

## ABSTRACT

### Factors Affecting the Therapeutic Alliances' Impact on Substance Use Disorder Treatment Outcomes

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The therapeutic alliance has been shown to significantly affect outcomes in both general psychotherapy research and substance-use-disorder specific research. The proposed study is an attempt to improve our understanding of *how* therapeutic alliance factors influence outcomes when treating substance-use-disordered clients. Two factors of the therapeutic alliance and outcome interaction were investigated: social support and timing of measurement of the therapeutic alliance. High levels of social support at baseline did not predict better outcomes when a strong alliance was not formed with the therapist. Alliance at termination was the most predictive of short and long-term outcomes.

Factors Affecting the Therapeutic Alliances' Impact on Substance Use Disorder  
Treatment Outcomes

by

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A Dissertation

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## CHAPTER ONE

### Introduction

Throughout history, humans have sought alternative states of consciousness through the use of substances. Some use substances with impunity, as a means of socializing, relaxing, or simply to enjoy the taste, while at the other extreme, individuals become self-destructively and even fatally dependent. Every day, over 700,000 individuals with substance use disorders are receiving treatment (NIAAA 10th Special Report to Congress, 2000). Rates of success in substance abuse treatment are not as high as researchers, clinicians, and society would like: Only approximately 20% of alcoholics and substance abusers who received behavioral treatment remained continuously abstinent for 1 year following treatment (Project MATCH, 1997; Hubbard et al., 2003). Many studies have examined the role of treatment-specific variables, such as length and type of treatment (e.g., Hubbard et al., 2003), and the efficacy of different substance abuse treatment modalities themselves (Finney, Wilbourne, & Moos, 2007). Others have focused on individual differences, such as severity of dependence, the presence of comorbid psychiatric disorders, and personality factors (e.g., Project MATCH, 1997). One variable under-represented in this literature is the relationship between therapy process variables and treatment outcomes. Specifically, in need of investigation are the variables that predict and moderate the relationship between treatment process and outcome.

### *General Psychotherapy Findings*

Psychotherapy research on the differential effectiveness of various treatment interventions and theoretical approaches has indicated a similar level of effectiveness between treatment modalities (Gloaguen et al. 1998; Lispey and Wilson, 1993; Shaddish et al., 2000). Some small but inconsistent advantages for cognitive behavioral therapy approaches have been suggested (Lambert & Barley, 2002). However, reviewers have suggested that larger CBT effect sizes are obtained by a strong bias toward analogue studies, as well as studies including mild cases. The similarity in outcomes across treatments points to the importance of “common factors” related to all treatments.

In a meta-analysis of 20 years of psychotherapy outcome literature Lambert and Barley (2002) identified 4 key components of change. These 4 areas and the respective variance that can be accounted for by each include: extra-therapeutic change 40%, expectancy 15%, technique 15%, and common factors 30%. The important extra-therapeutic factors identified by Barley and Lambert (2002) are relational in nature.

Outside of therapy, patients often seek support from other relationships including friends, family, clergy, and self-help groups (Lambert & Barley, 2002). Although acquiring extra-therapeutic support can be encouraged by the therapist it is largely out of their control as a formal intervention strategy. Similarly, a client’s expectancy is often determined before treatment begins and can only be partially shaped by the therapist early in treatment.

Despite only accounting for 15% of the variance in therapeutic change, technique receives much attention in both clinical training and research. This is likely because technique is very much determined by the therapist and can be adequately



assessed and altered as needed. Common factors have received less attention likely because these factors are considerably more ambiguous, fluid, and difficult to measure. However, when carefully attended to, common factors can be capitalized on by savvy therapists to the benefit of their clients.

According to Barley and Lambert (2002) common factors can be separated into therapist, client, and therapy process factors. Therapy process factors may be best thought of as an interaction of therapist and client factors. The therapeutic alliance, a therapy process factor, has been identified as the most robust of the common factors for predicting treatment outcomes for both adolescents and adults (Horvath & Bedi, 2002; Shirk & Karver, 2003)

As seen below, in the substance-abuse-specific treatment outcome literature, this process factor has been largely overlooked in favor of examining the effects of client- and therapist-specific factors, which is counter to the findings of Lambert and Barley (2002).

### *Substance Abuse Treatment Outcome Studies*

#### *Client Factors*

There have been several client factors investigated as impacting outcomes in substance-use-disorder treatment. Studies have focused on factors such as severity of alcohol or drug use, comorbid psychiatric disorders, gender, age, ethnicity, education level, employment status, coping style and motivation (Haaga, Hall, & Haas, 2006). The understanding of what impact these factors has on treatment outcome is equivocal and in need of further study. Of the factors mentioned, only two have found results which are not conflicting: gender and employment status. Client gender has consistently shown no

effect on treatment outcome (Haaga, Hall, & Haas, 2006). Being employed apparently produces better outcomes, but socioeconomic status and having a tangible responsibility is likely a confounding variable in these results.

### *Therapist Factors*

Clear differences in success rates exist among therapists who treat substance use disorders. One important factor appears to be the psychological health of the therapist as judged by their peers (Najavits & Weiss, 1994). In their 1994 study of 95 recovering drug abusers, Najavits and Weiss found a moderate correlation between being a healthier therapist and success with male drug abusers. It is also apparent that interpersonal skills, empathy, and less confrontation lead to better outcomes (Finney, Wilbourne, & Moos, 2007).

Studies that investigate “non-therapy” therapist factors such as race, ethnicity, religion, spirituality, and therapist-patient matching on these dimensions are limited for substance-use-disorder outcome research. Therapist factors including age, gender, and education level have been shown to have no effect on therapy alliance (Connors et al. 2000). Although frequently hypothesized to be related, numerous studies have found no significant relationship between therapist recovery status (i.e., whether a therapist is in remission from a substance use disorder or has ever been identified as having a substance use disorder) and outcomes for substance-use-disorder treatment (Culbreth 2000; McLellan et al., 1988; Project Match Research Group, 1997).

Client and therapist factors, at least as previously measured, do not seem to yield robust enough relationships to therapy outcome. Instead, common factors in the therapeutic relationship may be more fruitful targets for research in therapy outcome.

First, however, treatment specific variables which affect outcome will be briefly reviewed.

### *Treatment Factors*

Outcome researchers in the field of substance-use-disorder treatment have typically investigated which existing treatments modalities work best, doing so-called “horserace” studies. In their review of effective treatments for substance use disorders, Finney, Wilbourne, and Moos (2007) used box score comparison methods to identify treatments that work. The limitation of a box score comparison method is that when several fair treatments are compared one is still identified as the “best” treatment. The identified treatment is only “best” amongst a group of treatments which may be only moderately effective. This limitation suggests that some caution be taken when interpreting box score results. However, community reinforcement approaches, cognitive behavioral therapy, twelve-step facilitation and treatment, behavioral couples therapy, family treatment, and motivational enhancement proved to be the most effective among those compared (Finney, Wilbourne, & Moos, 2007). Generally, these effective treatments assess life contexts and assist substance dependent individuals in adapting to their life circumstances. Confrontational methods, educational lectures, and general counseling proved to be the least effective techniques when compared to the other available treatments.

The common aspects of the effective treatments listed above include 1) support, 2) goal direction, 3) therapy structure, 4) rewards that compete with substance use, 5) focus on abstinence-oriented norms, and finally 6) models and attempts to develop self-efficacy and coping skills. Moos (2003) suggests that these common threads emphasize

“social aspects” of client change and are the “active ingredients” of effective treatment.

The apparent value of social variables as a prime force for change in substance dependent clients suggests a necessity to better understand the therapist-client relationship and how that social dyad can impact treatment outcome.

### *Therapeutic Alliance and Substance Abuse Treatment*

Therapeutic alliance may be thought of as “the collaborative relationship between client and therapist; it reflects their emotional bond, the therapist’s empathy for the client, and a shared presumption about the tasks and goals of treatment” (Bordin, 1975. p. 8). There are clinically important reasons to pay attention to the therapy alliance with substance dependent clients. Various outcome studies in both general therapy and substance treatment demonstrate that clients who report a strong initial alliance are significantly more engaged and retained in treatment, which leads to better outcomes for up to 6 months (e.g., Barber et al. 2001; Petry & Bickell, 1999). Thus strong initial alliance is critical to a substance dependent population which is traditionally the most difficult group to engage and retain in treatment.

Psychotherapy research combined with the particular nature of the substance-use –disordered client supports the need for a strong therapy relationship. General psychotherapy research indicates that therapy serves as a model for improving relationships outside of therapy (Greenson 1965; Henry & Strupp 1994). When clients are able to successfully manage their relationships in therapy, they are likely to generalize that relational learning beyond therapy (Strupp & Binder, 1984). Therapeutic generalization is key to the recovering substance-use-disordered clients because several studies have indicated that social support at baseline and following treatment is a key

prognostic indicator for recovery (e.g., McCrady & Nathan, 2006; Moos, 2003). The substance-dependent client often has numerous damaged relationships either because of or leading to their substance use disorder, making the importance of the quality of the therapeutic relationship paramount.

Considering the relational damage associated with addictive lifestyles and the importance of social support in successful treatment outcomes, the ability to understand and improve relationships is integral to a substance-use-disordered client's recovery.

Furthermore, the therapy relationship, indexed by the therapeutic alliance, may be especially important for those clients lacking adequate social support.

#### *Client Factors and the Therapeutic Alliance*

Severity of drinking or drug use, psychiatric severity, gender, and ethnicity are client factors which have no significant effects on the therapeutic alliance (Barber et al., 1999; Belding et al., 1997; Connors et al., 2000; DeWeert-Van Oene et al., 1999, Luborsky et al., 1995; Petry & Bickel, 1999). However, client factors in other studies, demonstrate effects on the therapeutic alliance. In a recent randomized controlled trial (Barrowclough et al., 2010), 116 substance-use-disordered clients with comorbid psychotic disorders were found to have poorer alliance when they held negative attitudes toward treatment. In another therapy alliance study (Connors et al., 2000), outpatient clients with less education reported a lower level of alliance with their therapist. Connors et al. (2000) also found that depression positively predicted alliance in 489 aftercare patients in cognitive therapy, motivational enhancement therapy, and twelve-step facilitation conditions using the Working Alliance Inventory- Patient version (WAI-P) in multivariate analyses. Finally, readiness to change was predictive of client-rated

therapeutic alliance in two treatment studies (Connors et al., 2000; Joe et al., 1998). This suggests that a higher degree of motivation, which seems to impact treatment outcomes, may be mediated by the therapeutic alliance.

### *Therapist Factors and the Therapeutic Alliance*

Some researchers have identified therapist factors that both positively and negatively influence the therapeutic alliance. Henry and Strupp (1990) found that clients with highly rated alliance and positive treatment outcomes characterized their therapists as warm, attentive, interested, understanding, respectful, experienced, and active. Ackerman and Hilsenroth (2003) also identified empathy, flexibility, and openness as significantly improving the alliance. As might be expected negative therapist characteristics such as uncertainty, criticalness, distractedness, and being overly directive and confrontational has a negative impact on the alliance (Ackerman & Hilsenroth 2003). These findings are consistent with the well-established motivational interviewing approach for substance use disorders, which is rooted in aligning with clients by taking a non-confrontational approach (Miller & Rollnick, 1990).

### *Therapeutic Alliance and Outcomes*

Investigations of alliance and outcome are fairly limited within the substance-use-disorder treatment outcome literature. In their 2005 review of alliance and outcome, Meir, Barrowclough, and Donmall concluded that a large proportion of the variance in outcomes as predicted by therapeutic alliance remained unexplained. They identified twenty-four studies related to outcome and alliance; ten of these studies identified treatment retention as the outcome factor of interest, four utilized “treatment

engagement,” another four measured drug and alcohol use, three emphasized psychiatric well-being measures, and the final three described various other outcomes, respectively.

A variety of alliance measures were used in the studies, including the Helping Alliance Questionnaire for patient and therapist- version II (HAq-II), the California patient and therapist versions (CALPAS), Working Alliance Inventory patient and therapist versions (WAI-p, WAI-t), and the Vanderbilt Therapeutic Alliance Scale (VTAS). The majority of alliance measures were administered early in treatment. The major conclusion of this review was that early treatment alliance positively predicts treatment outcomes within the first six months.

Within the studies that investigated the therapeutic alliance’s relationship to outcome it was repeatedly shown that alliance and outcome measures which were more temporally proximal were more highly related (Meir et al., 2005). Furthermore, these studies measured the early treatment alliance (1<sup>st</sup> 3 sessions) and found those alliance measures to be related to early retention, better treatment engagement, decreased substance use while in treatment, and more days abstinent three months post treatment (Barber et al., 2000; 2008; Carroll & Nich, 1997; Fenton et al., 2001; Petry & Bickel, 1999).

There have been no known studies that have successfully identified therapy alliance as a predictor of long-term outcomes within a substance-use-disordered population. However, there are a few general psychotherapy findings that suggest later alliance is important to outcomes.

In a study of emotion-focused therapy for adult survivors of childhood abuse Paivio and Patterson (1999) compared the predictive value of the WAI -O at sessions 3,

4, 10, and termination. Session 4 alliance predicted some but not all post-treatment changes in psychological and behavioral functioning. However, the termination session WAI scores predicted all post-treatment functioning. In a study of 8 and 16 session psychotherapies for depression, with alliance measured at every session, later alliance scores were more significantly correlated with outcomes than early alliance (Stiles et al., 1998). An even more compelling finding by Florsheim et al. (2000) was reported for adolescent in-patients: Whereas 3 *week* positive alliance predicted negative outcomes, 3 *month* positive alliance predicted positive outcomes.

The predictive value of therapeutic alliance at termination on both short and long-term outcomes for a substance use treatment population is a necessary next step in understanding the relationship of therapeutic alliance and outcome. We know that alliance fluctuates during treatment and that a repaired alliance has a strong therapeutic impact (Muran & Safran, 1996). Measuring changes in alliance up to the end of treatment could potentially capture the important and unexplained impact that alliance at termination has on outcome.

#### *Baseline Social Support and Functioning as a Predictor of Outcome*

A gap in the literature identified by Meier et al. (2005) related to outcome and alliance with substance use disorders includes a need to better understand how the quality of past and present social functioning moderates the alliance/outcome relationship.

Numerous studies in the general psychotherapy research consistently suggest that clients with more social support find it easier to establish a successful working alliance with their therapist, are better engaged and retained in treatment, and have better short and long term outcomes (Eames & Roth 2000; Gelso & Carter, 1985; Kokotovic & Tracy,



1990; Mallinckrodt, 1995; 2000; Moras and Strupp, 1982). Identifying parallel findings within a substance-use-disordered sample could lead to improved and more targeted interventions with substance-use-disordered clients who are lacking in social capital.

Effective social support for an alcohol dependent client requires specific support of their change to a non-drinking lifestyle (Zywiak, Neighbors, Martin, Johnson, Eaton, Rohsenow, 2009). Persons recovering from alcohol use disorders have shown worse outcomes when their primary support group is supportive of drinking and *not* supportive of abstinence (Zywiak et. al, 2009). It is not well understood how therapy alliance and positive social support might interact and will be addressed in this study.

### *Study Aims*

The aim of the current study is to examine the relationship between therapeutic alliance and treatment outcome in an alcohol dependent population. This study was designed to elucidate how alliance at different time points relates to outcomes. A secondary aim was to evaluate the role of baseline social support on the therapy alliance-outcome relationship. Results of this study should help substance abuse treatment researchers further refine and target more effective treatments in this difficult population, as well as clinicians who understand the importance of a strong therapeutic relationship.

### *Hypotheses*

*H1- The 3 different ratings of alliance, including the observer, client, and therapist will be significantly correlated.*

*H2- Alliance score totals will predict drinks per drinking day and percentage of days abstinent at three, six, and twelve months post-treatment after controlling for baseline drinking.*

*H3- Alliance at different times in treatment will have different predictive validity, with alliance at the termination session being the most predictive of drinks per drinking day and percentage of days abstinent at one year post treatment.*

*H4- The alliance to outcome relationship will be moderated by drinking specific social support and AA meeting attendance. Those participants with more drinking specific social support and AA meeting attendance will require less alliance throughout treatment.*

## CHAPTER TWO

### Methods

#### *Parent Study*

The participant data to be used for this study were collected during a larger study, a randomized clinical trial, which occurred between 2001 and 2005. The current study, which began in 2009, used data from the parent study including scores from one measure of social support, one measure of drinking outcomes, and one measure of therapeutic alliance. The use of those data are explained below. The current study also added one measure of observer rated therapeutic alliance. This measure, explained in detail below, required listening to and rating 405 of the therapy tapes from the parent study.

The original study included 182 male and female patients 21 years of age and older, who were recruited from an outpatient treatment program for substance use disorders. All participants met with current Diagnostic and Statistical Manual for Mental Disorders, Fourth Edition (DSM-IV; American Psychiatric Association, 1994) diagnosis of Alcohol Dependence. The purpose of the study was to gain further knowledge about the effectiveness of combining psychotherapeutic interventions with psychopharmacological interventions in the treatment of alcohol dependence.

Specifically, Broad Spectrum Treatment (BST), a manualized, “next generation CBT treatment,” was the treatment of interest (Gulliver et al., 2005). The psychotherapeutic interventions of BST and Motivational Enhancement Therapy (MET) in concert with treatment and placebo conditions of Naltrexone were analyzed. It was hypothesized that

BST, as “the next generation” of CBT intervention, would produce better outcomes than the more established evidence-based intervention of MET when combined with Naltrexone (Davidson et al., 2007b). BST patients did have a significantly higher percentage of days abstinent than patients in the MET treatment group (Davidson et al., 2007b). A secondary aim of the study was to determine the need for long-term use of Naltrexone in preventing relapse. It was found that extended use of Naltrexone up to 24 months did not significantly improve drinking outcomes, and medication compliance degraded significantly after 12 weeks (Davidson et al., 2007b). However, later analyses suggested that extended NTX combined with BST did increase the median time to first drink and time to first heavy drinking day (Longabaugh et al., 2009).

### *Procedures*

#### *Motivational Enhancement Therapy (MET)*

Motivational Enhancement Therapy (MET) is a systematic intervention approach for evoking change. It is based on principles of motivational psychology, and is designed to produce rapid, internally-motivated change (Miller & Rollnick, 2002). This treatment strategy does not attempt to guide and train the client, step-by-step, through recovery, but instead employs motivational strategies to mobilize the client's own change resources. It may be delivered as an intervention in itself, or it may be used as a prelude to further treatment. The approach is considered client-centered and Rogerian in style. This approach assumes a dichotomy of motivating factors within the alcohol user: those motivating factors related to the inherent rewarding nature of alcohol versus competing motivations such as the unfavorable consequences of alcohol use. The intervention

assumes that it is most effective to elicit self-motivational statements of desire for or commitment to change. Treatment outcome research strongly supports MET strategies as effective in producing change in problem drinkers (Borsari & Carey, 2000; Marlatt et al., 1998; Miller et al., 1993).

The MET approach used in the parent study was based on a manual adapted from Project MATCH (1997). The first session of MET lasted for 90 minutes. This initial MET session consisted of a two step process; a review of the drinking-related domain assessments, followed by the completion of a change plan worksheet. Their relevant drinking information in the domain assessments (e.g., quantity and frequency of alcohol use, psychological, behavioral, and social consequences of alcohol use, and legal involvement related to alcohol use) was compared with norms for a normal and treatment seeking population. Liver function tests and neuropsychological test performance were also reviewed. The negative effects of alcohol as evidenced by the domain assessments were used as “motivation for change” and aided in the completion of the change plan worksheet. The change plan worksheet was to be used in the subsequent 30 minute sessions which were held monthly following the initial 90 minute session. In the monthly MET sessions, motivational interviewing techniques were utilized when discrepancies existed between the initial stated goals and actual behavior (Davidson et al., 2007a). A maximum of 4 MET sessions were permitted and most participants in the sample received (78%) four MET sessions.

### *Broad Spectrum Treatment (BST)*

Broad Spectrum Therapy (BST) is a specific intervention designed for tailoring alcohol treatment to alcohol dependent clients based on their assets and liabilities in living a non-drinking lifestyle. The intervention is based on findings that no one intervention is suitable for all alcohol dependent individuals (Project MATCH, 1997). It offers the therapist a flexible and systematic structure to work within when designing intervention strategies for and with their clients. Following an initial 90 minute assessment related to assets and liabilities for abstaining from alcohol, treatment modules are chosen for the client that best suit their circumstances. This is done through a decision tree model in which five main domains of cognitive functioning, spousal/family functioning, interpersonal functioning, job satisfaction and residence stability are assessed in adapting treatment to the participants circumstances. For example, a client with a significant other who is supportive of the client continuing drinking may receive a couples counseling session to address this discrepancy between client and partner objectives. Another example of the flexibility of BST is the adding of a drink refusal skills session or functional analysis session following a client relapse. BST may also include less conventional interventions including encouraging AA attendance or assisting a participant in finding suitable housing.

In the parent study, all BST assigned patients received MET “styled” therapy throughout their treatment. Similar to the MET condition, the first session in the BST condition lasted 90 minutes. Subsequent sessions lasted 60 minutes, 30 minutes longer than the MET sessions. BST intervention calls for a “MET style” (e.g., nonconfrontational style) throughout treatment. Therefore it is conceivable that MET and

BST effects were not segregated. However, there were structural and dosage differences between BST and MET conditions. Patients in BST received an ideal minimum of 8 core sessions and up to four additional therapy sessions based on psychosocial functioning resources and functional analysis assessed before therapy.

### *Naltrexone*

The drug Naltrexone was approved by the FDA in 1994 to treat alcohol dependence. Naltrexone in conjunction with other established psychotherapies has proven to improve drinking outcomes, especially in the first 90 days after treatment (O'Malley et. al 1992). Naltrexone acts as an opioid receptor antagonist. The specific mechanism of action which makes Naltrexone effective in treating alcohol dependent patients is not fully understood. However, many believe that Naltrexone's modulation of the dopaminergic receptors in the mesolimbic dopamine reward system diminishes the reward and craving associated with alcohol (Nestler, Hyman, & Malenka, 2008). All subjects received 50 mg of Naltrexone, taken by mouth daily, for the first twelve weeks of the trial. After 12 weeks of the trial, half of the sample from each psychosocial treatment condition was randomly assigned to cross over to placebo for the second twelve weeks. The other half continued to receive 50mg of Naltrexone.

### *Therapist Training*

Therapists with a master's degree and a minimum of 2 years experience in treating individuals with Alcohol Dependence using one or more broad Cognitive Behavioral Therapies were selected to treat the participants. Eligible therapists received initial training consisting of didactic and demonstration sessions provided by the authors

of the original study (Gulliver et al., 2005). Before treatment of a participant, each therapist treated a minimum of two pilot cases over an 8-week period, one per condition (either MET or BST). Audio taped sessions were reviewed by the supervisor and the therapist. All study therapy sessions were then audio-taped for review by the supervisors. To monitor treatment integrity, the therapist, patient, and supervisor each completed post-session checklist ratings. If therapist performance was judged to be problematic, supervision was intensified until the problem was resolved. Four therapists were trained to criterion and were assigned to patients on the basis of their availability. All therapists were trained in both treatment modalities to control for the possibility of a main effect of the therapist. The majority of patients (89%) were treated by one therapist who was with the study for its duration (Davidson et al., 2007b). In the original study participants were randomly assigned to Motivational Enhancement Treatment (MET) or Broad Spectrum Therapy (BST).

In previous studies of treatments for substance-use-disordered clients, the interactive effect of therapy alliance and type of psychosocial treatment was found to be non-significant (Carroll et al., 1997). Several psychosocial treatments were compared, including; twelve-step facilitation, motivational enhancement therapy, and cognitive therapy. Therapeutic alliance did not interact with treatment type in its effect on outcome, suggesting that for the current study, collapsing across treatment modalities seems appropriate. However, there were significant differences in drinking outcomes between MET and BST in the original study (Davidson et al., 2007a). This may have been due to mere dosage effects (BST averaged 7 1 hour sessions beyond the initial assessment, while MET was typically 3 half hour sessions), or some actual benefit of



BST over MET. Therefore, type of treatment will be controlled when considering the effect of therapy alliance on outcome.

## CHAPTER THREE

### Measures

#### *Therapeutic Alliance Measures*

##### *Self-Report Alliance Measure*

All participants and their therapists completed a brief therapeutic alliance rating scale following each therapy session in the original treatment study. Therapeutic alliance data from the original study's rating scales will be utilized in the analysis. The rating scales completed by therapists and participants during the first, third and final sessions are the data of interest. The scales consisted of eight 5-point Likert scaled items related to the therapist and participants' subjective experiences of alliance with the other. For the data used in this study Cronbach's alphas for the 8 item therapist and 8 item client alliance rating scales were .78 and .81, respectively. See appendix A for item examples.

##### *Observer-Rated Therapeutic Alliance*

The first, third, and last sessions for the 155 included participants were listened to by independent raters and coded for degree of therapeutic alliance. The widely utilized Working Alliance Inventory- Observer Version (WAI-O) was the scale used for assessing alliance on the therapy tapes. The WAI-O is a 36 item scale designed to assess the strength and dimensions of the alliance. The measure is based on Bordin's (1980) pantheoretical, tripartite (bonds, goals, and tasks) conceptualization of the alliance.

Evidence has supported the relationship between the WAI and other relational indicators, adequately supporting the measure's validity (Horvath & Greenberg, 1986). Tichenor

and Hill (1989) found that the WAI-O has high internal consistency with a coefficient alpha of .98 and a high inter-rater reliability with an intra-class correlation of .92. Fenton et al. (2001) found that the WAI-O was significantly correlated with treatment outcome for manual-guided therapies for substance use. The total 36 item scale of the WAI-O for the data used in this study yielded a Cronbach's alpha of .73.

### *Tape Coders*

Tape coding using the WAI-O was performed by two advanced graduate students in the Baylor University clinical psychology doctoral program and one social work graduate student. Each psychology student had completed over 3000 supervised clinical hours of training, of which more than two thirds was time spent in psychotherapy sessions as student therapists. The Baylor Social Work student had no therapy experience but was able to be trained to a high level of inter-rater reliability ( $r > .80$ ) within two coding sessions.

This writer completed one third of the coding, including all first session taped therapy sessions included in the sample. Due to the potential for bias in coding in a direction consistent with the writer's hypothesis two mitigating measures were undertaken. First, the writer only coded first sessions and was blind to the other two data points included in the hypothesized model. The remaining two time points, session three tapes and final/termination session tapes were coded by the other two graduate students.

This writer had no prior knowledge of the existing outcome data and this data was controlled by the writer's research supervisor until all coding was completed.

### *Establishing Reliability*

In utilizing the WAI-O it was necessary to establish competence (training to criterion) and inter-rater reliability among the three observing raters. Competence was established by having raters code therapy session tapes provided by the expert, and the expert then compared the coders' ratings to her own criterion rating. The expert rater monitored reliability of ratings for each rater by performing periodic checks for drift in the observer ratings. After training to criterion was firmly established for each rater, inter-rater reliability was established by having each rater code the same session tapes, randomly selected from a pool of sessions with clients not to be used in this study, then performing intra-class correlations. The minimum intra-class correlation between raters was set at  $r=.80$ . Once this level was established, raters began coding tapes for this study. Approximately 10% of tapes were checked for coder drift, and with a total of 405 tapes coded this means that 1 of every 10 tapes were checked for inter-rater reliability. During the course of ratings all reliability scores were above the minimum level described above. In fact the mean intra-class correlation for all raters and sessions was quite high,  $r=.95$ .

### *Outcome Measure*

The Time Line Followback (TLFB) is an interview-administered measure of alcohol consumption. Retrospective drinking data is collected using a calendar and other memory prompts to aid the interviewer and interviewee in producing an accurate record of drinking. The interviewer records the number of drinks taken for each day on the calendar. The TLFB is useful in collecting a range of sensitive drinking data including the maximum, minimum, and modal number of drinks consumed. Measures selected for

this study included percent days abstinent in the baseline period (30 days prior to treatment entry) or at any follow-up point (84 days after treatment completion, 168 days after that, and 336 days after that) and average drinks per drinking day at each time point. Good test- retest up to one year has been found in both in-patient and out-patient groups (Maisto, Sobell, and Cooper, 1979).

The validity of the TLFB has been verified by multiple sources. One study reported that days of incarceration and hospitalization as recorded in the TLFB interview corresponded well with official records (Cooper et. al, 1981). Also, the TLFB and collateral informant data have shown a high correlation for total drinking days, while a moderate correlation was found for low and high consumption days (e.g., O’Farrell et al., 1984; Maisto, Sobell, & Sobell, 1979). Furthermore, concurrent validity has been evidenced by good agreement between standardized pre-treatment interviews and the TLFB (Maisto et al., 1982).

In summary, the TLFB technique is a psychometrically sound method of retrospectively assessing drinking patterns over periods ranging from 1–12 months. The TLFB data used for this study was not used beyond the twelve month time point. The TLFB was used in the original study to collect drinking data 1 time each assessment visit up to eighteen months.

#### *Important People and Activities- Alcohol Version (IP-A)*

In the parent study the Important People and Activities- Alcohol Version (IP-A) was used to determine the level of social network support received by participants. More specifically, the IP-A was used to characterize social support functionality and drinking specific social support in the following areas: spouse/ partner support, family

support, friend support, workplace support, and residential support. Based on assessing these 5 areas of social support participants were placed in one of seven potential categories: 1= High functioning network, supports abstinence, 2= High functioning network, supports drinking, 3= Low functioning network, supports abstinence, 4= Low functioning network, supports drinking, 5= no network, 6= High functioning network, neither supports drinking nor abstinence, and 7= low functioning network, neither supports drinking nor abstinence. Participants in the categories with less network support for abstinence who were also selected for BST treatment were offered specific interventions to bolster their level of support for not drinking. Participants in the MET condition were offered no specific intervention based on this assessment.

For the purpose of this study these seven categories were dichotomized, one for general support and one for abstinence support. Those groups (described above) considered supportive of abstinence were groups one and three, while groups two and four were considered not supportive of abstinence. General support was dichotomized into high functioning and low functioning. Groups one, two, and six were considered high functioning, while three, four, five, and seven were put into the low functioning group. Spouse/partner, family, friend, and workplace support will be the four domains considered. Residential support will not be considered in these analyses as more than half of the original data points were missing. Each domain was scored as 0 for low functioning or not supportive of abstinence, and 1 for high functioning or supportive of abstinence. Next the total score for social support in each of the four domains was totaled, yielding one abstinence support score ranging from 0-4 and one general support score ranging from 0-4. The IPI-A data were analyzed in this study to determine if the

effects of drinking specific social support or general social support could have a differential impact on drinking outcomes depending on the degree of therapeutic alliance formed with the therapist. That is, the moderating effects of social support on the alliance to outcome relationship are investigated. Components of the IPI-A that were considered in the analyses have shown adequate internal consistency for the general support ( $\alpha=.84$ ) and support for abstinence ( $\alpha=.85$ ) in previous studies (Zywiak et al, 2009). For the data used in this study Cronbach's alphas for the abstinence support and general support rating scales were .75 and .79, respectively. These components of the IPI have also shown good predictive validity, as they have predicted alcohol use up to 12 months post-treatment (Project MATCH, 1997).

## CHAPTER FOUR

### Results

This study sample included 155 of the 182 original participants. Those included were the participants who had post-drinking treatment data available up to 12 months following treatment and at least one of 3 completed, recorded, and audible therapy sessions. Participants were abstinent from alcohol from 3 to 21 days before treatment initiation ( $SD=6.31$ ). All participants met full criteria for DSM-IV alcohol dependence with an average age of onset of 26 years ( $SD=8.62$ ). The sample included 99 males (64%) and 56 females (36%). The mean age of all the participants was 44 years ( $SD=8.03$ ). There were 6 African Americans (3.8%), 137 Caucasians (88.3%), one Asian American (.6%), 4 Native Americans (2.5%), 5 Hispanic Americans (3.2%), and 2 participants who identified as “other” (1.2%). Of the 155 participants selected for this study, 13 did not graduate from high school (8.4%), 58 graduated from high school (37.4%), 19 graduated from a trade or certificate program (12.2%), 43 graduated from college (27.7%), 17 had a graduate degree (10.9%), and 5 individuals were classified as "other" (3.2%). There were 68 married participants (43.9%), 33 non-married participants (21.3%), 13 identified as separated (8.3%), 40 divorced, and 1 as widowed (0.6%). There were 103 participants who were working full-time (65.8%), 11 worked part-time (6.4%), 37 were unemployed (23.8%), 2 were retired (23.9%), 1 was disabled (0.6%), and 1 identified as a full-time homemaker (0.6%).

The data from the above 155 participants were included in the analyses. For all 36 variables used, 89.34% of the necessary data was non-missing and 10.66% was



missing. See Table 1 below for a breakdown of the percentages of missing data for the independent and dependent variables of interest. The missing data were imputed using the multiple imputation method in the SAS program.

Table 1  
*Percentage of Missing Data by Variable*

Variable	Session	%Missing
WAI-O	1	19.35
WAI-O	3	15.48
WAI-O	T	24.51
TA-C	1	9.03
TA-C	3	15.48
TA-C	T	16.77
TA-t	1	21.29
TA-t	3	23.22
TA-t	T	24.03
AA-a	N/A	20.45
IP-A	N/A	0.00
TLFB	N/A	2.50

*Note:* WAI-O= Working Alliance Inventory Observer; TA-C= Client Therapeutic Alliance; TA-t= Therapist Therapeutic Alliance; AA-a= Alcoholics Anonymous attendance; IP-A= Important People and Activities; TLFB= Timeline Follow Back

*H1: The 3 different ratings of alliance, including the observer, client, and therapist will be significantly correlated.*

There were three measures of therapeutic alliance considered in the analyses. The WAI-O was the observer rated measure while the therapist and client completed a brief measure of alliance after each session. The therapists' reported alliance ranged from 18 to 40 on a scale from 8 to 40. The clients' reported alliance ranged from 17 to 40 on a scale from 8 to 40. The observers' rated alliance ranged from 132 to 252 on a scale from 36 to 252. (See table 2 below for mean alliance ratings by session.)

Table 2  
*Mean Alliance Ratings by Rater and Session*

Rater	R	S1	S3	T
Therapist	8-40	35.00	29.21	32.11
Client	8-40	36.00	34.00	37.07
Observer	36-252	210.93	216.00	219.13

*Note:* R=Range; S1=Session 1; S3=session3; T= Termination

The three scoring perspectives assessed at session one, three and during the termination session were correlated using the Pearson correlation procedure in the SAS program. For session one all raters had significantly correlated alliance ratings (see Table 3). For session three (see Table 4) the client and observer had the only statistically significant correlation for their ratings of alliance,  $r = .40$  ( $p < .01$ ). Termination session ratings of alliance (Table 5) were significant for the client and observer,  $r = .18$  ( $p < .01$ ), and the client and therapist,  $r = .28$  ( $p < .01$ ).

Table 3  
*Session 1 Correlations for Alliance Raters*

Rater	Therapist	Client	Observer
Observer	.26**	.19**	-
Client	.26**	-	-

\*p<.05, \*\*p<.01

Table 4  
*Session 3 Correlations for Alliance Raters*

Rater	Therapist	Client	Observer
Observer	0.02	.41**	-
Client	0.05	-	-

\*p<.05, \*\*p<.01

Table 5  
*Termination Session Correlations for Alliance Raters*

Rater	Therapist	Client	Observer
Observer	0.05	.28**	-
Client	.18**	-	-

\*p<.05, \*\*p<.01

*H2: Alliance score totals for the WAI-O will predict drinks per drinking day and percentage of days abstinent at follow-up assessment*

Using a linear regression model in the SAS program the alliance score totals for the WAI-O measurement of session one, three, and termination were used to predict percentage of days abstinent and drinks per drinking day at 84, 168, and 336 days post-

treatment. Treatment type (BST vs. MET), sex, age, marital status, race, education, employment, age of onset of dependence symptoms, and baseline drinking were entered as control variables for all time points and outcome variables.

At 84 days post-treatment percentage of days abstinent (PDA) was not predicted by the WAI-O total score. However, at 168 and 336 days post-treatment the WAI-O total score did significantly predict PDA (see Table 6). Baseline drinking, (PDA at baseline) was the only other significant predictor of outcome for this model. More days abstinent at baseline predicted more days abstinent at each post-treatment time point.

At 84, 168, and 336 days post-treatment, drinks per drinking day (DDD) was not predicted by the WAI-O total score for sessions one, three, and termination. Similar to the findings for PDA, baseline DDD was a significant predictor for all post-treatment time points in this model. Additionally, participants in the BST treatment condition had significantly fewer drinks per drinking day at the 168 and the 336 day time points.

Table 6  
*Regression Results for PDA Treatment Outcomes*

Variable	B	SE B	<i>B</i>	P-value
Days Post-tx= 84	-	-	-	-
B-PDA	0.27	0.09	0.17	.00**
BST	3.31	5.12	0.04	.52
WAI-O	0.07	0.06	0.12	.27
Days Post-tx= 168	-	-	-	-
B-PDA	0.38	0.11	0.19	.00**
BST	8.02	6.21	0.09	.19
WAI-O	0.17	0.07	0.22	.02*
Days Post-tx= 336	-	-	-	-
B-PDA	0.48	0.11	0.24	.00**
BST	4.15	6.47	0.04	.52
WAI-O	0.17	0.08	0.22	.03*

\*p<.05

\*\*p<.01

*Note:* B-PDA= Baseline Percentage of Days Abstinent; BST= Broad Spectrum Treatment; WAI-O= Working Alliance Inventory- Observer

Table 7  
*Regression Results for DDD Treatment Outcomes*

Variable	B	SE B	<i>B</i>	P-value
Days Post-tx= 84	-	-	-	-
B-DDD	0.59	0.05	0.98	.00**
BST	-3.41	2.07	-.09	.09
WAI-O	-0.02	0.03	-0.05	.58
Days Post-tx= 168	-	-	-	-
B-DDD	.74	0.07	0.94	.00**
BST	-6.13	2.74	.12	.03*
WAI-O	0.01	0.04	0.01	.87
Days Post-tx= 336	-	-	-	-
B-DDD	0.78	0.06	1.04	.00**
BST	-5.72	2.40	-.012	.02**
WAI-O	0.78	0.06	1.04	.00**

\*p<.05, \*\*p<.01

*Note:* B-DDD= Baseline Drinks per Drinking Day; BST= Broad Spectrum Treatment; WAI-O= Working Alliance Inventory- Observer

In addition to the linear regression model above Pearson  $r$  correlations between all time points of alliance (session 1,3 and termination) and all post-treatment assessments of drinking outcomes were completed. The results were consistent with previous findings related to alliance and outcome in that most outcomes were significantly correlated with the working alliance (see Table 8). Alliance measured later in treatment (Session 3 and Termination) was more consistently significantly predictive of outcome.

Table 8  
*Correlations for Alliance and Outcome*

Outcome/Days Post-Tx	WAI-O (Session 1)	WAI-O (Session 3)	WAI-O (Termination)
PDA-84	0.02	.18**	0.09
PDA-168	.15**	.19**	.25**
PDA-336	.10**	.14**	.21**
DDD-84	-0.06	-.27**	-.01
DDD-168	-.08*	-.18**	-.11**
DDD-336	-.13**	-.18**	-.11**

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

*Note:* PDA= Percent Days Abstinent; WAI-O = Working Alliance Inventory - Observer; DDD= Drinks per Drinking Day

*H3: Alliance at termination will have the most predictive validity at one year post-treatment*

The predictive value of the three different session measurements of alliance was investigated to determine if the first, third, or termination session was the best predictor of drinking outcomes at 336 days post-treatment. A hierarchical regression

method using the SAS program was used. The session total scores for alliance were entered into the prediction model in the order in which they occurred in treatment; session 1, session 3, and termination. PDA and DDD were the outcome variables of interest. Additionally baseline drinking was included for each model due to its high prediction value of post-treatment drinking.

After adding alliance scores for session 1 to baseline PDA in the hierarchical model the total model accounted for approximately 15% of the variance in outcome for 336 day post-treatment PDA. PDA at baseline was a significant predictor, but session 1 alliance was not. After adding session 3 alliance approximately 19% of the variance was accounted for. Baseline PDA remained significant in the model and session 3 alliance was also significant. Finally, after adding termination alliance scores 26% of the variance in 336 PDA outcome was accounted for. Only termination alliance and baseline PDA remained significant in this model. WAI-O scores at sessions 1 and 3 were not significant in the model (see Table 9 below for model).

Table 9  
*Hierarchical Regression Results for PDA at 336 days Post-Treatment*

Model/ Variables Entered	B	SE B	<i>B</i>	P-value	R-Square
Model 1	-	-	-	-	.15
B-PDA	0.56	0.10	0.39	.00**	-
WAI-O-Session 1	0.21	0.18	-0.08	.29	-
Model 2	-	-	-	-	.19
B-PDA	0.53	.108	0.39	.00**	-
WAI-O-Session 1	-0.31	0.21	-0.18	.60	-
WAI-O-Session 3	-0.10	0.09	-0.09	.13	-
Model 3	-	-	-	-	.26
B-PDA	0.56	0.09	0.38	.00**	-
WAI-O-Session 1	-0.29	0.19	0.11	.14	-
WAI-O-Session 3	0.10	0.16	0.05	.51	-
WAI-O-Termination	0.35	0.07	0.36	.00**	-

\*p<.05, \*\*p<.01

*Note:* B-PDA= Baseline Percent Days  
Abstinent; WAI-O = Working Alliance  
Inventory - Observer

After adding alliance scores for session 1 to baseline DDD in the hierarchical model the total model accounted for approximately 52% of the variance in outcome for 336 day post-treatment DDD. DDD at baseline is significant to the model but session 1 alliance is not. After adding session 3 alliance the amount of variance accounted for remained unchanged at 52%. Baseline DDD remained significant to the model but session 3 was not significant. Finally, after adding termination alliance scores 54% of the variance in PDA at 336 post-treatment was accounted for. However, only baseline DDD was significant in this model. Session 1, 3 and termination alliance score remained non-significant (see Table 10 below model).



Table 10  
*Hierarchical Regression Results for PDA at 336 days Post-Treatment*

Model/ Variables Entered	B	SE B	<i>B</i>	P-value	R-Square
Model 1	-	-	-	-	.52
B-DDD	0.75	0.06	0.72	.00**	-
WAI-O-Session 1	0.01	0.08	0.04	.95	-
Model 2	-	-	-	-	.52
B-DDD	0.74	0.06	0.71	.00**	-
WAI-O-Session 1	0.04	0.08	0.03	.60	-
WAI-O-Session 3	-0.10	0.09	-0.09	.13	-
Model 3	-	-	-	-	.54
B-DDD	0.74	0.05	0.72	.00**	-
WAI-O-Session 1	0.04	0.08	0.03	.64	-
WAI-O-Session 3	-.05	0.07	-0.48	.40	-
WAI-O-Termination	-0.09	0.03	-0.19	.10	-

\*p<.05, \*\*p<.01

*Note:* B-DDD= Drinks per Drinking Day-Baseline; WAI-O = Working Alliance Inventory - Observer

*H4- The alliance to outcome relationship will be moderated by drinking specific social support and AA meeting attendance*

In order to test the moderating effects of social support and AA meeting attendance on the alliance to outcome relationship a regression using interaction terms for alliance and social support variables and alliance and the AA attendance variable were modeled. All p-values were .10 or greater for the interaction terms and therefore not statistically significant.

## CHAPTER FIVE

### Discussion

#### *Inter-Rater Agreement*

The accurate and reliable measurement of a subjective construct such as the therapeutic alliance is a lofty goal. There can be considerable disagreement about what makes for a strong working relationship in therapy, and even when two involved parties might agree on the fundamentals of a strong alliance they may have very different interpretations of the same clinical interactions. For this reason checking agreement between alliance perspectives is important when data are available. Therefore the first analysis for this study checked the agreement between the different raters of alliance (client, therapist, and observer). This was investigated using the Pearson correlation procedure ( $r$ ).

Session one ratings of alliance showed statistically significant agreement between all three raters. Session three had significant agreement between the client and observer but not between the therapist and observer or therapist and client. The termination session showed significant agreement between the client and observer and the client and therapist but not between the observer and therapist. Approximately 67% of all correlations were statistically significant. The mean correlation was approximately  $r = .14$ , whereas most previous studies have reported a mean of  $r = .25$  or higher (Horvath, 1994). There may be a fairly straightforward explanation for this lower level of agreement between raters. For the therapy sample in this study approximately 85% of the therapy sessions were completed by a single therapist. The three correlations

which did not reach statistical significance included the therapist as one of the raters. The majority of treatment studies have at least 5 different therapists completing a nearly equal portion of the total therapy sessions. If there had been more therapists completing the alliance ratings it is possible that there would have been a broader range of therapist alliance data and more overall agreement between raters. Also there was a notable ceiling effect for all of the alliance data which can be seen in Table 2. Although the alliance data for all raters showed an adequate range the overall means for all sessions were toward the top end of the scales.

#### *WAI-O Predictive Validity*

Previous substance use disorder treatment research has shown that early alliance, measured in the first three sessions, predicts drinking and drug use outcomes in the first three months post-treatment (Barber et al., 2000; 2008; Carroll & Nich, 1997; Fenton et al., 2001; Petry & Bickel, 1999). However alliance in the first three sessions has not proven to significantly predict longer term post-treatment outcomes, including 6 or 12 months post-treatment (Barber et al., 2000; 2008). Furthermore working alliance measured later in treatment has not been carefully studied as it relates to substance use outcomes. Therefore, beyond replicating previous findings of the predictive value of the working alliance early in treatment, this study attempted to obtain a more complete picture of the alliance's predictive value throughout treatment, with special attention to the end of treatment.

Although early alliance helps to retain and engage clients in treatment and has some apparent short-term impact on outcome, a strong alliance at the end of treatment may be a key to carrying treatment gains further beyond the formal treatment time. By

the end of treatment the therapeutic relationship has had more time to develop into a meaningful and integrated source of change for the client.

In order to better delineate the importance of temporal factors when measuring the alliance the first analysis examined the overall predictive value of alliance throughout treatment. This was done by using the total alliance score from the combination of sessions 1, 3, and the termination session. Results indicated that an overall higher working alliance predicted more abstinent days at 168 and 336 days post-treatment but not at 84 days post-treatment. These results conflict somewhat with the only major study that investigated total alliance scores and post-treatment substance use as an outcome. Barber et al (1999) found that total treatment alliance for 252 cocaine dependent participants predicted drug use at one month but not at six or twelve months. More studies are needed to fully understand how total alliance throughout treatment predicts subsequent drinking and drug use outcomes.

Baseline PDA was a significant and consistent predictor of post-treatment PDA for each follow-up point. In fact, both baseline drinking variables used in this study's regression models (PDA and DDD) were the best predictors of all post-treatment drinking. This finding is consistent with data from most substance use treatment outcome studies. In Project COMBINE, for example, a large, multi-site, NIAAA-funded alcohol treatment outcome study, both baseline percent days abstinent and percent heavy drinking days were significantly associated with post-randomization drinking trajectories (Gueorguieva et al., 2010). These findings are also consistent with a 2009 review of client predictors of alcohol treatment outcomes in which it was found that baseline alcohol consumption was the most consistent predictor of multiple outcomes, including

post-treatment drinking (Adamson, Sellman, & Frampton, 2009). The consistency of baseline drinking predicting post-treatment drinking in this and other studies highlights the difficulty of successfully treating severely substance dependent clients, and the need to capitalize on less considered but important treatment factors like therapeutic alliance.

#### *WAI-O Predictive Validity for DDD*

Related to alliance, the regression results for DDD were quite different from those for PDA. None of the WAI-O measurements (including total alliance and alliance at each time point) predicted DDD at any post-treatment follow-up time point. However, participants that had been in the BST treatment condition did have significantly fewer drinks per drinking day than those in the MET treatment condition. As mentioned above baseline DDD significantly predicted all post-treatment DDD assessments.

There are a number of potential explanations for the different findings for PDA versus DDD in these regressions. One possibility is that the “abstinence violation effect” is at play in these data. The abstinence violation effect is based on Alan Marlatt’s 1985 cognitive model of substance use disorder recovery. In his model a combination of the alcohol dependent client’s outcome expectancies and poor self-efficacy about drinking increase the chance of relapse.

An alcohol dependent client often has the outcome expectancy that having even one drink impairs their ability to stop drinking more, along with a history of failed attempts at controlling their drinking. That history leads to a sense of poor self-efficacy for controlling the amount of alcohol consumed once drinking begins. Therefore, a single instance of drinking behavior along with negative outcome expectancies and poor self-efficacy for stopping can lead to a full-blown relapse.

The abstinence violation effect would significantly increase the DDD data while having little impact on the PDA because the participants who had even one drink would likely drink much more, significantly increasing DDD. Conversely, those participants who remained abstinent would not have a great decrease in PDA as they are on a more stable path of ‘non- abstinence violation.’

The specific effect of BST on DDD but not on PDA is harder to explain. It could simply be that BST rather than MET had some harm reduction effect, reducing drinks per drinking day, while not significantly increasing post-treatment abstinent days. While abstinence is often considered the best goal for those clients with alcohol dependence, harm reduction decreases the number of negative consequences related to drinking, while striving for total abstinence. For example, simply reducing participants DDD could lessen drinking related health risks for certain clients.

For this study all participants in both BST and MET were given data (usually in the first session) about the poor outcomes for moderating drinking after meeting full criteria for alcohol dependence. However, if the client was not willing to consider abstinence the therapist encouraged and praised clients about any decreases they made in their drinking from session to session. Although MET is thought more of as a harm reduction treatment than BST, in this study BST was conducted in a an “MET style.” Therefore both treatment conditions had the potential for a harm reduction effect.

The fact that BST may have had a larger harm reduction effect (i.e., encouraging decreased hazardous drinking vs. encouraging total abstinence) could be due to some specific advantage of BST treatment over MET for this outcome. However, because we know that MET is an effective harm reduction treatment it is possible that a

more conservative explanation is warranted. In this study BST had 4 more sessions on average than MET. Also, with the exception of the first session, the average BST session was 30 minutes longer than the average MET session. Simply increasing the number of sessions and time in treatment has been shown to have a significant positive impact on treatment outcomes (Goethell et al., 1992).

The correlation data relating the WAI-O and outcome revealed a pattern of significant results that were consistent with later alliance predicting long-term outcomes better than early alliance predicting long-term outcomes. In fact, early outcomes were not as well predicted by early alliance as later outcomes were predicted by later alliance. Previous findings suggest increasing the “temporal proximity” of the alliance and outcome measurements increases their relatedness (Meir et al., 2005). Therefore, one would expect that early alliance and early outcomes would be significantly correlated along with later alliance and later outcomes significantly correlated.

However, most studies have only measured early alliance and outcomes and therefore cannot compare those findings to later alliance with later outcomes. A few non-substance use disorder treatment outcome studies exist where later alliance and outcomes were investigated. These studies offered promising evidence of the importance of later alliance in predicting outcomes (see Florsheim et al., 2000; Paivio & Patterson, 1999; Stiles et al., 1998). The findings from these general psychotherapy studies are consistent with the findings of this substance use treatment study and emphasize the importance of alliance at the end of treatment. More studies of later alliance and outcomes in the substance use disorder treatment field are needed.

Using a hierarchical regression model with PDA as the drinking outcome also yielded results suggesting that later alliance is key to predicting outcomes at 336 days.

Adding the termination alliance to the model which included baseline PDA, and both session 1 and session 3 alliance increased the variance explained by the model from 19% to 26%. Furthermore, the addition of the termination session made sessions 3 and 1 non-significant factors in the model. This left only the termination session and baseline PDA as significant predictors of drinking outcomes. These results are consistent with previous general psychotherapy research findings mentioned above, and provide further evidence that later alliance works best to predict longer-term outcomes.

The hierarchical regression model with DDD as the drinking outcome did not show alliance at termination to be a significant predictor of 336 days post-treatment DDD. Alliance at termination did increase the overall variance explained by the model from 52% to 54%, however this was not a significant increase. In fact, baseline DDD was the only significant predictor of DDD at 336 days and accounted for 52% of the variance by itself.

In the DDD model there was considerably less variance remaining to be accounted for compared to the model with PDA as the outcome variable. The large impact of baseline DDD decreased the possibility of having any significant predictor, including the alliance variables. In addition to the abstinence violation effect mentioned earlier, the high importance of DDD at baseline may be related to confounding issues of dependence severity. More severe cases of dependence at baseline would likely include those participants who had the highest rates of DDD. It would be consistent with previous alcohol treatment outcome findings that those participants with more severe



dependence would also be less likely to benefit from treatment (Adamson, Sellman, & Frampton, 2009; Miller et al., 1992).

#### *Relationship between Therapeutic Alliance, Social Support and AA Attendance*

Previous research has found social support and AA involvement to be significant factors in predicting alcohol treatment outcomes (Zywiak et al., 2009). We also know from previous research and this sample that therapeutic alliance reliably predicts drinking outcomes. It was hypothesized that these factors might interact with each other to influence outcomes. It was thought that participants with lower levels of social support and AA attendance would require more alliance with their therapist in order to have more PDA and fewer DDD at post-treatment follow-up. However, the moderating effects of social support and AA attendance on the alliance to outcome relationship were not significant in this sample when tested using interaction terms in a regression model. Although further study is needed it seems that the important treatment outcome factors of social support, and AA attendance may function independently of the therapy alliance. It may also be that in this study, because those in the BST condition without good social support at baseline had at least one session on obtaining, growing, and maintaining good social support, this variable was not a predictor of outcome. In addition, all clients were treated in a non-confrontational, MET style, suggesting that they may have felt more positively about their therapists as sources of social support than clients in other studies. It may have been that social support was targeted so well in treatment that it washed out as a predictor of outcome. Future research may be able to explore this further.

### *Implications and Future Research*

The findings of this research may be helpful in guiding future studies related to alliance and outcome. Most importantly, the timing of measuring alliance when predicting outcome should be considered. Previously, for theoretical and practical purposes early alliance has been considered the most important time for measuring the alliance. It makes sense that a client who does not align with their therapist early in treatment would have more difficulty throughout treatment, in terms of attendance and engagement, and subsequently have worse outcomes post-treatment. However, data from this study indicated that it may be equally important to be “aligned” well at the end of treatment.

Theoretically speaking, emphasizing alliance at termination makes as much sense as emphasizing early alliance. Many prominent interpersonal, psychodynamic and even behavioral theorists emphasize the importance of “ending well” in therapy. One of the main suggestions of these theorists is that this is a time in the therapy where clients are often triggered about the ending of previous relationships. The quality of termination can be “emotionally corrective” or a negative repetition of previous termination patterns (Teyber, 2006).

It is understood that a poor termination can be destructive to the therapeutic progress which had been made. In a thoughtful termination process the therapist approaches the end of treatment intentionally with particular therapeutic tasks in mind. Some of those tasks include summarizing the therapy process, coming to agreement about what changes were made during therapy (which can also be seen as increasing self-efficacy for change) and areas where progress is still needed, and offering the client a

chance to speak about any unresolved therapeutic issues. This termination process is possibly an alliance-related intervention in that it reinforces agreement about or offers a chance to repair any disparity about the goals, tasks, and bonds within the therapy relationship.

An important next step in this research is to examine how the quality of termination interacts with therapy alliance. This could be accomplished by including both an objective measure of termination quality and alliance on the same sample's termination sessions. Measuring both alliance and termination quality could help understand how these two processes likely interact and overlap. Furthermore these studies would rule out the possibility that alliance at termination is most predictive of longer-term outcomes simply because it is the most "temporally proximal" measurement of alliance.

### *Clinical Implications*

The psychotherapy relationship between substance-use-disordered clients and their therapists is different because the client enters into this relationship having lost tangible coping mechanisms and sources of pleasure because many of their personal relationships have been strained by their behavior. This may strain the therapeutic relationship in a unique way and thus account for the significantly greater difficulty in retaining and engaging substance-disordered clients compared to other Axis-I disordered clients. Furthermore, substance use disorders are chronic problems which often require long-term abstinence or reduced use to ensure recovery. This long-term behavior change often requires multiple courses of therapy, and if a client has a negative experience in an early course of therapy, s/he may not want to return for help when it is needed during

subsequent relapses. Therefore, there is a need to better understand the therapy process mechanisms which predict positive long-term outcomes. This is the first known study which systematically investigated how well the therapy alliance at the end of treatment predicted long-term drinking outcomes. Further research is needed to investigate how the end of treatment affects subsequent outcomes and what occurs in the interim between the final session and follow-up. This research could investigate qualitative factors related to alliance such as the integration of the therapists' words, or perception of the therapy relationship.

Having identified alliance at the end of treatment as a determinant of long term drinking outcomes highlights the need for carefully managing the therapy relationship at termination with this population. Clinicians who work in substance use disorder treatment should work hard to address issues of alliance during the termination process. Furthermore, when designing and implementing evidence based treatment manuals the inclusion of a thoughtful and thorough alliance-relevant termination process is key. This termination process should be flexible enough to not only be implemented in the final sessions but also if the client decides to terminate prematurely. In the case of early and unannounced termination clients should be given an opportunity to return for one more session in order to address termination and therapeutic alliance concerns. Given that specific therapy modalities produce similar outcomes, further examination of how this common factor, the therapeutic alliance, affects outcome seems critical to increase the success of our substance use treatments.

## APPENDIX

### Therapist-Patient Alliance Form

For the session today, \_\_/\_\_/\_\_, with your patient, # \_\_ please rate how strongly you agree with each of the following statements;

1. I really understood my patient today.

1-----2-----3-----4-----5  
Strongly agree                      Neutral                      Strongly disagree

2. I conveyed my interest in how my patient is doing.

1-----2-----3-----4-----5  
Strongly agree                      Neutral                      Strongly disagree

3. I felt close to my patient.

1-----2-----3-----4-----5  
Strongly agree                      Neutral                      Strongly disagree

4. I feel as though my patient and I are a team, working to help him/her get better.

1-----2-----3-----4-----5  
Strongly agree                      Neutral                      Strongly disagree

5. I am on my patient's side.

1-----2-----3-----4-----5  
Strongly agree                      Neutral                      Strongly disagree

6. We work well together.

1-----2-----3-----4-----5  
Strongly agree                      Neutral                      Strongly disagree

7. I would prefer a different patient.

1-----2-----3-----4-----5  
Strongly agree                      Neutral                      Strongly disagree

8. I've had other patients who I understood better.

1-----2-----3-----4-----5  
Strongly agree                      Neutral                      Strongly disagree

## REFERENCES

- Ackerman, S.J., & Hilsenroth, M.J. (2001). A review of therapist characteristics and techniques negatively impacting the therapeutic alliance. *Psychotherapy: Theory, Research, Practice Training*, 38, 171–185.
- Ackerman, S.J., & Hilsenroth, M.J. (2003). A review of therapist characteristics and techniques positively impacting the therapeutic alliance. *Clinical Psychological Review*, 23, 1–33.
- Adamson, S.J., Sellman, J.D., Frampton, C.M. (2009) Patient predictors of alcohol treatment outcome: a systematic review. *Journal of Substance Abuse Treatment*, 36, 75-86.
- Barber, J.P., Luborsky, L., Crits-Christoph, P., Thase, M.E., Weiss, R., Frank, A., Onken, L. & Gallop, R. (1999) Therapeutic alliance as a predictor of outcome in the treatment of cocaine dependence. *Psychotherapy Research*, 9, 119-124.
- Barber, J. P., Connolly, M. B., Crits-Christoph, P., Gladis, L., & Siqueland, L. (2000). Alliance predicts patients' outcome beyond in-treatment change in symptoms. *Journal of Consulting & Clinical Psychology*, 68(6), 1027.
- Barber, J.P., Luborsky, L., Gallop, R., Crits-Christoph, P., Frank A., Weiss, R., Thase, M.E., Connolly, M.B., Gladis, M., Foltz, C. & Siqueland, L. (2001) Therapeutic alliance as a predictor of outcome and retention in the National Institute on Drug Abuse Collaborative Cocaine Treatment Study. *Journal of Consulting and Clinical Psychology*, 69, 119-124.
- Barber, J. P., Gallop, R., Crits-Christoph, P., Barrett, M. S., Klostermann, S., McCarthy, K. S., & Sharpless, B. A. (2008). The role of the alliance and techniques in predicting outcome of supportive-expressive dynamic therapy for cocaine dependence. *Psychoanalytic Psychology*, 25(3), 461.
- Barber, J. P., Gallop, R., Crits-Christoph, P., Frank, A., Thase, M. E., Weiss, R. D., & Gibbons, M. B. C. (2006). The role of therapist adherence, therapist competence, and alliance in predicting outcome of individual drug counseling: Results from the national institute drug abuse collaborative cocaine treatment study. *Psychotherapy Research*, 16(2), 229-240.
- Barrowclough, C., Meier, P., Beardmore, R., & Emsley, R. (2010). Predicting therapeutic alliance in clients with psychosis and substance misuse. *The Journal of Nervous and Mental Disease*, 198(5), 373.

- Belding, M.A., Iguchi, M.Y., Morral, A.R., & McLellan, A.T. (1997). Assessing the helping alliance and its impact in the treatment of opiate dependence. *Drug and Alcohol Dependence*, 48, 51-59.
- Bell, D. C., & Montoya, I. D. (1997). Therapeutic connection and client progress in drug abuse treatment. *Journal of Clinical Psychology*, 53(3), 215-224.
- Bethea, A. R., Acosta, M. C., & Haller, D. L. (2008). Patient versus therapist alliance: Whose perception matters? *Journal of Substance Abuse Treatment*, 35(2), 174-183.
- Bordin, E.S. (1975, August). The Working Alliance: Basis for a general theory of psychotherapy. Paper presented at the meeting of the Society for Psychotherapy Research, Washington, DC.
- Bordin, E.S. (1980, June). *Of human bonds that bind or free*. Paper presented at the Society for Psychotherapy Research, Pacific Grove, CA.
- Borsari B., & Carey K.B. (2000). Effects of a brief motivational intervention with college student drinkers. *Journal of Consulting and Clinical Psychology*, 68, 728-733.
- Carroll, K. M., & Nich, C. (1997). Contribution of the therapeutic alliance to outcome in active versus control psychotherapies. *Journal of Consulting & Clinical Psychology*, 65(3), 510.
- Connors, G. J., & DiClemente, C. C. (2000). Predicting the therapeutic alliance in alcoholism treatment. *Journal of Studies on Alcohol*, 61(1), 139.
- Connors, G. J., & Donovan, D. M. (1997). The therapeutic alliance and its relationship to alcoholism treatment participation and outcome. *Journal of Consulting & Clinical Psychology*, 65(4), 588.
- Cooper, A. M., Sobell, M. B., Sobell, L. C., & Maisto, S. A. (1981). Validity of alcoholics' self-reports: Duration data. *International Journal of the Addictions*, 16, 401-406.
- Culbreth, J.R. (2000). Substance abuse counselors with and without a personal history of chemical dependency: A review of the literature. *Alcoholism Treatment Quarterly*, 18, 67-82.
- Davidson, D., Gulliver, S. B., Longabaugh, R., Wirtz, P. W., & Swift, R. (2007a). Building better cognitive-behavioral therapy: Is broad-spectrum treatment more effective than motivational-enhancement therapy for alcohol-dependent patients treated with naltrexone? *Journal of Studies on Alcohol & Drugs*, 68(2), 238-247.
- Davidson, D., Wirtz, P. W., Gulliver, S. B., & Longabaugh, R. (2007b). Naltrexone's suppressant effects on drinking are limited to the first 3 months of treatment. *Psychopharmacology*, 194(1), 1-10.



- De Weert-Van Oene, G. H., Schippers, G. M., De Jong, C. A. J., & Schrijvers, G. J. P. (2001). Retention in substance dependence treatment: The relevance of in-treatment factors. *Journal of Substance Abuse Treatment, 20*(4), 253-261.
- Eames, V., & Roth, A. (2000). Patient attachment orientation and the early working alliance-A study of patient and therapist reports of alliance quality and ruptures. *Psychotherapy Research, 10*(4), 421-432.
- Fenton, L.R., Cecero, J.J., Nich, C., Frankforter, T.L. & Carroll, K.M. (2001). Perspective is everything: the predictive validity of six working alliance instruments. *Journal of Psychotherapy Practice and Research, 10*, 262-268.
- Finney, J. W., Wilbourne, P. L., & Moos, R. H. (2007). Psychosocial treatment for substance use disorders. In P. E. Nathan, & J. M. Gorman (Eds.), *A guide to treatments that work* (3rd ed., pp. 179). New York: Oxford University Press.
- Gelso, C.J., Carter, J.A. (1985). The relationship in counseling and psychotherapy: components, consequences, and theoretical antecedents. *The Counseling Psychologist, 13*, 155-243.
- Gloaguen, V., Cottraux, J., Cucherat, M., & Blackburn, I.M. (1998). A meta-analysis of the effects of cognitive therapy in depressed patients. *Journal of Affective Disorders, 49*, 59-72.
- Graham, J. M., Liu, Y. L. J., & Jeziorski, J. L. (2006). The Dyadic Adjustment Scale: A reliability generalization meta-analysis. *Journal of Marriage and Family, 68*, 707-717.
- Greenson, R. R. (1965). The working alliance and transference neurosis. *Psychoanalytic Quarterly, 34*, 155.
- Gueorguieva, R., Wu, R., Donovan, D., Rounsaville, B.J., Couper, D., Krystal, J.H., O'Malley, S.S. (2010). Baseline trajectories of drinking moderate acamprosate and naltrexone effects in the COMBINE study. *Alcoholism: Clinical and Experimental Research, 10*, 231-244.
- Gulliver, S. B., Longabaugh, R., Davidson, D., & Swift, R. (2005). The development of a broad spectrum treatment for patients with alcohol dependence in early recovery. *Cognitive and Behavioral Practice, 12*, 53.
- Haaga, D. A., Hall, S. M., & Hass, A. (2006). Participant factors in treating substance use disorders. In L. G. Castonguay, & L. E. Beutler (Eds.), *Principles of therapeutic change that work* (pp. 275). New York: Oxford.
- Henry, W. P., & Strupp, H. H. (1994). The therapeutic alliance as interpersonal process. In A. O. Horvath, & L. S. Greenberg (Eds.), *The working alliance: Theory, research, and practice* (pp. 51). Canada: John Wiley & Sons.

- Horvath, A.O., & Greenberg, L.S. (1986). Development of the working alliance inventory. In L.S. Greenberg & W.M. Pinsof (Eds.), *The psychotherapeutic process: A research handbook* (pp. 529-556). New York: Guilford.
- Horvath, A. O., & Symonds, B. D. (1991). Relation between working alliance and outcome in psychotherapy: A meta-analysis. *Journal of Counseling Psychology*, 38(2), 139.
- Hubbard, R.L., Craddock, G.S., Anderson, J. (2003). Overview of 5-year follow-up outcomes in the drug abuse treatment outcome studies (DATOS) *Journal of Substance Abuse Treatment*, 25(3), 125-134.
- Joe, G. W., Simpson, D. D., Dansereau, D. F., & Rowan-Szal, G. A. (2001). Relationships between counseling rapport and drug abuse treatment outcomes. *Psychiatric Services*, 52, 1223.
- Kokotovic, A. M., & Tracey, T. J. (1990). Working alliance in the early phase of counseling. *Journal of Counseling Psychology*, 37(1), 16-21.
- Lambert, M. J., & Barley, D. E. (2002). Reserach summary on the therapeutic relationship and psychotherapy outcome. In J. C. Norcross (Ed.), *Psychotherapy relationships that work* (pp. 17). New York: Oxford.
- Lipsey, M. W., & Wilson, D. B. (1993). The efficacy of psychological, educational, and behavioral treatment. *American Psychologist*, 48, 1181-1201.
- Longabaugh, R., Wirtz, P. W., Gulliver, S., & Davidson, D. (2009). Extended naltrexone and broad spectrum treatment or motivational enhancement therapy. *Psychopharmacology*, 206(3), 367-376.
- Luborsky, L. (1994). Therapeutic alliance measures as predictors of future benefits of psychotherapy. In A.O. Horvath & L.S. Greenberg (Eds.), *The working alliance: Theory, research and practice*. New York: Wiley.
- Luborsky, L., Barber, J.P., Siqueland, L., McLellan, A.T. & Woddy, G. (1995). Establishing a therapeutic alliance with substance abusers. In: Onken, L.S., Blaine, J. & Boren, J. J., eds. *Beyond the Therapeutic Alliance: Keeping the Drug-Dependent Individual in Treatment*, p. 165. Rockville, MD: National Institute on Drug Abuse.
- Maisto, S. A., Sobell, L. C., Cooper, A. M., & Sobell, M. B. (1982). Comparison of two techniques toobtain retrospective reports of drinking behaviorfrom alcohol abusers. *Addictive Behaviors*, 7, 33-38.
- Maisto, S. A., Sobell, L. C., & Sobell, M. B. (1979).Comparison of alcoholics' self-reports of drinking behavior with reports of collateral informants. *Journal of Consulting and Clinical Psychology*, 47,106-122.

- Maisto, S. A., Sobell, M. B., Cooper, A. M., & Sobell, L. C. (1979). Test-retest reliability of retrospective self-reports in three populations of alcohol abusers. *Journal of Behavioral Assessment, 1*, 315-326.
- Mallinckrodt, B. (1995) Attachment theory and counseling psychology: ready to be a prime time player? *Counseling Psychologist, 23*, 501-505.
- Mallinckrodt, B. (2000). Attachment, social competencies, social support, and interpersonal process in psychotherapy. *Psychotherapy Research, 10*(3), 239-252.
- Marlatt, G.A., Larimer, M.E., Baer, J.S. & Quigley, L.A. (1993). Harm reduction for alcohol problems: moving beyond the controlled drinking controversy. *Behavior Therapy, 24*, 461–504.
- Martin, D. J., & Garske, J. P. (2000). Relation of the therapeutic alliance with outcome and other variables: A meta-analytic review. *Journal of Consulting & Clinical Psychology, 68*(3), 438-451.
- McCrary, B.S., Nathan, P.E., 2006. Treatment factors in treating substance use disorders. In: Castonguay, L.B., Beutler, L.E. (Eds.), *Principles of Therapeutic Change that Work*. Oxford, New York, pp. 319–340.
- MacKinnon, D. P., Lockwood, C. M., & Williams, J. (2004). Confidence limits for the indirect effect: Distribution of the product and resampling methods. *Multivariate Behavioral Research, 39*(1), 99-128.
- McLellan, A.T., Woody, G.E., Luborsky, L. and Groehl, L., (1988). Is the counselor an “active ingredient” in substance abuse rehabilitation? An examination of treatment success among four counselors. *Journal of Nervous and Mental Disorder, 176*, 423–430.
- Meier, P. S., Barrowclough, C., & Donmall, M. C. (2005). The role of the therapeutic alliance in the treatment of substance misuse: A critical review of the literature. *Addiction, 100*(3), 304-316.
- Miller, W.R., Leckman, A.L., Delaney, H.D., Tinkcom, M. (1992). Long-term follow-up of behavioral self-control training. *Journal of Alcohol Studies, 53*(3), 249-61.
- Miller, I.W., Epstein, N.B., Bishop, D.S., & Keitner, G.I. (1985). The McMaster Family Assessment Device: reliability and validity. *Journal of Marital and Family Therapy, 11*, 345-356.
- Miller, W.R., & Rollnick, S. (2002). *Motivational Interviewing: Preparing People for Change*, Vol. 2. New York: Guilford

- Miller, W.R., Benefield, R.G., & Tonigan, J.S. (1993). Enhancing motivation for change in problem drinking: a controlled comparison of two therapist styles. *Journal of Consulting and Clinical Psychology*, 61, 455–461.
- Moos, R. H. (2003). Addictive disorders in context: Principles and puzzles of effective treatment and recovery. *Psychology of Addictive Behaviors*, 17(1), 3-12.
- Moras, K. & Strupp, H.H. (1982) Pretherapy interpersonal relations, patients' alliance, and outcome in brief therapy. *Archives of General Psychiatry*, 39, 405-409.
- Najavits, L. M., & Weiss, R. D. (1994). Variations in therapist effectiveness in the treatment of patients with substance use disorders: An empirical review. *Addiction*, 89(6), 679-688.
- National Institute on Alcohol Abuse and Alcoholism (2000). *10th Special Report to the U.S. Congress on Alcohol and Health*. NIH Publication No. 00-1583. Rockville, MD: U.S. Department of Health and Human Services, ch. 6.
- Nestler, E.J., Hyman, S.E., & Malenka, R.C. (2008). *Molecular Neuropharmacology: A Foundation for Molecular Neuroscience*. New York: McGraw-Hill Professional.
- O'Farrell, T. J., Cutter, H. S. G., Bayog, R. D., Dentch, G., & Fortgang, J. (1984). Correspondence between one-year retrospective reports of pretreatment drinking by alcoholics and their wives. *Behavioral Assessment*, 6, 263-274.
- O'Malley, S.S., Jaffe, A.J., Chang, G, Schottenfeld, R.S., Meyer R.E., Rounsaville, B. (1992). Naltrexone and coping skills therapy for alcohol dependence. A controlled study. *Archives of General Psychiatry* 46, 881-887.
- Petry, N. M., & Bickel, W. K. (1999). Therapeutic alliance and psychiatric severity as predictors of completion of treatment for opioid dependence. *Psychiatric Services*, 50, 219.
- Project Match Research Group. (1997). Matching alcoholism treatments to client heterogeneity: Project MATCH Posttreatment drinking outcomes. *Journal of Studies on Alcohol*, 58(1), 7-29.
- Shadish, W.R., Matt, G.E., Navarro, A.M., & Phillips, G. (2000). Revisiting the effects of psychological therapies in clinically representative conditions: A meta-analysis. *Psychological Bulletin*, 126, 512-529.
- Spanier, G. B. (1976). Measuring dyadic adjustment: New scales for assessing the quality of marriage and similar dyads. *Journal of Marriage and Family*, 38(1), 15-28.
- Tichenor, V., & Hill, C.E. (1989). A comparison of six measures of working alliance. *Psychotherapy: Theory, Research, and Practice*, 26, 195-199.

Zywiak, W.H., Neighbors, C.J., Martin, R.A., Johnson, J.E., Easton, C.A., Rohsenow, D.J. (2009). *Journal of Substance Abuse Treatment*, 36(3), 321-330.