant result; this was likely due to low power. In particular, low rates of dropout were present in both high and low alliance TFP cells and the high alliance SPT cell, leaving little non-censored data available for inclusion in the regression model. In contrast, observed frequencies suggest that there may be an interaction between treatment condition and working alliance in predicting early termination.

Using a median split (a relatively non-powerful approach to partitioning data) on the working alliance variable, frequencies of dropout in each condition were investigated. In TFP, a 3.6% difference in dropout risk was found between individuals with lower than average vs. higher than average alliance. In SPT, a 9.8% difference in dropout risk was found between individuals with lower than average vs. higher than average alliance. In DBT, a 38.1% difference in dropout risk was observed between individuals with lower than average vs. higher than average alliance. Although no statistical test of this difference is available, it is noteworthy that a large difference in the frequency of dropout was observed in DBT, while smaller differences were observed in the other two treatments. This finding suggests that treatment differences may exist in the impact of the alliance on dropout and that certain treatments may be better able to deal with difficulties in the alliance than others. In the present study, it appears that the relative importance of working alliance (particularly as a risk factor when difficulties are present) may be greater in DBT than the other two treatments.

Consistent with the current finding, the one other published study of the relationship between working alliance and treatment retention also found a positive relationship between working alliance and treatment duration (Spinhoven et al., 2007). In

contrast to the present study, they found an increased risk of early termination in TFP relative to Schema Focused Psychotherapy. Arntz and colleagues suggest that TFP may cause higher levels of early termination because it includes a “contract phase that by its working out might introduce an unnecessarily defensive and adverse tone to the therapy and in which (negative) transference manifestations are interpreted without the use of explicit supportive interventions” (Spinhoven et al., 2007; p. 112). Given the low frequency of dropout in TFP in the present study, relative to both a supportive treatment and another treatment with explicit goals and requirements (DBT), this assertion seems less relevant. The observed low alliance and increased risk of dropout in the TFP condition of their study is more likely due to the low levels of therapist adherence and competence in this treatment modality, and the relative inexperience of the therapists in the TFP condition compared to those conducting SFT (Levy, Wasserman, Scott, & Yeomans, 2009; Yeomans, 2007). A distinct strength of the present study over the study conducted by Arntz and colleagues is the use of prospective alliance ratings. In Spinhoven et al. (2007), patients who dropped out before the third month of treatment were retrospectively rated on alliance by the therapist only. It is unsurprising that low levels of alliance (affective bond, task and goal agreement) were reported for patients who had already dropped out of treatment. Further research should seek to replicate the overall finding of these two studies, that working alliance early in treatment is predictive of treatment retention. In addition, future studies should make strong efforts to control for adherence and competence across treatment conditions, in order to be in a position to clarify what aspects of a given treatment lead to its retention rate.

To the extent that dropout presents a serious problem in the treatment of BPD, and that the alliance is found to be a reliable predictor of dropout, future research should focus on ways that the working alliance can be enhanced. If future studies demonstrate that the relative impact of alliance on dropout risk is different across treatments, as observed in the present study, it will be important to investigate what aspects of a particular treatment may act to moderate this relationship. The development of Integrative Cognitive Therapy (ICT) for depression by Castonguay et al. (2004) represents such an attempt at addressing potential treatment-specific limitations in alliance development and maintenance. In this approach, unlike traditional cognitive therapy for depression, alliance ruptures are directly addressed as they arise, which may be beneficial to minimizing the impact of negative alliance on treatment retention in a cognitive behavioral treatment such as DBT. Whether the types of therapist responses and interventions employed in response to alliance difficulties will emerge as common in and of themselves (with little variability regardless of treatment orientation) or whether techniques used to improve the alliance will vary as a function of orientation, remains to be seen. Regardless, identifying the disorder specific principles of alliance enhancement in this population represents an important area of future research.

Alliance as a Predictor of Outcome

The final study question examined two inter-related aspects of the potential relationship between working alliance and outcome: the relationship between working alliance and initial functional impairment and working alliance early in treatment as a predictor of treatment response, i.e. change in symptoms and functional impairment during the course of the treatment year. It was predicted that working alliance would be

related to pre-treatment indicators of interpersonal functioning (SAS and GAF). No hypothesis was offered with respect to the relationship of the working alliance with symptom based measures. It was predicted that working alliance would be predictive of treatment response (rate of change) across all functional impairment and symptom based measures. Consistent with the first set of hypotheses, both global functioning (GAF) and social adjustment (SAS) were found to be significantly related to working alliance, such that higher alliance was associated with higher levels of functioning on both of these measures. Symptom based measures for aggression, suicidality, depression, and global symptomatology were unrelated to working alliance.

With respect to the second set of hypotheses, which predicted a relationship between working alliance and treatment response, only equivocal evidence was found. Change in the two primary outcome variables included in this study, aggression and suicidality, was not found to be predicted by working alliance. Change in depressive symptomatology and social adjustment were also not found to be predicted by working alliance. With respect to overall symptomatic distress, there was evidence of a trend level relationship between working alliance and change in the BSI over time. With respect to global functioning, there was a trend level three-way interaction between working alliance, treatment condition, and time. This interaction indicated that (at trend level) there is a difference in the relationship between working alliance and outcome as a function of treatment condition. Specifically, working alliance was found to be significantly more positively related to treatment response for those in TFP than those in SPT. At a trend level, working alliance was also found to be more positively related to response for those in DBT than SPT. Descriptively, working alliance was non-

significantly and negatively related to treatment response for those in SPT, while it was positively related to treatment response for those in DBT and TFP. If this finding were to be replicated in a larger sample, it might indicate that in more active and demanding treatments the working alliance may have a more significant impact on treatment response with respect to external indicators of functional impairment than in a supportive treatment. This may reflect a differential impact of agreement on therapy tasks and goals across treatment types. In both TFP and DBT, goals and expectations are explicitly laid out early in treatment (e.g., obtain and maintain employment in TFP, complete diary cards every week in DBT); deviation from these expectations may, therefore, provide a clear indication of treatment non-compliance. In contrast, to the extent that goals are more amorphous in the supportive treatment, it may be difficult to assess non-compliance.

Broadly, the two findings with respect to overall symptomatic distress and global functioning suggest preliminarily that working alliance early in treatment may moderate treatment response in some domains; however, replication is strongly needed to determine whether the trend level significance of these findings reflects low power in the present study to detect relatively small effects or whether the relationship between these variables in the population is non-significant. Given non-significant findings in four of the six investigated domains and trend level effects in the remaining two, the weight of the evidence suggests that the relationship between working alliance and outcome is not as robust in the treatment of BPD as in the treatment of Axis I pathology. This finding is consistent with the findings of Arntz and colleagues (Spinhoven et al., 2007) who were

unable to document a significant relationship between working alliance three months into a three year treatment and clinical improvement in severity of BPD symptomatology.

A number of considerations should be taken into account when interpreting the equivocal findings of the present study. First, the sample size for the RCT on which this study was based was determined to ensure 80% power to detect between group differences in symptom change on the primary measures. The sample size necessary to detect relatively smaller effects that are characteristic of process studies (e.g., Crits-Christoph & Gibbons, 2002; Horvath & Bedi, 2002) may, therefore, be larger than the sample size needed for outcome studies. To the extent that the study is underpowered, the absence of significant findings may not represent a lack of relationship between working alliance and treatment response, instead it may simply reflect inadequate power.

Alternately, in contrast to the bulk of the existent literature on common factors, and the working alliance more specifically, which find a robust and consistent relationship to outcome in studies of individuals with primary Axis I pathology (Castonguay & Beutler, 2006a; 2006b; Castonguay, Constantino & Grosse Holtforth, 2006; Horvath & Bedi, 2002; Horvath & Symonds, 1991; Martin et al., 2000) this relationship may not exist, or may be less prominent in the treatment of primary Axis II pathology.

A potential confound in this question is length of treatment. By and large, studies of the working alliance-outcome relationship have been conducted in the context of relatively short term psychotherapies (Horvath & Symonds, 1991; Martin et al., 2000). In a twelve or sixteen week treatment, the relative impact of the working alliance at week three might reasonably be expected to be stronger than the working alliance assessed within the first month of a year long treatment given the proximity of the alliance

assessment to ultimate outcomes of interest. In the present study, working alliance was assessed at the fifth and seventh session for two reasons. First, in order to increase power by ensuring that all study participants had alliance data collected regardless of their dropout status. Second, in order to ensure that data were collected during the window when dropout risk is the highest. Despite the strong rationale for early assessment of working alliance, particularly with respect to the second aim, it is possible that a stronger relationship between working alliance and treatment response might be found if the assessment of this construct had taken place later in treatment or trajectories of alliance over time were considered. Early termination in this context represents a proximal outcome and was significantly predicted by alliance; symptom change over the course of the year may simply be too distal from the assessment of working alliance to demonstrate a significant relationship. In future studies, a longitudinal approach to both outcome and process assessment would allow for empirical investigation of the question of whether the relationship between working alliance and treatment response varies as a function of when in treatment data are collected and what index of alliance is used (e.g., early vs. late, since session vs. trajectory).

Strengths and Limitations

This study possessed several strengths. First, the study made use of archival outcome and therapy session (videotape) data from a randomized clinical trial which included well characterized and standardized treatments to minimize therapist competence as a confound for alliance. Second, the patients included in this study were a well characterized and representative sample of reliably diagnosed patients with BPD. Third, a well standardized observer rated measure of alliance was used. The selection of

an observer based measure of alliance was based on a number of considerations. First, whenever patients and therapists provide self-reported data, there is the potential that items are being understood or scored differently by different people. By using an observer based measure, it was possible to ensure through training and inter-rater reliability analyses that items were used consistently across all patient-therapist dyads. In this way, observer ratings provide data for which it is possible to empirically assess the level of reliability and determine an acceptable cut-off. By the conclusion of the training period for the present study, coders had reached consistently high levels of reliability as evidenced by average Intra-class correlations of above .8. Second, the use of an observer rated measure minimizes any effects on reported alliance that might emerge as the result of the differential desirability of engaging in or reporting certain alliance related behaviors across treatments. Utilization of an external observer ensured that patient and therapist behaviors, rather than those behaviors valued by therapists, were the data being used to inform item responses. Finally, an observer based approach represents a strength in the present study because it eliminated an existing confound in published studies (e.g., Spinhoven et al., 2007); raters were blind to dropout status of patients when ratings were made so their scores are unbiased, in contrast to retrospective therapist ratings which are likely influenced by knowledge of treatment status. A final strength of the present study was its application of relatively underutilized statistical techniques, such as hierarchical linear modeling of longitudinal outcome data and survival analysis to model predictors of early termination. These statistical approaches are specifically suited to the structure of the data, and therefore, allowed for the modeling of sophisticated and specific clinical research questions.

This study also possessed several important limitations. First, although the use of an observer rated measures of alliance is considered a significant strength of the study, the absence of process data from either the patient or therapist perspective leaves gaps in our knowledge regarding whether the observed significant and null findings would replicate when approached from these two other respect to the potential relationship between working alliance and outcome might have been more fruitfully answered if more data were available on the working alliance throughout the year of treatment. In particular, to the extent that the early assessment of working alliance was relevant to the question of early termination but provided less useful information regarding the progress of the therapeutic relationship and treatment, additional assessment of working alliance throughout the treatment year would have been valuable. A final limitation of the present study was the sample size. Although steps were taken to maximize available data (e.g. by selecting early sessions for process coding before any attrition had occurred) and techniques were used which capitalized on the available longitudinal data, low power may have obscured findings with respect to questions of both early termination (cox regression model with interaction of treatment condition and working alliance) and the alliance-outcome relationship.

Conclusions and Future Directions

This study sought to elucidate the nature of the alliance in BPD and its relationship to treatment retention and outcome. To a large extent, we are left with more questions than answers. For example, is the absence of an observed group difference in working alliance a replicable finding reflecting the truly common (shared) nature of the

working alliance across different forms of treatment, or, more specific to methodology, did the measure (WAI-O) fail to capture existing differences between groups?

Related to the former, and to complicate matters further, even if relative equivalence in the level of working alliance across different forms of treatment is consistently found, the factors (common or orientation-specific) that contribute to alliance development and maintenance may still be operating differentially across treatments. In order to effectively address such issues, more intensive process coding should be used to compliment clinical trial outcome research. Related to the latter, in order to address the question of whether the WAI-O adequately captures the nature of the alliance in patients with BPD, future studies should consider collecting alliance data prospectively from multiple perspectives (patient, therapist, and observer) and with multiple measures (e.g. WAI, CALPAS, HaQ). If the factor structure within each measure and the relationships among these measures are found to be consistent with those in the existent literature on the working alliance in Axis I pathology, we may proceed with relatively greater confidence that measurement equivalence is present across diagnostic groups (Axis I vs. II). Alternatively, different points of convergence and divergence might be observed when these measures are used with patients with BPD, which would suggest a violation of basic assumptions of measurement invariance and warrant caution in assuming that even well validated measures in one population can be readily used in another population.

To the extent that patient and therapist contributions to the alliance might be separately meaningful and perhaps differentially related to either early termination or outcome, measures that differentiate patient and therapist contribution may be

particularly useful. For example, a study in which the CALPAS is rated by patient, therapist and external observer and then used to predict treatment response would allow researchers to begin to differentiate the impact of different perspectives of alliance ratings on outcome, as well as differentiate the relative impact of patient and therapist contributions to the alliance on outcome. If one perspective was found to be particularly strongly related to treatment retention (e.g., patient) while another perspective was found to predict treatment response (e.g., therapist) this would provide useful information regarding more nuanced aspects of the alliance-outcome relationship. Alternatively, if future studies are unable to establish a clear relationship between the alliance and outcome in patients with BPD, this might suggest the need to revise the measures used to assess the alliance or to begin to consider other therapeutic processes as mechanisms of change.

In addition, to the extent that the working alliance is predictive of treatment retention, is this relationship comparable across treatments? If it is the case that this relationship is different across different therapy approaches, then it will be important to identify moderators that might explain the variability in this relationship (e.g., level of structure, specificity of treatment goals and/or directiveness of the treatment).

With regard to the selection and testing of specific outcome markers, is the working alliance predictive of change in functional impairment and/or symptomatic distress (general or domain specific)? Psychotherapy research has traditionally focused on symptom-based outcome indicators (e.g., depressive or anxiety symptoms) with less attention to functional domains (e.g., interpersonal functioning, work functioning, frequency of hospitalizations). It is possible that the working alliance may be more

predictive of certain outcome variables than others and that the relationship of alliance to a given outcome may be partially a function of the timing of the process assessment.

Future research should begin to address when the optimal time to assess the working alliance is in order to most accurately model this question and the additional questions outlined here.

Finally, although it is extremely difficult to collect large scale datasets on long term therapy trials, future studies must make significant efforts to increase their sample size and utilize sampling techniques that increase power. To the extent that mechanisms, rather than efficacy, are a focus of interest, power analyses should be conducted to ensure adequate power to detect relatively small effects characteristic of process studies.

Consistent with the goal of maximizing power, more frequent assessment of both process and outcome variables will also be critical to being able to evaluate the relationship of in session variables to change over time. With more intensive measurement, the contemporaneous and dynamic relationships between these factors can be modeled over time to address questions pertaining to alliance development and maintenance (e.g., how specific client, therapist, and technical factors influence one another), and alliance-outcome relationships.

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Appendix A

TABLES

Table 1.

WAI Means and Standard Deviations

	<u>M</u>	<u>SD</u>	<u>Min.</u>	<u>Max.</u>
Total	4.99	0.45	3.86	6.01
Bond	5.22	0.33	4.46	5.96
Task	5.16	0.49	3.97	6.25
Goal	4.60	0.59	3.04	5.81

Note. WAI = Working Alliance Inventory – Observer Form (1 – 7). M = Mean; SD = Standard deviation; Min = Minimum rating; Max = Maximum rating.

Table 2

Correlations among WAI and WAI Subscales

		WAI	Bond	Task	Goal
WAI	Pearson Correlation	1			
Bond		.912**	1		
Task		.976**	.841**	1	
Goals		.980**	.841**	.946**	1

Note. WAI = Working Alliance Inventory – Observer Form; N = 88; * = $p < .05$; ** = $p < .001$.

Table 3.
WAI and WAI subscale Means and Standard Deviations Across Treatment Conditions

	TFP		DBT		SPT	
	M	SD	M	SD	M	SD
Total	4.96	0.49	4.99	0.44	5.02	0.45
Bond	5.16	0.36	5.19	0.31	5.30	0.31
Task	5.15	0.54	5.17	0.47	5.16	0.49
Goal	4.55	0.61	4.63	.061	4.61	0.56

Note. WAI = Working Alliance Inventory – Observer Form (1 – 7). M = Mean; SD = Standard deviation

Table 4.
Summary of Observed Dropout Frequencies

Treatment Group	WAI	Total N	Dropout N	Completer Percentage
TFP	Low	16	4	75%
	High	14	3	78.6%
	Overall	30	7	76.7%
DBT	Low	14	10	28.6%
	High	15	5	66.7%
	Overall	29	15	48.3%
SPT	Low	12	4	66.7%
	High	17	4	76.5%
	Overall	29	8	72.4%
Overall	Overall	88	30	65.9%

Note. WAI = Working Alliance Inventory – Observer Form; WAI Low < 5, WAI High ≥ 5.

Table 5.

Solution for Fixed Effects of Alliance and Treatment Condition Predicting GAF

<u>Effect</u>	<u>Tx</u>	<u>Estimate</u>	<u>SE</u>	<u>df</u>	<u>t</u>	<u>p</u>	<u>CI (95%)</u>
Intercept		49.93	1.02	98.4	49.10	<.001**	47.91 - 51.95
Month		1.70	0.29	156	5.91	<.001**	1.13 - 2.27
Month*Month		-0.08	0.02	129	-3.72	<.001**	-0.13 - -0.04
WAI_c		5.15	2.22	86.3	2.32	<.023**	0.73 - 9.57
Month*WAI_c		-0.49	0.45	57.6	-1.09	<.278	-1.39 - 0.41
Month*WAI_c*Tx	1	1.12	0.55	52.8	2.03	<.047**	0.01 - 2.24
Month*WAI_c*Tx	2	1.17	0.59	58.3	1.96	<.054*	-0.02 - 2.36
Month*WAI_c*Tx	3	0	.	.	.	.	.

Type 3 Tests of Fixed Effects

Effect	Num DF	Den DF	F Value	p
Month	1	156	34.91	<.001**
Month*Month	1	129	13.87	<.001**
WAI_c	1	86.3	5.37	0.023**
Month*WAI_c	1	64.2	1.15	0.288
Month*WAI_c*Tx	2	56.8	2.55	0.087*

Note. Tx = Treatment Condition; 1=TFP, 2=DBT, 3=SPT; WAI_c = WAI centered at 5;

SE= Standard Error; CI = Confidence limits; Num DF=Numerator Degrees of Freedom;

Den DF=Denominator Degrees of Freedom; * = $p < .10$; ** = $p < .05$.

Table 6.

Solution for Fixed Effects of Alliance and Treatment Condition Predicting SAS

<u>Effect</u>	<u>Tx</u>	<u>Estimate</u>	<u>SE</u>	<u>df</u>	<u>t</u>	<u>p</u>	<u>CI (95%)</u>
Intercept		5.24	0.17	96.9	30.29	<.001**	4.90 – 5.59
Month		-0.20	0.04	157	-5.32	<.001**	-0.27 - -0.12
Month*Month		0.01	0.003	134	3.33	<.001**	0.004 – 0.02
WAI_c		-0.55	0.21	86.9	-2.60	<.011**	-0.97 - -0.13
Tx	1	-0.63	0.23	82.2	-2.73	<.008**	-1.08 - -0.17
Tx	2	-0.29	0.23	82.5	-1.26	<.21	-0.75 – 0.16
Tx	3	.	.	.	.	.	.

Type 3 Tests of Fixed Effects

Effect	Num DF	Den DF	F Value	p
Month	1	157	28.33	<.001**
Month*Month	1	134	11.07	<.001**
WAI_c	1	86.9	6.76	0.011**
Tx	2	82.9	3.73	0.028**

Note. Tx = Treatment Condition; 1=TFP, 2=DBT, 3=SPT; WAI_c = WAI centered at 5;

SE= Standard Error; CI = Confidence limits; Num DF=Numerator Degrees of Freedom;

Den DF=Denominator Degrees of Freedom; * = $p < .10$; ** = $p < .05$.

Table 7

Solution for Fixed Effects of Alliance Predicting BSI

<u>Effect</u>	<u>Estimate</u>	<u>SE</u>	<u>df</u>	<u>t</u>	<u>p</u>	<u>CI(95%)</u>
Intercept	96.81	3.81	124	25.42	<.001**	89.28 - 104.35
Month	-3.92	0.99	190	-3.97	<.001**	-5.87 - -1.97
Month*Month	0.14	0.08	186	1.77	<.079*	-0.02 - 0.30
WAI_c	3.49	8.25	112	0.42	0.67	-12.87 - 19.84
Month*WAI_c	-1.16	0.69	198	-1.69	0.09*	-2.52 - 0.19

Type 3 Tests of Fixed Effects

Effect	Num DF	Den DF	F Value	p
Month	1	190	15.78	<.001**
Month*Month	1	186	3.12	<.079*
WAI_c	1	112	0.18	<.674
Month*WAI_c	1	198	2.85	<.093*

Note. WAI_c = WAI centered at 5; SE= Standard Error; CI = Confidence limits; Num

DF=Numerator Degrees of Freedom; Den DF=Denominator Degrees of Freedom; * =

$p < .10$; ** = $p < .05$.

Appendix B**FIGURES**

Figure 1: Survival function based on treatment condition

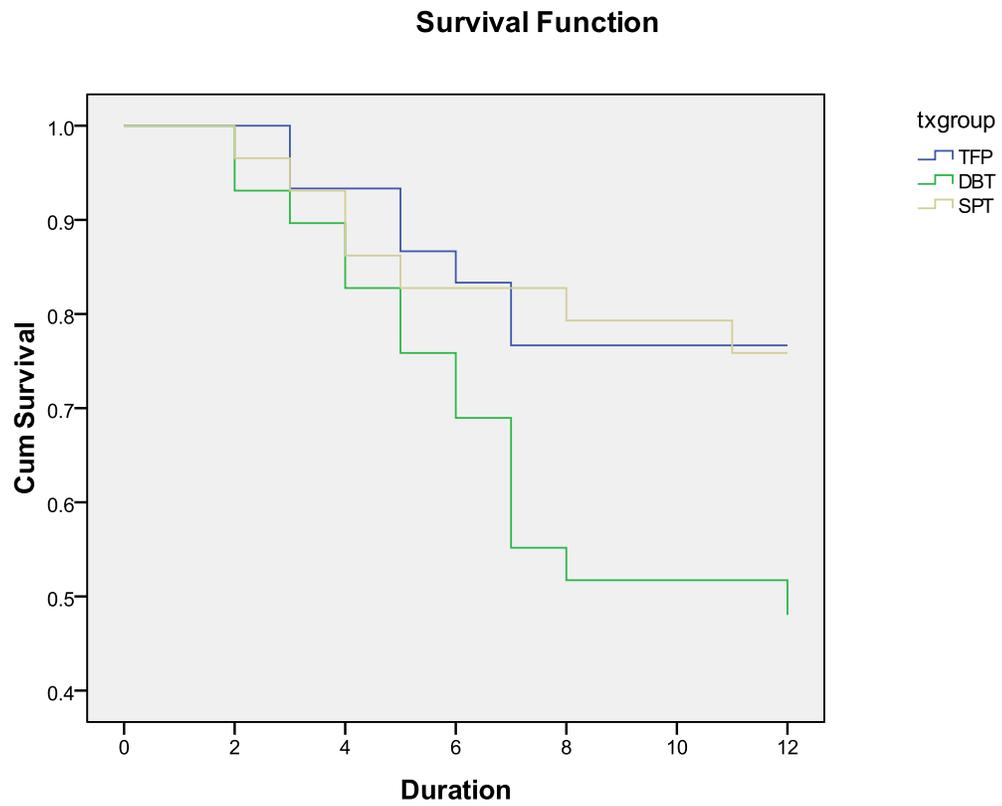


Figure 2: Alliance and Treatment Condition as a Predictor of GAF

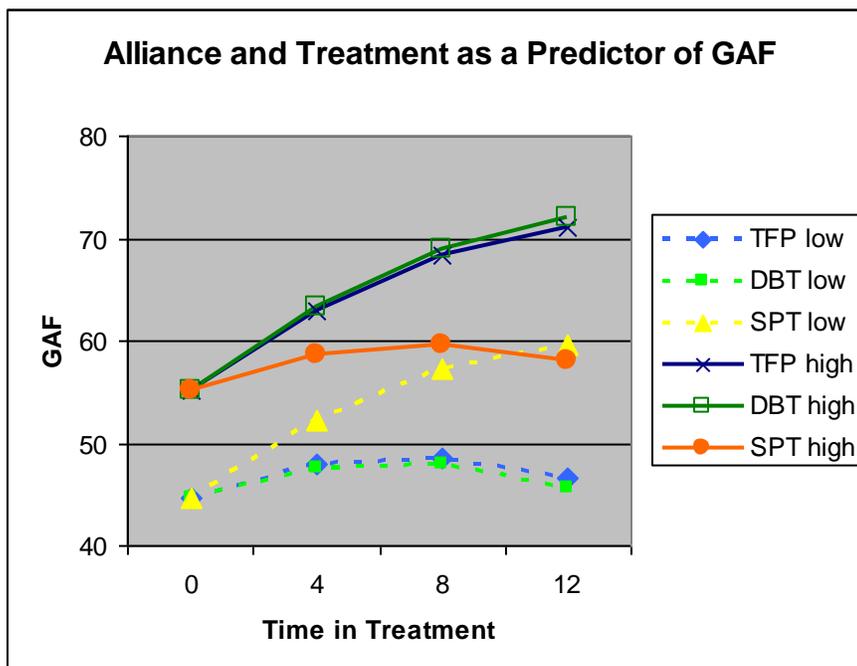
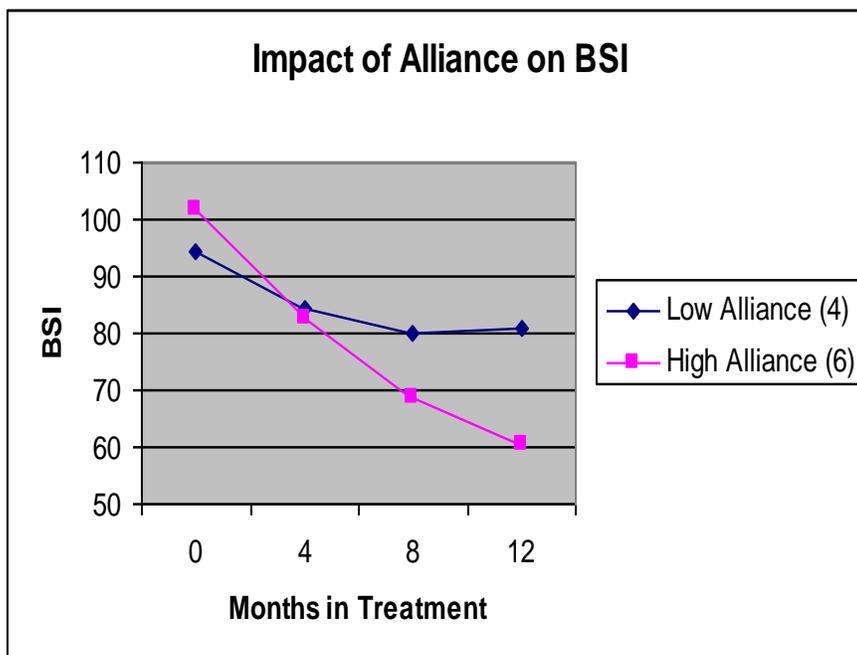


Figure 3: Alliance as a Predictor of BSI



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Publications

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