

THE ROLE OF THERAPEUTIC ALLIANCE IN INDIVIDUAL AND COUPLE  
COGNITIVE-BEHAVIORAL THERAPY FOR WOMEN WITH ALCHOL  
DEPENDENCE

by

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## ABSTRACT OF THE DISSERTATION

### The Role of Therapeutic Alliance in Individual and Couples Cognitive-Behavioral Therapy for Women with Alcohol Dependence

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The construct of therapeutic alliance has yet to be investigated among women participating in treatment for alcohol dependence. The current study examined predictors of the formation of alliance and its relationship with treatment outcome within individual and couples cognitive-behavioral therapy. It also developed a new, observer-rated measure of alliance and tested the psychometric properties of this instrument (Treatment Integrity Rating Scale Alliance-Related Items [TIRS-ARI]). Participants were 158 women with an alcohol use disorder (98% alcohol dependence) treated in a 12-session randomized clinical trial either with or without their male partner. Participants were not randomized to study arm (i.e., Individual/Couples), therefore all analyses were conducted separately for the Full, Individual Arm, and Couples Arm Samples. Data were collected at baseline and 3-, 9-, and 15-months post-baseline (003, 009, 015), and relevant variables included: motivation (SOCRATES [SOC], choice of abstinence goal), alliance (Working Alliance Inventory [WAI], TIRS-ARI), alcohol consumption (percent days abstinent [PDA]), and relationship functioning (Dyadic Adjustment Scale [DAS]). Results

indicated that the new measure of alliance created for the current study (TIRS-ARI) exhibited adequate psychometric properties and was appropriate for use in conjunction with the WAI. Predictor analyses indicated that greater motivation was associated the formation of stronger alliances in individual, but not couples, therapy; women who chose an abstinence goal (an index of motivation) formed stronger alliances as measured by the WAI and TIRS-ARI in the Full Sample and by the WAI in the Individual Sample than those who chose a non-abstinence goal. In multiple regression predictor analyses, motivation (SOC Problem Recognition subscale) was found to be significantly associated with WAI among participants in the Individual Arm Sample. Additional treatment modalities differences indicated that women in the Individual Arm of the clinical trial formed significantly stronger alliances as measured by the WAI than women in the Couples Arm. Treatment outcome analyses found that alliance was predictive of both alcohol consumption and relationship functioning during follow up when controlling for baseline values of outcome variables. Higher scores on the WAI were associated with greater PDA at 009 in the Full and Individual Arm Samples and at 015 in the Individual Arm Sample. Among Couples Arm participants, higher scores on the WAI and TIRS-ARI were associated with greater relationship functioning (DAS) at 009 and 015, respectively. Overall, patterns of alliance formation and predictive utility differed between the Individual and Couples Arms, and the current study concludes with a discussion of the clinical implications of these identified patterns.

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## The Role of Therapeutic Alliance in Individual and Couples Behavioral Therapy for Women with Alcohol Dependence

Therapeutic alliance is an important construct in psychotherapy research. Despite its ubiquitous presence in the therapeutic process, alliance lacks a singular definition and continues to be approached by theorists and clinical researchers from a variety of perspectives. The current paper discusses the origin and development of this construct, explores its conceptualization from predominant theoretical viewpoints, and examines the literature on its relationship with psychotherapy outcome. In addition, this paper reviews methodological issues related to the measurement of alliance, as well as patient and therapist variables that impact its formation and trajectory over the course of treatment.

Upon providing a comprehensive analysis of the construct of alliance, the current paper goes on to discuss its application within the domains of substance abuse treatment and couples therapy. This review also considers gender-specific facets of alliance within the context psychotherapy for women. These discussions serve to introduce the rationale for the current study: the role of therapeutic alliance has yet to be investigated within individual and couples treatment for women with alcohol dependence. The current study sought to fill this gap in the therapeutic alliance literature.

### *History*

Freud (1912) proposed that a key element in the success of analysis is the establishment of an attachment of the patient to the therapist. He suggested that this attachment is based on the analyst's venture to appeal to the inner analyst residing within the patient and on the collaboration between therapist and patient against the latter's neuroses. The development of a patient's positive and affectionate feelings toward the analyst was considered by Freud to be a component of positive transference, one that

results from projections arising from past relationships. Whereas other facets of transference were hypothesized to operate in the absence of the patient's conscious awareness, Freud asserted that this positive attachment was uniquely admissible to consciousness and served to bolster the patient's engagement in the therapeutic process.

While Freud was perhaps the first author to recognize the importance of this construct, the term therapeutic alliance was not introduced into the psychotherapy literature until 1956. Also referring to the positive affectionate attachment to the therapist, Zetzel (1956) suggested that the formation of alliance depends upon the nature of early developmental experiences and the patient's subsequent capacity to engage in stable, trusting relationships. In cases where this trusting relationship does not emerge in therapy, she recommended that transference interpretations and other psychodynamic interventions be postponed and that the analyst focus exclusively on creating a supportive environment.

Zetzel's perspective greatly influenced the work of Greenson (1965), who conceptualized the construct of alliance as consisting of two separate, yet equally important components. Whereas the *therapeutic* alliance in Greenson's account refers to the affective alignment or bond aspect of the relationship, he introduced the term *working* alliance to distinguish the aspect of the relationship that catalyzes meaningful and productive work within treatment. Together, the therapeutic and working alliances were considered by Greenson to exist independently of transference reactions within the patient. This theoretical separation represents a divergence from prior thinking, as both Freud and Zetzel considered the alliance directly linked to positive transference reactions of the patient. Greenson instigated what would become a spirited debate within the psychodynamic literature regarding the interplay, or lack thereof, between the constructs

of alliance and transference (discussed further in the section, *Alliance from the Psychodynamic Perspective*).

Thus far in its development, the construct of alliance had been examined exclusively by psychodynamic theorists and Bordin (1979) was the first author to approach the topic from a transtheoretical perspective. He proposed a tripartite model of alliance, consisting of: (a) the agreement between patient and therapist on the *goals* of treatment, (b) the degree of concordance regarding the *tasks* pertinent to accomplishing these goals, and (c) the emotional *bond* between the patient and therapist. In regard to goals, Bordin suggested that careful articulation of therapeutic aims that accommodate the individual needs of the patient and address the patient's particular concerns is essential to the success of therapy. Bordin proposed that the process of negotiating these goals is of primary significance to the patient's perception of the therapist as understanding and helpful. While the goals prescribe the direction the therapy will take, the tasks are "the specific activities that the partnership will engage in to instigate or facilitate change" (Bordin, 1979, p. 16). Involving patients in the generation of treatment strategies and soliciting their input in the development of the therapeutic roadmap was believed to engender a sense of mutual collaboration. It is this feeling of collaboration, Bordin claimed, that serves as the foundation of the emotional bond between patient and therapist. Diverging from prior conceptualizations of the development of the therapeutic bond, Bordin uniquely tied this emotional connection to non-affectively-laden elements of treatment (i.e., collaborative agreement on goals and tasks).

Following Bordin's (1979) tripartite model, Luborsky (1984) was the next major theorist to contribute to the alliance literature. Working from a psychodynamic perspective, Luborsky coined the term "*helping alliance*" and suggested that five key

phenomena experienced by patients facilitate its formation: (a) experiencing the therapist as being warm and supportive, (b) perceiving the therapist as being helpful, (c) feeling that one's values are respected by the therapist, (d) believing that change is possible, and (e) believing that treatment is capable of producing this change. These variables constituted what Luborsky termed Type I alliance, or the patient's experience of the therapist as providing the help that is needed. Type II alliance, on the other hand, referred to the patient's experience of treatment as a process of working together with the therapist toward the goals of treatment. Thus, Luborsky's perspective contains an emphasis on emotional bond and collaboration similar to that of prior conceptualizations; however, it also includes what could be considered from a more cognitive perspective to be elements of positive expectancy regarding the potential utility of treatment.

Finally, Gaston (1990) approached the construct from an integrative psychodynamic perspective and suggested that alliance is a multidimensional construct consisting of four relatively independent elements: (a) the patient's capacity to work purposefully in therapy, (b) the patient's affective bond with the therapist, (c) the therapist's empathic understanding and involvement, and (d) the agreement between patient and therapist on the goals and tasks of treatment. As will be seen in the forthcoming discussion regarding the measurement of alliance, Gaston's transtheoretical definition, along with that put forth by Bordin, served as the theoretical foundation of psychometric instruments that have been widely used in clinical research. Prior to a discussion of assessment-related issues, however, a review of alliance as conceived by the major theoretical orientations, including psychodynamic, experiential/humanistic, and cognitive-behavioral, is provided.

#### *Alliance from the Psychodynamic Perspective*

Considering that early writing was dominated by psychodynamic theorists, the above review provides a good introduction to the psychodynamic perspective of alliance. However, it should be noted that the “psychodynamic perspective” is by no means a unified theory; indeed, this perspective contains a multitude of viewpoints, some complimentary and others conflicting. Therefore, the aim of the current discussion is not to present the psychodynamic perspective per se, but instead to review conceptualizations of therapeutic alliance that fall under the rubric of psychodynamic theory.

The point of greatest contention among psychodynamic theorists regarding the therapeutic alliance is its relation to transference (Saketopoulou, 1999). As a point of clarification, transference is defined as the process by which the patient unconsciously transfers feelings and attitudes associated with prior significant relationships (e.g., with a parent) to the relationship with the therapist (Meissner, 2006). Countertransference is the related process by which the therapist responds to the patient’s transference in a way that evokes feelings associated with prior relationships in the therapist’s life. Together, these interacting phenomena represent fundamental characteristics of the patient-therapist relationship and their exploration within treatment is considered central to the work of dynamic therapies (Crits-Cristoph & Connolly, 2003). Alliance has been purported by various psychodynamic theorists to be embedded within transference, to exist independently of transference, and to not exist at all.

This last claim has been advanced by psychodynamic “purists” who maintain that no aspect of the dyadic relationship is devoid of transferential loading. For example, Deserno (1998) wrote that transference is omnipresent and that the patient’s ability, or lack thereof, to perceive the therapist as helpful (i.e., a component of many definitions of the alliance) is itself a manifestation of transference. He went on to assert that even

acknowledging the construct of alliance has a deleterious effect on treatment insofar as it may derail the therapist's focus on the primary aim of therapy, the interpretation of the patient's transference reactions.

Among those theorists who consider alliance to be a unique component of transference, it is argued that emotions and thoughts associated with unresolved relationships with significant others are bound to be displaced (i.e., transferred) onto the relationship with the therapist (Gelso & Carter, 1985). As a result, the therapeutic relationship is characterized by a misperception or misinterpretation of the therapist by the patient and is, therefore, an *unreal* relationship. Proponents of this view maintain that the therapeutic alliance is based on the current status of the patient's transference reactions (i.e., positive versus negative) and that these reactions are dictated by the patient's unconscious projections. A strong therapeutic alliance (i.e., a sense of collaboration and trust between patient and therapist) may indeed emerge and even facilitate treatment when present, but is characteristically unstable and fluctuates with the vacillations of the patient's transference reactions. Therefore, the status of the therapeutic alliance is entirely dictated by the transference.

The final take on this controversy, that alliance exists as a construct distinct from transference, is put forth by Meissner (2006) who argues that while they do occur simultaneously with ongoing mutual interaction, these two aspects of the therapeutic relationship are clearly discriminable and serve different functions. Meissner conceptualizes the alliance as consisting of the realistic "here and now" aspects of the working relationship that are forged through collaboration and mutual agreement on goals and tasks. These reality-based elements of the relationship provide the context within which effective interventions and interpretations may take place and also protect against

early termination. If a patient's transference reactions become too intense without a stable, trusting alliance in place, the patient is likely to drop out. Thus, it is the therapeutic alliance that allows the real work of therapy, interpretation of transference, to take place.

*Alliance from the Humanistic/Experiential Perspective*

Rogers (1957) asserted that there are three components of psychotherapy that are necessary and sufficient to produce positive change within patients: empathy, acceptance, and congruence. Serving as the foundation of the humanistic perspective, these three facets of the therapeutic process were believed by Rogers to allow the patient to engage in a facilitative, responsive relationship with the therapist. The first component, empathy, involves the therapist responding in such a way that communicates complete understanding and appreciation for the internal experience of the patient. Acceptance requires that the therapist view the patient with unconditional positive regard and express this belief in a way that validates the patient's thoughts and feelings. Congruence, or the effective processing of emotion, requires that both the patient and therapist be aware of their emotional reactions and symbolize or label these in an effort to more fully understand their nature. Each of these elements should be delivered in a genuine and authentic manner and the therapist should always seek to maintain an "I-thou" relationship with the patient (i.e., one that is balanced and egalitarian; Rogers).

Empathic responding that is accepting and congruent was suggested by Watson (2007) to facilitate the patient's regulation of affect in a number of different ways, including by: (a) fostering patients' awareness of their emotional reactions, (b) helping patients to label and articulate their inner experience and to create a verbal representation of it, (c) internalizing the accepting and nurturing behavior of the therapist, and (d)

cultivating patients' reflective capacity. In addition to promoting affect regulation, Rogers argued that internalization of the therapist's acceptance and positive regard led to the cultivation of similar feelings of worth and value within the patient. Another curative mechanism of the therapeutic bond was believed to be affirmation. The therapist's attunement to and symbolization of the patient's internal experience was suggested to have an affirming effect that both validates the experience and strengthens the patient's sense of self (Watson).

Using these fundamental aspects of the humanistic perspective as its foundation, experiential psychotherapy provides a similar focus on empathy, acceptance, and congruence; however, it contends that these ingredients are necessary but not sufficient to facilitate change (Weersekera, Linder, Greenberg, & Watson, 2001). The primary active ingredient of experiential therapy is that of "experiencing," or the process by which patients focus on their inner experience and symbolically represent it for themselves and their therapist (Greenberg, Rice, & Elliot, 1994). While this process was thought by Rogers to be a by-product of empathic responding, experiential therapists target this phenomenon with more active interventions. As such, experiential theorists acknowledge the importance of agreement between patient and therapist on goals and tasks, and have largely adopted Bordin's (1979) transtheoretical model (Watson & Greenberg, 2000). Therefore, in experiential therapy the therapist seeks to form an empathically-attuned bond with the patient, to formulate clearly the specific cognitive-affective problems that have brought the patient into treatment, and to develop agreement regarding their respective tasks and responsibilities that will facilitate experiential processing.

*Alliance from the Cognitive-Behavioral Perspective*



Current cognitive-behavioral conceptualizations of the construct of alliance have their roots in early writings on the practice of behavior therapy. During the nascent stages of its development, behavior therapy was considered to be minimally impacted by the therapeutic relationship and the therapist was believed to function merely as a “social reinforcement machine” (Krasner, 1962). This characterization of the therapy as being mechanical in nature underscores the emphasis that early behavior therapy placed on technique over the therapeutic relationship. However, as therapists started to apply behavioral techniques in actual clinical practice, the importance of the therapeutic relationship became clear. Unwilling to adopt psychodynamic conceptualizations of the alliance (transference involved inference and lacked observable evidence), behavior therapists quickly aligned themselves with Bordin’s (1979) transtheoretical model upon its introduction. Prior to that point, behaviorally-oriented researchers regarded the relationship as one of a myriad of unobservable, “nonspecific” factors of treatment (Gaston et al., 1995).

With the emergence of cognitive therapy and its partnership with traditional behavioral techniques, cognitive-behavioral researchers continued to acknowledge the importance of the therapeutic alliance in successful treatment. As opposed to the equal-footing of the I-thou relationship espoused by the humanistic/experiential perspective, the role of the therapist in cognitive-behavioral therapy is one of expert (Waddington, 2002). This position, alternatively viewed as being a coach or trainer, must be balanced with expression of empathy and warmth in order to prevent the patient from feeling misunderstood and/or uncared for. Ultimately, while the therapeutic alliance in cognitive-behavioral therapy is not considered to be a curative element of treatment in and of itself, it is believed to serve a variety of facilitative functions (Waddington). For

example, in the early stages of treatment a strong alliance may enhance the patient's sense of hope that meaningful change is possible and bolster positive expectancies regarding the likelihood that treatment will catalyze such change.

A central tenet of the cognitive-behavioral perspective is collaborative empiricism (Beck, Rush, Shaw, & Emery, 1979), or the process by which hypotheses pertaining to the maintenance of maladaptive behaviors and/or cognitions are generated within session and then tested in the patient's natural environment. The patient's willingness to engage in this type of shared exploration is believed to be enhanced when the therapeutic relationship provides a "secure base" from which to explore (Young, Weinberger, & Beck, 2001). Borrowing from attachment theory, Young and colleagues argue that creating a secure base via alliance also enhances compliance with between- and in-session exposure exercises as well as self-monitoring and other forms of homework. Often, such exercises and homework assignments are unpleasant or even aversive, and the presence of a strong therapeutic alliance may serve to increase their tolerability and enhance patient compliance.

Also, from a social influence perspective, when a therapist possesses positive attributes that the patient respects and admires, the therapist's degree of social influence may increase. In fact, there is evidence indicating that when patients perceive their therapist to be expert, trustworthy, and attractive they are more likely to comply with treatment requirements and less likely to drop out of therapy (McNeil, May, & Lee, 1987). This increase in social influence may translate into a related increase in the positive reinforcement value of therapists' encouragement and praise. By enhancing the salience of positively reinforcing statements in this way, the likelihood that patient's follow through with challenging exercises may increase as well. As can be seen from this

review, the cognitive-behavioral perspective views the alliance primarily as a tool that sets the stage for technical interventions and as a facet of treatment that allows more active ingredients of therapeutic change to be implemented.

### *Assessment of the Alliance*

Considering that the various psychometric instruments created to assess the therapeutic alliance are based on different theoretical perspectives and rely on different methodologies for measuring the relationship, the origin and development of each will be reviewed separately.

Of the early alliance measures, one of the most commonly used sets of scales are those developed by Luborsky and colleagues at the University of Pennsylvania (referred to collectively as the Penn scales). The Penn scales were based on Luborsky's (1984) psychodynamic conceptualization of the helping alliance and measured indicators of both Type I and Type II alliance. Early versions of the instrument (i.e., Helping Alliance Counting Signs, HAcS; Penn Helping Alliance Rating Method, HAR) required clinical observers to rate session transcripts or video tapes for patient statements tapping Type I and Type II alliance variables. These observer-rated measures were later adapted into the Helping Alliance Questionnaire (HAQ-II; Luborsky et al., 1996), an 11-item self-report instrument available in both patient- and therapist-rated versions. Together, the Penn scales were the product of a pioneering effort to assess the construct of alliance and served as the benchmark by which subsequent measures would be evaluated.

Strupp and colleagues at Vanderbilt University developed a series of instruments (known as the Vanderbilt scales) that reflected a combination of psychodynamic and integrative conceptualizations of the alliance that drew from the theories of Bordin (1979), Greenson (1965), and Luborsky (1984). Designed to assess both the positive and

negative aspects of the patient's and therapist's behavior and attitudes believed to impact therapeutic progress, the Vanderbilt Psychotherapy Process Scale (VPPS; Gomes-Schwartz, 1978) is an 80-item observer-rated measure of the alliance. Considering that the subsequent 44-item Vanderbilt Therapeutic Alliance Scale (VTAS; Hartley & Strupp, 1983) has evidenced a similar factor structure as the VPPS (Hartley & Strupp), this shorter measure has become the preferred instrument between the two.

Another series of instruments based on the integration of psychodynamic conceptualizations of the alliance and Bordin's (1979) transtheoretical model were created by Marziali and colleagues at the University of Toronto (known as the Toronto scales). In addition to generating items based on theoretical conceptualizations of the alliance (e.g., Bordin, 1979; Luborsky, 1984), Marziali selected items from existing scales (e.g., VPPS, VTAS, and HAcS) in creating the Therapeutic Alliance Rating Scale (TARS; Marziali, Marmar, & Krupnick, 1981). A 42-item instrument, The TARS allowed nonparticipant observers to evaluate the positive and negative aspects of both therapist and patient behavior (21 items each). Later, Marziali (1984) created patient- and therapist-rated versions of the TARS by rewording the original observer-rated version of the scale (TARS-P, TARS-T).

Perhaps the most widely used alliance assessment instrument in clinical research is the Working Alliance Inventory (WAI; Horvath & Greenberg, 1986). Horvath and his colleagues created this measure in an effort to achieve three goals: (a) to measure alliance factors across all types of therapy, (b) to document the relationship between the alliance measure and the theoretical constructs underlying the measure, and (c) to connect the alliance measure to a general theory of therapeutic change (Horvath & Greenberg). Toward the first aim of developing a measure appropriate for treatments of various

theoretical orientations, the WAI was based on Bordin's (1979) transtheoretical model and was designed to specifically assess the model's three hypothesized components: agreement on goals, agreement on tasks, and emotional bond. Each of these components is assessed in its own WAI subscale, yielding separate scores that can be interpreted independently or combined to quantify the degree of global therapeutic alliance. Not only is the WAI available in observer-, patient-, and therapist-rated versions, it has also been adapted into a short-form as well (Tracey & Kokotovic, 1989). Busseri and Tyler (2003) provided evidence of the interchangeability of this short-form with the longer, 36-item WAI and showed that both versions exhibit strong internal consistency and inter-rater reliability as well as predictive validity.

Another instrument of choice among researchers interested in assessing the alliance in psychotherapy outcome studies is the California Psychotherapy Alliance Scale (CALPAS; Marmar, Weiss, & Gaston, 1989). A 24-item instrument, the CALPAS is divided into subscales measuring the four dimensions of alliance as conceptualized by Gaston (1990): (a) the Patient Working Capacity scale measures the patient's ability to work purposefully in therapy, (b) the Patient Attachment scale measures the patient's affective attachment to the therapist, (c) the Therapist Understanding and Involvement scale measures the therapist's empathy and emotional engagement, and (d) the Working Strategy Consensus scale measures the agreement between patient and therapist on the goals and tasks of treatment. Although Gaston writes from a primarily psychodynamic perspective, his incorporation of patient working capacity as well patient/therapist agreement on goals and tasks acknowledges the importance of these transtheoretical facets of alliance. Similar to the WAI, the CALPAS is available in observer-, patient-, and therapist-rated versions.

The final alliance measure to be discussed is the Therapeutic Bond Scale developed by Saunders and colleagues (TBS; Saunders et al., 1989). While the majority of instruments discussed thus far either were created as observer-rated instruments subsequently adapted into patient- and therapist-rated versions or were designed from the outset to assess alliance from all three perspectives, the TBS is the only instrument to measure alliance exclusively from the patient's vantage point. Based on the 'generic model' of psychotherapy (Orlinsky & Howard, 1986), the TBS is a 50-item self-report instrument divided into subscales assessing the three components of alliance as conceptualized by Orlinsky & Howard: working alliance, empathic resonance, and mutual affirmation. When using the TBS, patient's rate their subjective experience of a particular therapy session using a 21-point Likert-type scale.

#### *Comparative Psychometrics*

Psychometric evaluations comparing various alliance instruments have found that, on a global level, generous overlap exists between measures. Tichenor and Hill (1989) investigated the relation between four observer-rated instruments (HAr, VTAS, CALPAS, and WAI) and found that shared variance among the measures' total scores ranged from 56%-71%. Similarly, when comparing the patient-rated versions of the CALPAS and WAI, Safran and Wallner (1991) observed that the two measures shared 76% of the variance in total scores. While both of these studies found that total scores covaried significantly between measures, this overlap did not consistently extend to comparisons of individual subscales (i.e., shared variance ranged from 0%-67%; Safran & Wallner; Tichenor & Hill). Upon consideration, these findings are intuitive considering that most instruments attempt to capture distinct components of the alliance with separate subscales embedded in the measure. Overlap among these independent underlying components,

therefore, would only be expected between subscales tapping similar aspects of the construct. This contention is supported by additional evidence of a wide range of correlations between subscale scores (i.e., 0%-64% between patient- and therapist-rated versions of the HAq, VPPS, and TARS; Bachelor, 1991).

In addition to evidence of similarity in total score variance between measures, a comparison of the psychometric data reported by original study authors indicates that all of the alliance measures evidence adequate internal consistency, inter-rater reliability, and construct validity (HAq, Luborsky et al., 1985; TARS, Marziali, Marmar, & Krupnick, 1981; TBS, Saunders et al., 1989; VTAS, Hartley & Strupp, 1983; WAI, Horvath & Greenberg, 1986). In an independent comparison of the observer-rated versions of the CALPAS, HAq, VTAS and the observer-, patient-, and therapist-rated versions of the WAI, Cecero and colleagues (2001) found that all measures evidenced high internal consistency (i.e., coefficient alphas ranging from .77 to .98) and that all observer-rated measures evidenced high inter-rater reliability (intraclass correlation coefficients ranging from .68 to .81). A separate investigation of the predictive validity of these measures was conducted by Fenton and colleagues (2001) using the same dataset. This study found that total scores on each of the observer-rated instruments and the patient-rated version of the WAI evidenced significant, positive correlations with measures of psychotherapy treatment outcome. However, in this sample of substance abusing participants, scores on the therapist-rated version of the WAI were not found to be predictive of treatment outcome.

This last finding is consistent with other data regarding the predictive validity of alliance instruments. Horvath and Luborsky (1993) conducted a comprehensive review of alliance measures and found that across all instruments, therapists' alliance scales have

provided significantly poorer predictions of treatment outcome than observers' or patients' assessments. Although Horvath and Luborsky suggest a variety of possible explanations for the consistently poor predictive validity of therapist-rated measures (e.g., the impact of countertransference), their hypotheses remain speculative. Since the time of this article's publication, additional evidence has emerged indicating that therapists tend to rate the alliance less favorably than their patients, regardless of treatment type and alliance instrument (Tryon, Blackwell, & Hammel, 2007). In their meta-analysis of patient/therapist divergence in alliance ratings, Tyron and colleagues found a mean difference of  $d = .63$  ( $SD = .42$ ) with patients rating the therapeutic alliance significantly higher than their therapists (i.e., a medium to large effect size; Cohen, 1992).

Additional research is needed to better understand the factors that influence therapists' perception of the alliance, or lack thereof, and to identify the most valid and reliable means of assessing their viewpoint. These steps are essential for more effective use of the alliance construct in psychotherapy research. Having reviewed the psychometric instruments used to assess alliance and discussed the challenges associated with measurement of this construct, the current discussion will now turn to the development and trajectory of alliance within treatment.

#### *Development and Course*

Ample research investigating patient and therapist variables impacting the formation of alliance has been conducted to date and their key findings warrant review. Using factor analytic techniques, Henry and Strupp (1994) identified three categories of patient characteristics that have been shown to affect the development of alliance: interpersonal capacities or skills, intrapersonal attributes, and diagnostic features. While the interpersonal category includes variables such as the quality of patient's social and



familial relationships, the intrapersonal category is comprised of characteristics such as motivation, hopefulness, and quality of object relations. Diagnostic features refer to the severity of psychopathology symptoms upon treatment entry. After weighting results of studies examining these variables by sample size, Henry and Strupp found mean correlation coefficients of .32 and .30 between ratings of the quality of alliance and interpersonal and intrapersonal patient variables, respectively. Thus, patient deficits in interpersonal skills and/or the possession of negative intrapersonal characteristics are associated with significantly poorer ratings of alliance. Diagnostic features, however, were not found to be associated with such ratings, leading Henry and Strupp to conclude that high symptom severity need not necessarily impede the formation of therapeutic alliance. This early categorization of patient variables and evidence of their differential impact on alliance are consistent with more recent data examining the development of the alliance within treatment (e.g., Hillard, Henry, & Strupp, 2000).

In addition to patient attributes, therapist characteristics and techniques have also been found to influence the formation of alliance. Ackerman and Hilsenroth (2003) reviewed 25 articles published between 1988 and 2000 and identified numerous therapist attributes that have been found to be positively correlated with the creation of strong alliances, including being flexible, experienced, honest, respectful, trustworthy, confident, interested, alert, friendly, warm, and open. Among therapist techniques significantly associated with positive ratings of alliance are reflective listening, exploration of emotion, provision of support, reference to past therapy sessions, noting prior therapeutic successes, making accurate psychodynamic interpretations, facilitation of the expression of affect, and attending to patient's experience within session.

While these characteristics and in-session techniques are able to predict the formation of strong therapeutic alliance, Ackerman and Hilsenroth (2002) in a separate study also identified therapist variables that may *negatively* impact its development. Reviewing the same articles as above, the authors found that failure to establish an adequate alliance was associated with therapist attributes such as being rigid, uncertain, exploitive, critical, distant, tense, aloof, and distracted. Therapist techniques found to have a similar inverse relationship with alliance include under- or over-structuring the therapy session, engaging in inappropriate self-disclosure, interpreting transference in an unyielding fashion, and withholding comments in an effort to utilize silence. It appears, therefore, that particular therapist techniques are either prescribed (e.g., reflective listening) or proscribed (e.g., over-structuring) when attempting to forge the therapeutic alliance. Additional research investigating the possible interaction of patient and therapist attributes in the formation of alliance is needed and may have implications for the creation of patient/therapist matching guidelines.

In addition to exploring variables that impact the formation of alliance, researchers have been interested in characterizing the temporal patterns of its development over the course of treatment. To identify such patterns, Kivlighan and Shaghnessy (2000) used cluster analysis, a multivariate statistical technique that forms homogenous groups on the basis of their similarity on a set of pre-specified variables. This study established three patterns of alliance development: stable alliance, linear growth, and quadratic growth. While approximately 70% of their sample reported alliance that did not change or steadily increased over time (i.e., stable alliance and linear growth, respectively), the authors found that the remaining patients evidenced a U-shaped profile (i.e., quadratic), one characterized by a “high-low-high” pattern of alliance.

The nature of this quadratic pattern was further explored by Stiles and colleagues (2004) using a larger sample and a greater number of therapy sessions. This study found that the quadratic pattern more closely resembled a V-shaped, rather than a U-shaped, profile and was characterized by sudden ruptures in the alliance that were followed by their gradual repair. Evidence of this trajectory empirically confirms the existence of the widely observed clinical phenomenon of brief rupture-repair sequences and sets the stage for testing of the “rupture-repair hypothesis” (Safran, 1993; Safran & Muran, 1996). This hypothesis asserts that the break-down of alliance and its subsequent re-creation together represent a process that is itself therapeutic and improves outcome. This and other aspects of the alliance/outcome relationship are discussed next.

#### *Therapeutic Alliance/Treatment Outcome Relationship*

Over the past three decades, there has been a demonstrable increase in both the number of empirical investigations of therapeutic alliance and the breadth of issues covered by these studies. This increase is due, in part, to the consistent lack of differences found in the efficacy of psychotherapy between orientations and to the subsequent interest in common factors (e.g., therapeutic alliance) among therapies that can be used to explain therapeutic outcomes. Such an abundance of research examining the relationship between alliance and treatment outcome exists that meta-analytic techniques have been employed to synthesize their findings. The first such investigation was conducted by Horvath and Symonds (1991) who examined 24 studies of individual psychotherapy published between 1979 and 1990 that included a quantifiable measure of the relationship between the alliance and treatment outcome. As the analyses used in this area of research are typically reported as correlations between alliance and outcome, effect size was estimated using product-moment correlation coefficients. Having

combined the effect sizes for all of the data and calculated an overall weighted value, Horvath and Symonds found an average effect size of  $r = .26$ . This effect represents a statistically significant relationship between alliance and outcome, such that greater therapeutic alliance is associated with better treatment outcome.

Considering that an additional 60 studies meeting Horvath and Symonds (1991) inclusion criteria were published between 1990 and 1999, Martin and colleagues (2000) found that a second meta-analytic evaluation was needed. Using identical coding and statistical techniques as Horvath and Symonds, Martin and colleagues found an average effect size of  $r = .24$  for the relationship between alliance and treatment outcome. While slightly smaller in magnitude than that found previously, this effect provides further evidence of the strong association between therapeutic alliance and treatment outcome. However, Martin and colleagues note that the actual influence of the alliance may be greater than reported because the calculations used in these meta-analyses were based on the cautious assumption that all relations observed but not reported in the original studies, or reported as nonsignificant, were actually  $r = 0$ . This is likely an overly pessimistic assumption, resulting in an underestimation of the actual effect size.

With evidence of a robust association between the quality of therapeutic alliance and subsequent treatment outcome, researchers have attempted to better understand this relationship through analysis of possible moderators. The first and perhaps most obvious question is whether the alliance/outcome relationship is moderated by the theoretical orientation of the treatment being provided. Overall ratings of alliance have been found to be significantly higher in CBT than in psychodynamic-interpersonal therapy (Raue, Goldfried, and Barkham, 1997) and other evidence indicates that good alliance “sets the stage” for technical interventions more readily in CBT than in psychodynamic (Gaston,

Thompson, Gallagher, Cournoyer, & Gagnon, 1998) and process/experiential (Watson & McMullen, 2005) therapies. Despite these documented between-orientation differences in alliance ratings and their association with implementing technique, the overall relationship between therapeutic alliance and treatment outcome does not appear to be moderated by treatment type. Neither of the meta-analyses conducted by Horvath and Symonds (1991) or Martin and colleagues (2000) were able to identify statistically significant differences in alliance/outcome relationships between treatments.

Similarly, when the overall alliance/outcome correlation is disaggregated by length of treatment, type of treatment outcome variable, and outcome rater additional variance is not explained (Horvath & Symonds, 1991; Martin, Garske, & Davis, 2000). The impact of the alliance has been demonstrated in treatments ranging from 4 to over 50 sessions and variation in treatment length does not influence the alliance/outcome relationship. This holds true for variation in outcome variable and rater as well. Regardless of whether outcome is measured by global functioning, quality of life, or specific symptomatology and is assessed by the patient's self-report, therapist report, or objective marker (e.g., urinalysis of drug use), the relationship between therapeutic alliance and treatment outcome remains consistent.

Additional interest has developed in the possible effect that the time of alliance assessment (i.e., early versus late in treatment) has on the predictive utility of its measurement. Several studies that assessed alliance at multiple time points found that early alliance was a more powerful prognosticator of outcome than alliance assessed later in treatment (DeRubeis & Feeley, 1991; Stiles, Agnew-Davies, Hardy, Barkham, & Shapiro, 1998). However, this differential effect may be an artifact of the increased likelihood of rupture-repair sequences occurring in the middle to late phases of treatment

(Kivlighan & Shaughnessy, 2000). Thus, assessments taking place in these later stages may catch alliance immediately prior to, during, or following a rupture, thereby increasing the variability of their reported values and decreasing their predictive utility. This explanation also accounts for discrepancies reported in the alliance/outcome relationship between early assessment and assessments averaged across sessions (e.g., Piper, Azim, Joyce, & McCallum, 1991). To summarize the available data regarding moderators of the alliance/outcome relationship, it seems that few of the hypothesized variables do indeed alter their association.

The final aspect of the relationship between therapeutic alliance and treatment outcome that warrants consideration involves the aforementioned rupture-repair hypothesis. While deterioration in the relationship between patient and therapist may increase the risk of premature termination, some theorists identify breaches of alliance as significant and therapeutic events in the treatment process (Safran & Muran, 1996). They maintain that the timing and nature of the alliance crisis provides useful information that can be utilized in exploring maladaptive interpersonal patterns. The rupture-repair hypothesis would predict that those patients who undergo a rupture-repair sequence will evidence superior treatment outcomes when compared to those patients that have stable or linear growth alliance patterns. In fact, preliminary evidence indicates that this may be the case. Among their sample of depressed adults, Stiles and colleagues (2004) found that individuals whose alliance trajectory met criteria for a rupture-repair sequence (i.e., a statistically significant drop in alliance followed by a return to pre-rupture levels or higher) averaged significantly greater treatment gains as compared to those whose trajectory did not meet criteria. Additional research replicating these findings and further investigating the nature of this phenomenon is needed.

Having reviewed the history of the alliance construct, examined its conceptualization and assessment from different theoretical viewpoints, and investigated the various facets of its relationship with psychotherapy outcome, the current proposal will now examine its application within the domain of substance abuse treatment.

### *Therapeutic Alliance in Substance Abuse Treatment*

Substance use disorders (SUDs) include diagnoses of abuse and dependence of specific categories of psychoactive substances (e.g., cannabis, cocaine, opioids) and of multiple, interchangeable substances concurrently (i.e., polysubstance). Alcohol use disorders (AUDs) are similarly comprised of abuse and dependence diagnoses, with different diagnostic criteria characterizing each (dependence being more severe and possibly including the physiological dependence symptoms of tolerance and withdrawal). While these various diagnoses are categorized distinctly (American Psychiatric Association, 2000), alcohol abuse and dependence and the various forms of substance-specific and polysubstance abuse and dependence will be referred collectively as SUDs for the purposes of the current discussion unless otherwise specified.

While patients with a variety of presenting problems benefit from a strong therapeutic alliance, several factors unique to individuals with SUDs suggest that alliance may be a particularly salient variable in substance abuse treatment. First of all, attrition is a prominent concern when treating this population (e.g., Simpson, Joe, Rowan-Szal, & Greener, 1997) and the presence of a solid therapeutic alliance may improve retention and increase treatment engagement. Also, unsatisfactory relationships are often implicated in the etiology and maintenance of SUDs (Bell, Montoya, & Atkinson, 1997) and insofar as the therapeutic relationship creates a model for healthy relationships, it may positively impact patients' interpersonal functioning and serve to strengthen social networks.

Research has consistently shown that the presence of a strong social network during and after treatment is predictive of positive substance-related outcomes (reviewed by McCrady, 2004).

*SUD Treatment: Alliance/Outcome Relationship*

Despite these indications that substance abuse treatment might be particularly amenable to the positive influence of alliance, its strength has been shown to be an inconsistent predictor of treatment outcome in this population. For example, patient- and therapist-rated alliance as measured by the HAq-II and CALPAS in a randomized controlled trial for individuals with cocaine dependence was not found to be associated with post-treatment drug use outcomes (Barber et al., 1999). A similar null finding was reported by Belding and colleagues (1997) when examining the relationship between the patient- and therapist-rated HAq-II and drug-related outcomes among individuals with opioid dependence. Even more puzzling are data indicating a significant *negative* association between alliance and treatment outcomes among participants in an outpatient methadone maintenance program, where stronger alliances predicted poorer outcomes (Hser, Grella, Hsieh, Anglin, & Brown, 1999).

These null and negative findings are contrasted with other study results indicating a strong *positive* relationship between patient-, therapist-, and observer-rated alliance and substance-related outcomes among individuals with alcohol and other drug dependence (Connors, Carroll, DiClemente, Longabaugh, & Donovan, 1997; Joe, Simpson, Danseraeu, & Rowan-Szal, 2001; Simpson, Joe, Rowan-Szal, & Greener, 1997). Still other studies have reported alliance/outcome relationships that varied depending upon the type of alliance rater and treatment setting. The significant association reported by Fenton and colleagues (2001) between the observer-rated versions of the WAI and



CALPAS and treatment outcome did not extend to the patient- and therapist-rated versions of these measures. Similarly conflicting data were reported by Hser and colleagues (1999) who found alliance to be *negatively* related to outcome among outpatients and *positively* related to outcome among those participating in short-term residential treatment. Taken together, these results are not readily interpretable and suggest that additional research is needed to better understand the relationship between therapeutic alliance and substance-related treatment outcome among individuals with SUDs.

#### *SUD Treatment: Alliance Formation*

Relatively little research has investigated determinants of the formation of alliance within substance abuse treatment. Among the available studies, however, it is clear that patient demographics (e.g., age, gender, race/ethnicity), pre-treatment substance-related characteristics (e.g., quantity/frequency of alcohol/drug consumption, substance-related adverse consequences), and comorbid psychopathology do *not* significantly impact the strength of the alliance formed within treatment (reviewed by Meier, Barrowclough, & Donmall, 2005). While these variables don't appear to exert an influence on alliance, motivation to change one's drinking behavior as assessed upon entry to SUD treatment has been shown in multiple studies to significantly predict subsequent alliance formation (Connors et al., 2000; Joe, Simpson, & Broome, 1998). Within these studies, greater readiness to change was associated with the creation of stronger therapeutic alliances among drug dependent individuals participating in long-term residential treatment and among outpatients with alcohol dependence. Additional research is needed to explore whether this relationship extends to other substance abusing populations.

#### *SUD Treatment: Female-specific Considerations*

Gender differences in the presentation of alcohol and substance use disorders are widely documented. For instance, when compared to men, women are more likely to drink alone in their homes and to cite interpersonal conflict, relationship distress, and negative affective states as reasons for drinking (Menges, McCrady, Epstein, & Beem, 2008). The typical course of substance abuse among women is unique as well; despite a later age of onset, women often experience a more rapid progression of substance-related symptomatology (known as a “telescoping effect”), achieving rates of morbidity/mortality and organ damage similar to male counterparts with much longer histories of abuse (Mann et al., 2005). Women are more likely than men to experience serious medical problems as the result of substance use (Schneider, Kviz, Isola, & Filstead, 1995) and to present with comorbid disorders such as agoraphobia, dysthymia, anorexia, or bulimia (Wilcox & Yates, 1993). Furthermore, major depression and anxiety disorders are particularly prevalent among substance abusing women, with rates of comorbidity nearly two times greater than those among men (Hanna & Grant, 1997). When women seek treatment for substance abuse, they often encounter unique barriers to accessing care, such as lack of childcare, perceived stigma of female substance abuse, and resistance from male partners (Schober & Annis, 1996).

#### *Therapeutic Alliance: Female-Specific Considerations*

While female-specific treatments have been developed to address these unique concerns, no studies to date have investigated the role of therapeutic alliance in substance abuse treatment designed for women. Moreover, the larger therapeutic alliance literature does not indicate gender differences in the formation of alliance or in its relationship with treatment outcome. More broadly, however, a literature does exist examining how gender impacts psychotherapy processes and this may inform considerations on its potential

impact on the therapeutic alliance. The early literature consists predominantly of studies investigating therapist-patient gender “matching” and was borne out of basic findings of gender differences in modes of communication (Tannen, 1990) and level of relationship intimacy (Belle, 1982), as well as indications that both men and women report a preference for therapists of the same gender (Simons & Helms, 1976). These established gender differences led researchers to ask whether therapist-patient gender “mismatching” (e.g., male therapist, female patient) negatively impacts the process and outcome of therapy. Early indications of such an adverse effect (e.g., Jones & Kopple, 1982) were undermined by methodological limitations (reviewed in Garfield, 1994), suggesting the need for additional research.

A more recent and methodologically-sound investigation of this relationship was conducted by Zlotnick and colleagues (1998) and found that gender variables did not significantly impact patient-rated therapist empathy, attrition, or post-treatment outcome. Specifically, they reported that neither therapist-patient gender matching nor patient perceptions regarding whether male vs. female therapists would be more helpful and the subsequent matching vs. mismatching based on this expectation were related to the process and outcome of treatment. Important for the current discussion are the findings that neither gender matching nor preferences for gender matching influenced patient-rated empathy, a variable with close ties to the construct of alliance. While additional research is needed to examine whether other gender-specific variables impact the formation and course of the alliance, therapist-patient gender matching does not appear to do so. Having reviewed female-specific facets of substance abuse treatment and alliance, the current discussion will briefly examine similar considerations in the domain of couples therapy.

*SUD Treatment: Couples Therapy*

Individuals with substance use disorders have been shown to exhibit higher levels of relationship distress than normal controls (Marshall, 2003) and such distress, along with interpersonal conflict more generally, are associated with relapse to substance use after treatment (Maisto, McKay, & O'Farrell, 1995). Behavioral couples therapy (BCT) for alcohol and substance use disorders has sought to address these issues and hypothesizes that relationship functioning and substance use behavior operate within a reciprocal relationship (Epstein & McCrady, 1998). By actively involving the partner of the substance abusing individual in treatment, BCT seeks to modify aspects of the relationship that have maintained substance use (e.g., protection from negative consequences), to build partner-specific coping skills, to bolster partner support for abstinence, and to improve communication and overall relationship satisfaction (Epstein & McCrady, 1998; Fals-Stewart, Klostermann, Yates, O'Farrell, & Birchler, 2005).

While BCT for SUDs has been developed in a variety of iterations, all have been shown to be highly efficacious. In a meta-analysis of 12 randomized controlled trials, Powers and colleagues (2008) found that, when compared to individual-based treatments with those who are married or involved in committed relationships, BCT evidenced superiority across all outcome domains (Cohen's  $d = .54$ ), including frequency of substance use ( $d = .36$ ), consequences of use ( $d = .52$ ), and relationship satisfaction ( $d = .57$ ). Unfortunately, no studies to date have investigated the role of therapeutic alliance in the process and outcome of BCT, therefore, its possible role must be gleaned from the larger couples psychotherapy literature.

#### *Therapeutic Alliance: Couples Therapy*

With the addition of another person to the typical individual psychotherapy therapist-patient dyad, the fundamental dynamics of the therapeutic alliance are changed

within a couples therapy setting. Pinsof and Catherall (1986) suggested that the three components of Bordin's (1979) tripartite model (goal, task, and bond) operate within multiple alliances in the context of couples therapy, including the alliance between partner #1 and the therapist, between partner #2 and the therapist, and between the couple and the therapist. Pinsof (1995) later extended this conceptualization to include a fourth alliance, one between the partners themselves, and highlighted the importance of agreement on tasks and goals within the couple (e.g., "My partner and I agree on the goals of treatment").

Research on therapeutic alliance within couples therapy has yielded results largely consistent with those found in the substance abuse treatment literature and the broader psychotherapy literature. In general, patient-, therapist-, and observer-rated alliance between the therapist and each of the members of the dyad has been a consistent predictor of post-treatment couples therapy outcomes (Knobloch-Fedders, Pinsoff, & Mann, 2007; Symonds & Horvath, 2004). Interestingly, the strength of the alliance/outcome relationship appears to be impacted by whether both parties in a couple agree or disagree on the nature of the therapeutic alliance with their therapist. Symonds and Horvath found that when partners report divergent views on the strength of the alliance (i.e., one partner rates alliance high, the other low; a "split" alliance [Pinsof & Catherall, 1986]) alliance is less able to predict outcome than when partners agree (an "intact" alliance). Within the context of a "split" alliance, the strength of the alliance/outcome relationship is significantly greater when the man rates higher than the woman as opposed to vice versa (Symonds & Horvath).

Other research on predictors of alliance formation in couples therapy has indicated a consistent association between relationship discord at treatment entry and the

development of alliance, such that couples with greater relationship distress are less likely to form strong alliances with their therapist (Knobloch-Fedders, Pinsoff, & Mann, 2004; Mamodhoussen, Wright, Tremblay, & Poitras-Wright, 2005). It should be noted, however, that these studies identified baseline relationship discord as a predictor of alliance formation in couples therapy targeting overall relationship functioning, *not* the symptomatology of one partner. The role of relationship discord in the formation of alliance within conjoint treatment for individual psychopathology has not been investigated.

More generally, notably missing from this literature are studies investigating the relationship between alliance in couples therapy and individual outcomes. While the impact of alliance on couple-level outcomes (e.g., relationship functioning) has been established, only one study to date has examined its influence on individual-level outcomes. Knobloch-Fedders and colleagues (2007) failed to indicate a relationship between patient-rated alliance at sessions 4 and 8 and the individual post-treatment psychiatric symptomatology of each partner. These null findings and the overall paucity of research in this area suggest that further study is needed, particularly among those couples therapies targeting one partner's psychiatric sequelae (e.g., BCT for SUDs).

#### *Current Study*

The current study examined the role of therapeutic alliance in individual and couples cognitive-behavioral treatment for women with alcohol dependence. Three primary aims were pursued: (1) to test the validity and psychometric properties of therapeutic alliance-related items included in a larger, observer-rated Treatment Integrity Rating Scale, (2) to explore predictors of the formation of alliance, and (3) to investigate the relationship between therapeutic alliance and treatment outcome.

This last aim was pursued in part through an analysis of the relationship between treatment outcome and participant self-reported alliance as measured by a validated measure of the construct, the Working Alliance Inventory (WAI). The client-rated short form of the WAI was completed by study participants after they finished a three-month alcohol treatment. This instrument was administered during the first follow-up interview conducted at three months post-baseline (i.e., immediately following the twelfth and final treatment session). Considering that the majority of extant research has utilized within-treatment (as opposed to post-treatment) measurements of alliance (Martin, Garske, & Davis, 2000) and that observer-rated assessments of alliance have been shown to exhibit strong predictive validity (Fenton, Cecero, Nich, Frankforter, & Carroll, 2001), the current study also utilized alliance-related items from a within-treatment, observer-rated Treatment Integrity Rating Scale (TIRS). The TIRS was developed as a means of monitoring the fidelity of treatment provided in the larger randomized clinical trial and includes items assessing various aspects of the construct of alliance. Having evidenced sound psychometric properties as a measure of alliance (detailed hereafter), the TIRS was used in conjunction the WAI as a within-treatment, observer-rated measurement of alliance in testing the predictors of alliance formation and its relationship with treatment outcome.

#### *Hypotheses: Study Aim 1*

Three sets of analyses were used to pursue the first aim of examining TIRS alliance-related items and, as they are all exploratory in nature, no formal hypotheses were tested. First, an exploratory factor analysis was used to test whether alliance-related items selected from the TIRS assessed a singular, distinct construct. An item-selection protocol described hereafter was used to identify items potentially tapping therapeutic

alliance and an exploratory factor analysis was used to examine their factor loading. Second, analyses of internal consistency were conducted upon the items selected via step one in order to examine their reliability as a new scale of alliance. Third, the construct validity of the selected TIRS alliance-related items was tested through an analysis of convergence between its scores and those from a previously-validated measure of the construct, the WAI. Support for the validity of TIRS alliance-related items was defined as a significant association between scores on these items and those on the WAI.

*Hypotheses: Study Aim 2*

Toward the second aim of exploring predictors of the formation of alliance, several hypotheses based on prior research were tested. Among individual patient variables (2a), it was hypothesized that: (2a.i) baseline motivation to change would be associated with the formation of alliance, such that women with higher motivation (as measured by pre-baseline scores on the Recognition and Taking Steps Subscales of the SOCRATES and by the endorsement of an abstinence treatment goal) would be more likely to form strong therapeutic alliances (Connors et al., 2000; Joe, Simpson, & Broome, 1998). Prior research also suggests that pre-treatment drinking severity (Meier, Barrowclough, & Donmall, 2005) and the presence of psychiatric comorbidity (Henry & Strupp, 1994; Meier et al.) should not impede the formation of therapeutic alliance. While no formal hypotheses related to these variables were tested, the current study examined the relationship between alliance formation and both (2a.ii) pre-treatment drinking severity (as measured by pre-baseline PDA and DDD as well as pre-baseline SIP Total Scores) and (2a.iii) the presence of comorbid Axis I and/or Axis II psychopathology.



Prior research has indicated that therapist-patient dyads that are gender “matched” do not differ significantly in alliance formation from those that are “mismatched” (Zlotnick, Elkin, & Shea, 1998). Considered a study-level variable (2b), therapist gender (2b.i) was explored in the current study as a possible predictor of alliance formation with female participants. Additional exploratory analyses regarding the predictors of the formation of alliance were conducted to investigate potential relationships not previously supported in the literature. First, exploratory analyses examined between-study arm (original study design detailed in Method section; 2b.ii) and between-treatment condition (2b.iii) differences in alliance formation to determine if certain treatment modalities (i.e., individual vs. couples) and conditions were more or less conducive to the establishment of alliance.

Among couples therapy variables (2c), it was hypothesized that (2c.i) baseline relationship distress reported by the female participant (as measured by pre-baseline scores on the DAS and AOC) would be inversely associated with the formation of alliance, such that those women who reported greater relationship distress would be less likely to form strong alliances (Knobloch-Fedders, Pinsoff, & Mann, 2004; Mamodhoussen, Wright, Tremblay, & Poitras-Wright, 2005). Also, male partner drinking severity (as measured by pre-baseline drinks per week) was examined as a possible predictor of the formation of alliance within couples therapy conditions (2c.ii). This analysis explored the possibility that greater male partner drinking may have served to inhibit the formation of strong therapeutic alliances during couples therapy between female study participants and their therapists.

The relationship between these individual-, study-, and couple-level variables with the formation of alliance utilized as measures of alliance both the WAI and the TIRS alliance-related items.

*Hypotheses: Study Aim 3*

The third aim of the proposed study was pursued through an analysis of the relationship between therapeutic alliance and treatment outcome. It was hypothesized that scores on the client-rated WAI and those on the observer-rated TIRS alliance-related items would be significantly associated with both individual- and couple-level treatment outcome variables. Individual-level outcome (3a) was assessed by two variables tapping female participants' post-treatment drinking behavior: (3a.i) the quantity and frequency of alcohol consumption and (3a.ii) the degree of alcohol-related adverse consequences. Specifically, it was hypothesized that therapeutic alliance would evidence a significant *negative* association with these outcome variables, such that greater therapeutic alliance would be associated with *less* alcohol consumption and the experience of *fewer* alcohol-related consequences at 3, 9, and 15 months post-treatment (Connors, Carroll, DiClemente, Longabaugh, & Donovan, 1997). Couple-level outcome (3b) was assessed among those participants who received couples treatment by two variables tapping relationship functioning: (3b.i) the degree of dyadic adjustment and (3b.ii) the extent of change desired within the relationship reported by the female participant. Specifically, it was hypothesized that therapeutic alliance would evidence a significant *positive* association with dyadic adjustment and a significant *negative* association with desired change, such that greater alliance would be associated with greater relationship adjustment and less desired change at 3, 9, and 12 months post-treatment (Knobloch-Fedders, Pinsoff, & Mann, 2007; Symonds & Horvath, 2004).

## Method

### *Participants*

Participants were 158 women enrolled in NIAAA grant R01 AA07070-08-12, “Testing Alcohol Behavioral Couples Therapy for Women” between May 2003 and February 2009. At the time of participation in this randomized clinical trial, all women met criteria for a current alcohol use disorder (98% met criteria for alcohol dependence), had consumed alcohol in the 30 days prior to intake, and were in an intimate relationship with a male partner, including husbands, live-in partners of six months or greater, or in a non-cohabiting committed relationship of at least one year’s duration with plans to continue the relationship. All women were at least 18 years of age upon entry in the trial. Women were excluded if they met criteria for physiological dependence on a drug other than alcohol or nicotine, if they had been abstinent from alcohol for more than 30 days, if they showed current evidence of hallucinations, delusions, or other thought disorder not associated with alcohol use. While women were excluded from the couples treatment conditions if they reported domestic violence or feared participating with their partner in treatment, these exclusion criteria did not extend to participation in the individual treatment conditions.

Women were recruited for participation in the clinical trial through IRB-approved advertisements in local newspapers and other media outlets. Advertisements announced the availability of a study for women in heterosexual relationships who are concerned about their drinking and offered free treatment services in the context of a research study. During an initial telephone screening, basic information pertaining to exclusion criteria was gathered and women were asked whether they would like to receive treatment that included their intimate partner or not. Based on this choice, they were assigned to the

individual or couples arm of the study. This selection was not random, but rather was based on participant preference. It should be noted that this study arm assignment protocol was modified during the course of the clinical trial in response to women's overwhelming preference to *not* have their partner involved in treatment. The original "choice" protocol resulted in 99 of the first 116 participants recruited having chosen the Individual Arm of the study. Starting with participant number 117, the "choice" protocol was discontinued and women screened for participation were offered treatment only within the Couples Arm of the study. The remaining 42 women who participated in the clinical trial all received treatment within the Couples Arm and were not provided the option of receiving treatment in the Individual Arm.

Women eligible for participation then attended a clinical screen with or without their male partner (depending upon the study arm they chose) during which a comprehensive battery of assessment instruments was administered. Following the clinical screen, female study participants attended a baseline interview during which additional interview and self-report measures were administered and women were randomized to treatment condition (i.e., one of the two Treatment Conditions within the pre-determined Study Arm). Variables entered into the urn randomization included: relationship status (married versus unmarried), level of depression (below versus greater than/equal to 14 on the BDI), drinking goal (abstinence versus reduced drinking), and partner drinking status (moderate/heavy drinker versus abstinent/light drinker).

Women who selected or were assigned to the couples arm of the study were then randomly assigned to either 12 sessions of Alcohol Behavioral Couples Therapy (ABCT), or a "Blended" ABCT condition in which the male partner attended the clinical screen, session 1, and sessions 7-12 (BL-ABCT). Women who selected the individual arm of the

study were randomly assigned either to “Generic” cognitive-behavioral treatment for alcohol dependence (CBT), or to a modified, Women’s-Specific treatment (WS-CBT). All treatments were provided as weekly, manualized outpatient alcohol treatment by Masters- or Doctoral- level clinicians with experience in cognitive-behavioral treatment of alcohol or other substance use disorders. Treatment was 12 sessions in length and took place over a 3-month time period. All data utilized in the current study were collected during the baseline interview, in-person follow-up interviews or questionnaires completed 3, 9, and 15 months post-baseline, or via observer ratings of audio taped treatment sessions. In terms of inclusion criteria, participants who completed the baseline interview, clinical screen, at least one session of treatment were included in the current study’s statistical analyses.

## *Materials*

### *1.) Therapeutic Alliance Measures*

*1a.) Treatment Integrity Rating Scale – Alliance-Related Items (TIRS-ARI).* The TIRS was developed by the principal investigators of the larger randomized controlled trial in order to monitor the integrity of treatment delivery in each of the four study conditions. Treatment integrity (also known as treatment fidelity) refers to the extent to which the actual implementation of study treatments is in accordance with their intended implementation and consists of two primary components, treatment adherence and therapist competence (Perepletchikova, Treat, & Kazdin, 2007). Whereas treatment adherence is the degree to which the therapist carries out prescribed aspects of the treatment protocol and avoids those that are proscribed, therapist competence is the degree of skill with which the therapist implements prescribed facets of the protocol.

The TIRS is a 54-item, observer-rated scale that taps both dimensions of treatment integrity. Divided into five sections, the TIRS includes sections assessing: specific treatment interventions (Section 1: Specific Interventions; items 1-21), treatment-specific themes (Section 2: Themes; items 22-29), techniques common across addiction treatments (Section 3: Common Factors – Addictions; items 30-34), techniques common across psychotherapies (Section 4: Common Factors – Therapy; items 35-48), and overall manual adherence (Section 5: Manipulation Effects; items 49-51). Each item within the measure assesses both the quantity and quality of the application of the technique or theme under consideration, tapping the two primary dimensions of treatment integrity, adherence and competence, respectively. A 5-point Likert scale is utilized, with quantity items anchored at “1 – not at all,” “2 – a little,” “3 – somewhat,” “4 – considerably,” and “5 – extensively,” and quality items anchored at “1 – very poor,” “2 – poor,” “3 – adequate,” “4 – good,” and “5 – excellent.”

All objective raters were masters- or doctoral-level clinicians who received comprehensive training on proper coding from the co-principal investigator, Dr. Epstein. Training consisted of thorough didactic instruction, real-time group rating of tapes and discussion of coding issues, and independent trainee rating evaluated for convergence with established rating standards. Once trained, raters listened to session audio tapes, completed the TIRS for each session, and attended refresher training courses to counter rater drift. Approximately 50% of all sessions conducted within the clinical trial were rated for treatment integrity, with 25% of tapes being double-rated to evaluate inter-rater reliability.

TIRS Section 4, Common Factors – Therapy, and Section 5, Manipulation Effects, contain several items assessing topics closely related to the construct of therapeutic

alliance. The item-selection protocol described hereafter was used to determine which of these items were included in the analyses of Aim 1. As detailed in the Results section, five TIRS alliance-related items (TIRS-ARI) were found to be a valid and reliable measure of alliance and were subsequently used as an observer-rated, within-treatment measure of alliance in the current study (see Appendix A for complete TIRS-ARI). Upon confirming TIRS-ARI item inclusion, several steps were then taken to generate a single alliance score for each participant whose sessions were rated by a TIRS rater. The procedure used to calculate this single score is detailed in the Results section.

*1b.) Working Alliance Inventory – Short Form – Client (WAI-S-C; Tracey & Kokotovic, 1989).* The WAI-S-C is 12-item self-report measure of the therapeutic alliance as perceived by the client and its items are presented in Appendix B. With three subscales corresponding to each dimension of alliance as conceptualized by Bordin (1979), the WAI-S-C is divided into Goal, Task, and Bond sections containing four items each. Busseri and Tyler (2003) provided evidence of the interchangeability of the WAI-S-C with the longer, 36-item WAI-C and showed that both versions exhibit strong internal consistency and inter-rater reliability as well as predictive validity. The WAI-S-C was completed in the clinical trial by the female participant during the three-month post-baseline follow-up interview and total scores were used in the current study as a measure of therapeutic alliance. Item responses on the WAI-S-C were also used to evaluate the convergent validity of TIRS alliance-related items.

## *2.) Alcohol-Related Measures*

*2a.) Form-90 (Tonigan, Miller, & Brown, 1997).* The Form 90 is a structured clinical interview designed to assess baseline and follow up alcohol use and related functioning. In addition to querying a variety of domains of current functioning, such as

health care utilization, medication usage, and employment status, the Form 90 uses both weekly-grid and day-by-day calendar methods to assess the quantity and frequency of alcohol consumption and drug use in the past 30 to 90 days. The Form 90 exhibits satisfactory psychometric properties (Tonigan et al.) and generates data that can be used to calculate relevant alcohol treatment outcome variables, including percent days abstinent (PDA), mean drinks per drinking day (DDD), and percent heavy drinking days (PHD). The Form 90 was administered to the female participant at baseline and 3, 9, and 15 months post-baseline. PDA, DDD, and PHD were used in the current study as the primary alcohol treatment outcome variables.

*2b.) Short Inventory of Problems (SIP; Miller, Tonigan, & Longabaugh, 1995).*

The SIP is a 15-item self-report measure of alcohol-related adverse consequences with three items comprising each of the following subscales: Physical, Intrapersonal, Interpersonal, Impulse Control, and Social Responsibility. A shortened version of the longer, 50-item Drinker Inventory of Consequences (DrInC; Miller, Tonigan, & Longabaugh, 1995), the SIP has been shown to exhibit strong internal consistency, test-retest reliability, and construct validity (Tonigan, Miller, & Brown, 1997). Female participants completed the SIP at baseline and 3-, 9-, and 15-months post-baseline. SIP total scores were used in the current study as an ancillary alcohol treatment outcome variable.

*3.) Measures of Relationship Functioning*

*3a.) Dyadic Adjustment Scale 7 (DAS-7; Sharpley & Rogers, 1984).*

The DAS-7 is a seven-item self-report measure of relationship satisfaction and functioning.

Psychometric evaluation has shown that the DAS-7, a shortened version of the original Dyadic Adjustment Scale (DAS; Spanier, 1976), exhibits strong internal consistency as



well as criterion and convergent validity (Hunsley, Best, Lefebvre, & Vito, 2001).

Female participants completed the DAS-7 at baseline and 3, 9, and 15 months post-baseline. Higher scores represent greater dyadic adjustment and total scores from the DAS-7 were used in the current study as the primary treatment outcome variable for relationship functioning.

*3b.) Areas of Change Questionnaire (AOC; Weiss, Hops, & Patterson, 1973).*

The AOC is a self-report measure assessing issues surrounding marital change and consists of 68 items separated into two parts. In part 1, respondents indicate the degree of change they would like to see in their spouse and in part 2 respondents indicate the degree of change that they feel their partner would like to see in them. Desired change is reported on a 7-point Likert ranging from -3 (“much less”) to zero (“no change desired”) to 3 (“much more”). The AOC exhibits sound psychometric properties (Mead & Vatcher, 1985) was administered to female participants at baseline and 3, 9, and 15 months post-baseline. Lower total change scores represent greater satisfaction with the current state of a relationship and less desired change. Performance on the AOC was used in the current study as an ancillary treatment outcome variable for relationship functioning.

*4.) Measure of Pre-Treatment Motivation*

*4a.) The Stages of Change and Treatment Readiness Scale (SOCRATES; Miller & Tonigan, 1996).* The SOCRATES is a 19-item self-report measure designed to assess motivation for change among problem drinkers. The SOCRATES is comprised of three subscales assessing various facets of motivation, including Problem Recognition, Ambivalence, and Taking Steps. Psychometric evaluation has shown that the SOCRATES exhibits adequate internal consistency, test-retest reliability, and predictive validity (Miller & Tonigan, 1996). While higher scores on the Problem Recognition and

Taking Steps subscales represent higher levels of motivation to change, scores on the Ambivalence subscale are less readily interpretable. Low scores on this subscale, indicating low levels of ambivalence, may mean that the individual is certain that she/he either *does* or *does not* have a problem with alcohol. Higher scores represent greater uncertainty regarding a potential alcohol problem. Scores on the Problem Recognition and Taking Steps subscales were used in the current study as a continuously-distributed measure of motivation. Study participants completed the SOCRATES during the baseline interview as well as the 3-, 9-, and 15-month follow up interviews.

#### *5.) Measures of Comorbid Psychopathology*

*5a.) Structured Clinical Interview for DSM-IV – Axis I (SCID-I; First, Spitzer, Gibbon, & Williams, 1994).* The SCID-I is a structured diagnostic interview assessing DSM IV Axis I psychopathology. Masters- and doctoral-level clinical interviewers trained by the principal investigators administered the SCID-I to female study participants during the baseline interview and diagnoses derived from this instrument were used in the current study to examine the relationship between comorbid Axis I psychopathology and the formation of therapeutic alliance.

*5b.) Personality Diagnostic Questionnaire for the DSM IV (PDQ-4; Hyler, 1994).* The PDQ-4 is a 107-item self-report diagnostic measure of DSM IV Axis II personality disorders. Female study participants completed a computer-based version of the PDQ-4 during the baseline interview and a computer-generated report identified those personality disorders participants endorsed symptoms of. Personality disorders identified by the PDQ-4 have shown to be highly correlated with clinical diagnosis (Bagby & Farvolden, 2004) and were used in the current study to evaluate the relationship between comorbid Axis II psychopathology and the formation of therapeutic alliance.

## Results

### *Univariate Data Screening*

Univariate data screening procedures implemented in the current study were conducted in accordance with guidelines outlined by Tabachnick and Fidell (2001). All study variables were screened using the following protocol. To begin, normality of variable distribution was evaluated by conducting a Shapiro-Wilk's W test of normality and through an analysis of skewness and kurtosis. Observed W values found to be significantly less than one (at the alpha level .05) were indicative of a distribution that is non-normal and either skewed or kurtotic. A variable was determined to be significantly skewed or kurtotic when the 95% confidence interval surrounding the observed value of skewness or kurtosis (calculated by multiplying the standard error by 1.96) did not include zero. In the event that significant skewness or kurtosis was detected, the distribution was assessed for the presence of univariate outliers. Outliers were defined as any data point 1.5 inter-quartile ranges above the 3<sup>rd</sup> quartile or below the 1<sup>st</sup> quartile and were identified through visual inspection of distribution box plots.

Non-normality of variable distributions was first addressed through a recoding of univariate outliers (Tabachnick & Fidell, 2001). Recoding of outliers is the least-invasive means of attempting to normalize non-normal distributions and is accomplished by converting outlying data points to values one unit larger (or smaller) than the next most extreme score in a distribution. Following this procedure, the variable distribution was then re-tested for normality and degree of skewness and kurtosis. When outlier recoding was found to normalize the distribution, no further action was taken. When such recoding failed to establish normality, data transformation procedures were then implemented. Prior to transformation, however, any distribution found to be skewed in the *negative*

direction (i.e., a pile up of cases on the right side of the distribution) was reflected in order to create skew in the *positive* direction. All data transformation procedures used in the current study are designed to normalize positively skewed distributions. Reflection was achieved by adding one to the largest score in the distribution and then subtracting each score from this value. Following transformation, distributions were then re-reflected to restore the original order of scores. In terms of choosing a type of transformation, Tabachnick and Fidell recommend using the least invasive means of restoring normality and suggest the following order of methods: square root, logarithm (specifically, logarithm 10), and inverse. If non-normal distributions did not achieve normality through a square root transformation, then a logarithm 10 transformation was conducted. Normality was achieved on all distributions with the use of either square root or logarithm transformations and use of the more extreme inverse transformation was found to be unnecessary.

Three variables in the current study's full sample were found to exhibit significantly non-normal distributions and underwent modification according to this protocol. All modifications were applied in the same fashion for the Full Sample, the Individual Arm, and the Couples Arm Sample. One variable, Working Alliance Inventory (WAI) Total Score, achieved normality simply through the recoding of six low-lying outliers to a value one unit lower than the next most extreme score in the distribution. For this particular variable, that meant recoding outliers ranging from 27-48 to a value of 49. A second variable, male partner pre-baseline drinks per week, required both a recoding of outliers and a square root transformation to attain a normal distribution. Lastly, a third variable, mean drinks per drinking day (DDD), underwent a recoding of outliers and a logarithm 10 transformation prior to achieving normality. This

modification was conducted for DDD at all time points (BL, 003, 009, 015). Table 1 presents normality parameters pre- and post-modification for the Full Sample.

### *Multivariate Data Screening*

Multivariate data screening procedures implemented in the current study were also conducted in accordance with guidelines created by Tabachnick and Fidell (2001). All study variables included in linear regression analyses in Study Aims 2 and 3 were screened using the following protocol. The rationale for conducting multivariate data screening when implementing linear regressions is that even when variables exhibit univariate normality, their interaction in multivariate analyses may produce violations of statistical assumptions. Therefore, the following four components of multivariate data screening were conducted: (1) examination of the ratio of cases to independent variables (IVs), (2) evaluation of normality, linearity, homoscedasticity, and independence of residuals, (3) identification of multivariate outliers, and (4) testing for the presence of multicollinearity and/or singularity.

Tabachnick and Fidell (2001) recommend using the following equation when examining the ratio of cases to IVs:  $N \geq 50 + 8x$ , where  $x$  represents the number of IVs to be included in the regression analysis. For example, the inclusion of four IVs in a regression equation would require a sample size of at least 82 cases ( $50 + 8 [4] = 82$ ). The authors indicate that ratios significantly violating these parameters run the risk of inflating the significance of the relationship between the IVs and the dependent variable (DV). The second component of multivariate data screening involves an inspection of residuals, or the difference between obtained values of the DV and those predicted by the regression equation. Linear regression assumes that errors of prediction (the difference between obtained and predicted DV values) are normally distributed around each and

every predicted DV score (normality), are linear, have standard deviations that are approximately equal for all predicted DV scores (homoscedasticity), and are independent of one another. These assumptions may be tested by a visual inspection of the residuals scatterplot generated for a particular regression. A scatterplot that is skewed (non-normal), curved (nonlinear), or forms the shape of a horn (heteroscedastic), indicates violations of these assumptions.

Third, multivariate outliers are identified through an analysis of Mahalanobis Distance, or the distance of each case from the centroid of all cases (Tabachnick & Fidell, 2001). These distances are distributed as a chi-square variable and a critical value is sought where the degrees of freedom are equal to the number of IVs and the alpha value is .001. Observed cases in a regression equation that exceed this critical value represent multivariate outliers and must be analyzed and addressed. Fourth, multicollinearity (i.e., when IVs in a regression equation are highly correlated with one another) and singularity (i.e., when IVs are redundant) are assessed by calculating the squared multiple correlation (SMC) for each variable in a regression equation. An SMC of one indicates singularity or the perfect overlap of the variable with one or more other variables. A value labeled “Tolerance” is then calculated by subtracting the SMC from one and convention suggests that Tolerance levels greater than .01 indicate multicollinearity or singularity.

Multivariate data screening in the current study detected several violations of statistical assumptions that warrant attention. In terms of the ratio of cases to IVs, numerous multiple regressions conducted for Study Aims 2 and 3 did not meet the suggested cut-off sample size. While this was not found to be a concern for analyses using the Full Sample, violations occurred when the Individual Arm and Couples Arm Samples were analyzed separately. Specifically, it was found that four regressions

conducted for Aim 2 (two in the Individual Arm and two in the Couples Arm) and six regressions conducted for Aim 3 (one in the Individual Arm and five in the Couples Arm) had an insufficient cases-to-IVs ratios. Among the three violations found in the Individual Arm, the magnitude of violation was modest and the case deficiency did not exceed 20%. In the Couples Arm, however, the magnitude of violation was found to be more substantial on average and case deficiency was found to be as high as 59%. In those multiple regression analyses where sample size deficiency was detected, caution should be used when interpreting statistically significant results.

No violations of assumptions related to regression residuals were found in the current study and all residuals scatterplots were found to exhibit normality, linearity, homoscedasticity, and independence. Multivariate outliers, on the other hand, were detected in one multiple regression conducted using the Full Sample for Aim 2. This analysis included median household income as a covariate, as significant group differences were found between the Individual and Couples Arms on this variable. Visual inspection of the two cases exceeding the chi-square critical value of Mahalanobis Distance indicated that these two study participants had significantly higher household incomes than other participants (i.e., both exceeded \$600K). It was determined that such income deviation did not warrant removal of these cases from the data set and that their data would be retained in subsequent analyses.

Lastly, one case of multicollinearity was detected in the current study. In Aim 3, multiple regression analyses were conducted between alliance and treatment outcome, controlling for baseline levels of the outcome variable, for any variable combinations found to exhibit significant bivariate correlations. In one case, both the WAI and the TIRS displayed significant bivariate correlations with an outcome variable (DAS 009). In

addition to entering the WAI and the TIRS into their own separate regression equations, one analysis was conducted in which both were entered into the same equation. In this analysis, significant multicollinearity was found and the results of this regression were deemed uninterpretable.

In summary, univariate data screening necessitated the modification of three study variables (WAI Total Score, male partner mean drinks per week, and female participant mean drinks per drinking day) to establish normality. Multivariate data screening detected numerous cases of sample size deficiency, particularly among those regression analyses using the Couples Arm sample, and suggests the use of caution when interpreting significant results. Two cases of multivariate outliers were also found in the Full Sample regression equation for Aim 2, although data from these study participants was retained in subsequent analyses. Multicollinearity was detected on one occasion and the results of this analysis were determined to be inappropriate for further interpretation.

#### *Participant Characteristics*

As shown in Table 2, female participants in the clinical trial were on average 47-years-old, married, non-Hispanic Caucasian, and Catholic. Participants had an average of 1.7 children, attended just over 15 years of education, and had an annual household income of approximately \$96,000. Just over 40% of study participants were employed full time. Male partners of study participants were found to be slightly older, to be more likely to work full time, and to report mostly non-Hispanic Caucasian ethnic and racial identities.

A series of independent samples t-tests and chi-square analyses were conducted to examine potential group differences among study participants. Participants who received treatment in the Individual Arm ( $n = 99$ ) of the clinical trial were compared to those who



received treatment in the Couples Arm ( $n = 59$ ) on a number of variables, including demographic characteristics as well as those baseline variables identified in Aim 2 as potential predictors of the formation of alliance. As shown in Table 2, results indicated that participants in the Individual Arm had lower household income ( $t [153] = 2.18, p = .03$ ) than those participants in the Couples Arm. No significant group differences were found between Treatment Conditions (CBT, WS-CBT, ABCT, BL-ABCT). Among those women in the Couples Arm, participants who *chose* the Couples Arm ( $n = 17$ ) reported significantly greater recognition of a problem with alcohol ( $t [57] = 2.47, p = .017$ ) than those participants who were *assigned* to the Couples Arm ( $n = 42$ ), as evidenced by higher scores on the Recognition subscale of the SOCRATES (Chose:  $M = 30.9, SD = 2.9$ ; Assigned:  $M = 28.1, SD = 4.3$ ).

#### *Aim 1: TIRS-ARI*

The following item-selection protocol was used as a means of identifying TIRS items that potentially tap the construct of alliance. The principal investigator of the current study and a co-principal investigator of the larger clinical trial, Dr. Epstein, independently selected items from the TIRS that exhibited a face-valid, theoretical connection Bordin's (1979) tripartite conceptualization of therapeutic alliance. Specifically, the investigators selected those TIRS items believed to assess the Bond component of Bordin's model. Items with a connection to the Goal and Task components of alliance were not selected, as these aspects of the construct were not believed to be measured by the TIRS. Therefore, the investigators focused exclusively on selecting those TIRS items exhibiting an apparent association with the affective bond between patient and therapist.

The principal investigator of the current study chose the following seven TIRS items as potentially tapping the Bond component of Bordin's conceptualization of alliance: 36 (Continuity/reference to past sessions), 37 (Reflective listening), 38 (Exploration of feelings), 39 (Support for patient efforts), 43 (Therapist rapport with woman), 46 (General skillfulness/effectiveness), and 47 (Empathy). Please refer to Appendix A for specific wording of TIRS items. While the co-principal investigator independently selected six of these seven items, she did not include item 46 among her selection. Upon further discussion, it was determined that item 46, like item 36, may tap the same facet of the therapeutic bond that is assessed in item 5 of the WAI, "I am confident in my therapist's ability to help me." Therefore, item 46 was retained for inclusion in subsequent psychometric analyses. The item-selection procedure implemented in the current study is in accordance with psychometric convention pertaining to content validity and item inclusion in a scale or subscale (Cohen & Swerdlick, 2002).

Having identified seven TIRS items potentially tapping the construct of alliance, an exploratory factor analysis (EFA) was performed on the full-scale, 54-item TIRS in order to examine whether these items are assessing a single construct or multiple, overlapping constructs. According to a review article describing the best practices in EFA within the behavioral sciences (Costello & Osborne, 2005), the most widely used method of data extraction when conducting an EFA is principal components analysis (PCA). While some controversy over extraction method exists, many psychometric theorists suggest that PCA is either favorable or equivalent to other methods of extraction (e.g., maximum likelihood, unweighted least squares, generalized least squares, etc.; Steiger, 1990; Velicer & Jackson, 1990). Costello and Osborne's review also indicated

that the vast majority of prior research utilizing EFA implemented the Kaiser criterion in the determination of the number of factors to be retained for rotation. When using the Kaiser criterion, a fixed number of factors is not pre-specified; rather, extraction is determined statistically by the retention of factors exhibiting eigenvalues greater than 1 (Costello & Osborne).

Costello & Osborne (2005) go on to indicate that the use of rotation in EFA is a widely-accepted means of enhancing the interpretability of generated factors. Rotation is a statistical procedure that maximizes the loading of each item on one of the extracted factors while minimizing its loading on all remaining factors. This is accomplished by changing the absolute values of variables while keeping their differential values constant. The authors note that the vast majority of EFAs conducted in the behavioral sciences utilize some form of orthogonal rotation (e.g., varimax, quartimax, equamax) and that this method is preferred over an oblique rotation (e.g., oblimin, quartimin, promax) when strong theoretical justification for a dependent relationship among factors is not present. Among orthogonal rotation methods, the authors indicate that varimax is by far the most frequently chosen among behavioral science researchers.

A final consideration in specifying the parameters of an EFA is the determination of the absolute factor loading value below which items will be suppressed and not included on a factor. Tabachnick and Fidell (2001) suggest that items with factor loadings below .32 do not assess the same construct as the remaining items and that such items should be removed from the scale or subscale under examination. Taken together, these recommendations regarding EFA in the behavioral sciences suggest the use of PCA with varimax rotation, using the Kaiser criterion, with a minimum factor loading of at least .32. All EFAs in the current study were conducted in accordance with these facets

of psychometric convention, albeit with a more conservative minimum factor loading of .5. Furthermore, EFAs performed for the current study were found to pass the two key tests evaluating whether a particular data set is appropriate for factor analysis: the Kaiser-Meyer-Olkin (KMO) measure of sampling adequacy as well as Bartlett's test of sphericity (Tabachnick & Fidell, 2001).

EFA was used in the current study to determine if the seven items identified above by study authors assess a single or multiple constructs. Should these seven items tap a singular construct different than the remaining 47 items on the TIRS, it would be expected that they would hang together on a factor with few or no other items on it. Recall that each item on the TIRS is comprised of two distinct components, Quantity and Quality, and that each was scored separately during the tape rating protocol. As each of the items yielded scores for both Quantity and Quality, separate EFAs were conducted for each. Results from the full-scale Quantity EFA indicated that five of these seven items loaded significantly on a factor with no other items on it. The two items found not to load on this factor are conceptually similar (#36: Continuity/reference to past sessions and #46: General skillfulness/effectiveness) and were located on a factor with eight other items on it. Table 3 includes the factor loadings for the five items located on the same factor.

These results suggest that while items 37, 38, 39, 43, and 47 are tapping a distinct construct, items 36 and 46 are assessing multiple, overlapping constructs. This conclusion is supported by the results of the full-scale Quality EFA as well. The five items that hung together in the Quantity PCA were found to load significantly on the same factor in this analysis also, whereas items 36 and 46 were not found to do so. In sum, results from the full-scale TIRS PCA suggest that only five of the seven items selected by investigators as

potentially assessing alliance tap a distinct construct and should be included as a measure of alliance. Therefore, the following TIRS items were utilized in subsequent analyses: 37, 38, 39, 43, and 47.

Upon confirming TIRS-ARI item inclusion, several steps were then taken to generate a single alliance score for each participant whose sessions were rated by a TIRS rater. The first step in this process was to determine if the Quantity and Quality components of each item could be collapsed into a single aggregate score. In order to assess for the feasibility of such an aggregation, Pearson's  $r$  correlations were conducted between the Quantity and Quality scores for each item. All correlations were found to be significant at the  $p < .01$  level and the mean correlation value was found to be  $r = .803$ . Evidence of such a strong association between the Quantity and Quality scores suggested that it was appropriate to combine the two item components into a single value. This single value was calculated by taking the mean of the value rated for Quantity and the value rated for Quality, yielding a variable hereafter termed the TIRS-ARI Aggregate Score. It should also be noted that the TIRS-ARI Aggregate Scores were found to exhibit strong internal consistency (Coefficient alpha = .866).

Then, the TIRS-ARI Total Score variable was generated by summing the Aggregate Scores for each of the five items. However, as most study participants had multiple treatment sessions rated, this meant that most study participants had multiple TIRS-ARI Total Scores as well. For those participants with multiple TIRS-ARI Total Scores, a single score was calculated by taking the mean of all scores. For those participants for whom only one session was rated, this procedure was omitted and the sole TIRS-ARI Total Score remained unchanged. Following this procedure, a single TIRS-

ARI Total Score was generated for each participant who had one or more of their sessions coded by a TIRS rater.

The final step in the psychometric evaluation of the TIRS-ARI involved an examination of construct validity. One means of establishing construct validity is to provide evidence of convergence between scores on the measure under evaluation and those from an established, previously-validated measure of the construct (Tabachnick & Fidell, 2001). For the purposes of the current study, this was achieved by examining the association between scores on the TIRS-ARI and those from the WAI. While these two measures utilize discrepant ratings systems (i.e., the WAI is rated by the patient and the TIRS is rated by an observer), prior research has shown that these methods overlap significantly in terms of shared variance (Cecero, Fenton, Frankforter, Nich, & Carroll, 2001) and that they exhibit similar predictive validity (Fenton, Cecero, Nich, Frankforter, & Carroll, 2001). Therefore, the WAI is an appropriate tool to be used in evaluating the construct validity of TIRS-ARI. Were the TIRS-ARI indeed measuring the construct of alliance, it would be expected that scores from this measure would evidence a significant, positive Pearson's  $r$  correlation with those from the WAI. Results from this analysis indicate that TIRS-ARI Total Scores were significantly correlated with WAI Total Scores ( $r = .30, p = .001$ ), thus providing evidence of convergent validity.

These results, coupled with those supporting the internal consistency and singular factor structure described above, suggest that the TIRS-ARI is a valid and reliable measure of the construct of alliance and is an appropriate within-treatment, observer-rated supplement to the post-treatment, patient-rated WAI.

### *Aim 2: Predictors of Alliance*

The current study's second aim of investigating predictors of the formation of alliance was pursued via two sets of statistical analyses. First, continuously-distributed predictor variables were entered into two separate multiple regression models, one predicting total scores on the WAI and one predicting those on the TIRS-ARI (hereafter simply referred to as the TIRS). Second, the relationship between categorically-distributed predictor variables and subsequent alliance formation was analyzed through a series of ANOVAs. All Aim 2 analyses were conducted separately for the Full Sample, Individual Arm Sample, and Couples Arm Sample, and Table 4 presents pre-baseline values of all predictor variables.

Prior to conducting multiple regression analyses, continuous predictor variables were first entered into bivariate correlation matrixes. Recall that continuous predictor variables include pre-baseline motivation (Problem Recognition [SOC Rec], Taking Steps [SOC TS]) and drinking severity (percent days abstinent [PDA], mean drinks per drinking day [DDD], Short Inventory of Problems [SIP]) for the all three samples as well as pre-baseline relationship functioning (Dyadic Adjustment Scale [DAS], Areas of Change Questionnaire [AOC] and male partner drinking severity (drinks/week) for the Couples Arm Sample. As shown in Table 5, a bivariate correlation matrix conducted with the Full Sample did not yield any statistically-significant associations between predictor variables and either the WAI or TIRS. However, among participants in the Individual Arm, a significant bivariate Pearson's  $r$  correlation was found between WAI Total Scores and both pre-baseline scores on the Recognition Subscale of the SOCRATES ( $r = .31, p = .004$ ) and pre-baseline mean drinks per drinking day (DDD;  $r = .24, p = .024$ ) (see Table 6). As shown in Table 7, a significant negative bivariate correlation was found between

pre-baseline SIP scores and WAI Total scores among participants in the Couples Arm Sample ( $r = -.31, p = .032$ ).

Having examined bivariate correlation matrixes, the current study went on to conduct multiple regression analyses examining the relationship between continuous predictor variables and the formation of alliance. Sequential, or hierarchical, multiple regression was utilized in examining predictors of alliance in the Full Sample and Couples Arm Sample while standard, or simultaneous, multiple regression was used in the Individual Arm Sample. Hierarchical regression was chosen for the Full and Couples Arm samples because this method allows for the entry of a covariate into the regression equation (Tabachnick & Fidell, 2001).

As previously documented, significant differences in household income and in Problem Recognition (SOC Rec) scores were found between groups in the Full Sample (i.e., participants in the Individual Arm had lower incomes than those in the Couples Arm) and Couples Arm Sample (i.e., participants who *chose* the Couples Arm had higher scores on the SOC Rec than those who were *assigned* to the Couples Arm), respectively. Therefore, it was necessary to control for the potential impact of these group differences when examining predictors of alliance. Hierarchical regression allowed for detection of explained variance attributable to predictor variables above and beyond that attributable to these covariates (Tabachnick & Fidell, 2001).

Standard multiple regression was implemented for the Individual Arm Sample, as this data set did not include any significant group differences and, thus, did not require the entry of covariates. In the absence of a need to control for variance attributable to a covariate, Tabachnick and Fidell (2001) recommend the use of standard multiple



regression. When using this method, all IVs enter into the regression equation at once and each is assessed as if it had entered the regression after all other IVs had entered.

Not surprisingly, results from multiple regression analyses largely mirrored those from the bivariate correlation matrixes. No significant multiple regression equations were generated in the Full Sample, in which the covariate was entered in step one and the predictor variables were entered in step two. In the Couples Arm Sample, the significant bivariate association observed between SIP and WAI was not maintained in the regression equation ( $\beta = -.19, p = .31$ ) and no other significant relationships were found in this sample among the remaining multiple regression analyses.

Within the Individual Arm Sample, the association between pre-baseline DDD and WAI Total Score observed in the bivariate correlation was not maintained in the multiple regression equation ( $\beta = .14, p = .24$ ). However, Problem Recognition (SOC Rec), when entered into a standard multiple regression equation with independent variables including percent days abstinent (PDA), mean drinks per drinking day (DDD), Short Inventory of Problems Total Score (SIP), Problem Recognition (SOC Rec), Taking Steps (SOC TS) and the dependent variable of WAI Total Score (see Table 8), was found to be significantly associated with alliance as measured by the WAI ( $\beta = .32, p = .022$ ). A beta value of .32 indicates that a change of one standard deviation in the independent variable, Problem Recognition (SOC Rec), is associated with a change of .32 standard deviations in the dependent variable, WAI Total Score (Tabachnick & Fidell, 2001). The overall model summary from this regression equation was significant (Adjusted  $R^2 = .08$ ,  $F [5, 78] = 2.45, p = .041$ ). An Adjusted  $R^2$  value of .08 indicates that the regression equation model accounts for roughly 8% of the variance in WAI Total Scores. It should be noted that while this regression model displayed sample size deficiency (i.e., 90 cases

recommended, 84 observed), this deficiency is not of sufficient magnitude to compromise the interpretability of results (Tabachnick & Fidell, 2001).

With the completion of analyses involving continuous predictor variables, the current study then examined the relationship between categorical predictor variables and the formation of alliance. This was accomplished by conducting ANOVAs in which the categorical predictor variable served as the IV and alliance, as measured by either the WAI or TIRS, served as the DV. Categorical predictor variables included: Axis I diagnosis (Y/N), Axis II diagnosis (Y/N), Patient/therapist gender matching (Y/N), Treatment Condition (CBT, FS-CBT and/or ABCT, BL-ABCT), and Abstinence goal (Y/N) for all three samples; Study Arm (Individual/Couples) for the Full Sample alone; and Choice (Chose/Assigned) for the Couples Arm Sample alone.

As shown in Figures 1, 2, and 3, results indicated that those participants who chose an abstinence goal for treatment developed significantly stronger alliances with their therapist as measured by the WAI in both the Full ( $F [2, 127] = 5.0, p = .02$ ) and Individual Arm ( $F [1, 83] = 10.1, p = .002$ ) Samples and by the TIRS in the Full Sample ( $F [2, 125] = 4.7, p = .03$ ) than those participants who chose a non-abstinence goal. A second significant result, depicted in Figure 4, was found between Study Arms in the Full Sample, such that participants in the Individual Arm reported significantly stronger alliances with their therapist on the WAI than those participants in the Couples Arm ( $F [2, 127] = 6.8, p = .01$ ). Lastly, among participants in the Couples Arm Sample, women with one or more comorbid Axis I psychiatric diagnoses were found to develop stronger alliances as measured by the TIRS than those participants with no such diagnoses ( $F [2, 45] = 5.9, p = .02$ ) (see Figure 5). Please refer to Tables 9 – 13 for means and standard deviations of these analyses.

In summary, predictors of the formation of therapeutic alliance were explored separately for continuously-distributed and categorically-distributed variables. Study Aim 2 hypotheses and exploratory aims will now be restated with the inclusion of one of the following terms: supported (hypothesis)/evidence (exploratory), partially supported/mixed evidence, or not supported/no evidence. Among individual patient variables (2a), it was hypothesized that baseline motivation to change would be associated with the formation of alliance, such that women with higher motivation would be more likely to form strong therapeutic alliances (2a.i – *PARTIALLY SUPPORTED*). This hypothesis was supported by results indicating a significant association between score on the SOCRATES Problem Recognition (SOC Rec) and those on the Working Alliance Inventory (WAI) in a multiple regression equation and by results showing a significant difference in WAI scores between those participants who chose an abstinence goal (i.e., an indicator of motivation for alcohol-related behavior change) and those who chose a non-abstinence goal. It should be noted, however, that a relationship was not found between alliance formation and the other subscale of the SOCRATES utilized in the current study, Taking Steps (as mentioned in the description of the SOCRATES in the Method section, scores on the third and final subscale of this instrument, Ambivalence, are difficult to interpret and were not used in the current study). This null finding between the Taking Steps subscale and subsequent alliance formation attenuates the strength of support for hypothesis 2a.1.

Exploratory aim 2a.ii investigated the relationship between pre-treatment drinking severity and formation of alliance (*MIXED EVIDENCE*). While multiple regression analyses did not indicate a relationship between drinking severity and subsequent alliance formation, significant bivariate correlations were detected between baseline mean drinks

per drinking day (DDD) and WAI in the Individual Arm Sample and between adverse alcohol-related consequences (SIP) and WAI in the Couples Arm Sample. The exploratory aim among individual patient variables investigated the relationship between the presence of comorbid Axis I and/or Axis II psychopathology and alliance formation (2a.iii – *MIXED EVIDENCE*). While the majority of analyses failed to indicate a relationship between the presence of comorbid psychopathology and alliance formation, participants in the Couples Arm Sample diagnosed with one or more comorbid Axis I disorders were found to form stronger alliances than those without such diagnoses.

Among study variables (2b), exploratory aim 2b.1 investigated the relationship between therapist gender and alliance formation with female participants (*NO EVIDENCE*). Therapist gender was not found to be associated with the formation of alliance; therapist-patient dyads that were gender “matched” did not differ significantly in alliance formation from those that were “mismatched.” No significant differences were detected between these groups in the Full, Individual Arm, or Couples Arm Samples.

Among couples therapy variables (2c), it was hypothesized that baseline relationship distress reported by the female participant would be inversely associated with the formation of alliance, such that those women who reported greater relationship distress would be less likely to form strong alliances (2c.i – *NOT SUPPORTED*). Results from the current study failed to indicate a significant relationship between relationship distress as measured by the Dyadic Adjustment Scale (DAS) and Areas of Change Questionnaire (AOC) and subsequent alliance formation between patient and therapist.

Exploratory analyses regarding the predictors of alliance will be reviewed with the inclusion of a term describing support (*EVIDENCE*), or lack thereof (*NO EVIDENCE*),

for the relationship in question. First, exploratory analyses examined between-study arm (2b.ii - *EVIDENCE*) and between-treatment condition (2b.iii – *NO EVIDENCE*) differences in alliance formation. While results indicated that participants in the Individual Arm formed significantly stronger therapeutic alliance than those in the Couples Arm, no significant differences were found among the four treatment conditions. Second, male partner drinking severity was examined as a possible negative predictor of the formation of alliance within couples therapy conditions (2c.ii – *NO EVIDENCE*). Male partner drinking was not associated with weaker therapeutic alliance during couples therapy between female study participants and their therapists.

*Aim 3: Relationship between Alliance and Treatment Outcome*

The third aim of the current study sought to investigate the relationship between therapeutic alliance (WAI, TIRS) and drinking outcome (percent days abstinent [PDA], mean drinks per drinking day [DDD], alcohol-related problems [Short Inventory of Problems; SIP]) within all three samples and relationship functioning (Dyadic Adjustment Scale [DAS], Areas of Change Questionnaire [AOC]) within the Couples Arm Sample at 3-, 9-, and 15-months post-baseline (referred to hereafter as 003, 009, and 015). Table 14 presents the means and standard deviations of all variables at all time points. Bivariate correlation matrixes were first calculated for each sample and Tables 15 and 16 present the results of these analyses. Any bivariate relationship found to exhibit a significant Pearson's  $r$  correlation was then entered into a hierarchical multiple regression equation, with the pre-baseline level of the outcome variable entered in step one as a covariate. Household income and Problem Recognition (SOC Rec) were also entered as covariates in the Full Sample and Couples Arm Sample analyses, respectively. As noted previously,

hierarchical regression allows the regression model to control for the impact of a covariate (Tabachnick & Fidell, 2001).

In the current study, such a model allowed for identification of the proportion of variance in the DV (treatment outcome) attributable to the IV (alliance) above and beyond that attributable to the pre-baseline level of the DV. When the pre-baseline level of the DV is entered into step one of the regression model, the proportion of variance attributable to the IV is captured by the degree of change observed in  $R^2$  after step two, the entry of the IV. This degree of change is represented symbolically as  $\Delta R^2$  and is tested against the null hypothesis of no change in explained variance. A  $\Delta R^2$  value that is statistically significant indicates that the IV entered in step two significantly predicts the variability in the DV above and beyond that predicted by the IV entered in step one.

After controlling for pre-baseline PDA and income, the significant bivariate correlations found in the Full Sample between WAI and PDA at 3- and 15-months follow up were not maintained in the regression equation. However, when WAI was entered in the second step of the regression model predicting PDA at 9-months follow up, alliance was found to significantly increase explained variance ( $\Delta R^2 = .03$ ,  $\beta = .18$ ,  $p = .04$ ). The overall model summary from the second step of this regression equation was significant (Adjusted  $R^2 = .14$ ,  $F [3, 115] = 7.18$ ,  $p < .001$ ). See Table 17 for unstandardized regression coefficients and standard error values derived from this equation.

Similar results were found for the Individual Arm Sample as well. While the bivariate association between TIRS and DDD 015 was not maintained, regression equations indicated a significant relationship between WAI and PDA at both 9- ( $\Delta R^2 = .05$ ,  $\beta = .22$ ,  $p = .035$ ) and 15-month follow up ( $\Delta R^2 = .09$ ,  $\beta = .29$ ,  $p = .004$ ). The overall model summary from the second step of the regression equation was significant for both

WAI/PDA 009 (Adjusted  $R^2 = .18$ ,  $F [2, 75] = 9.37$ ,  $p < .001$ ) and WAI/PDA 015 (Adjusted  $R^2 = .18$ ,  $F [2, 72] = 14.26$ ,  $p < .001$ ). See Tables 18 and 19 for unstandardized regression coefficients and standard error values derived from these models.

Among participants in the Couples Arm Sample, three of the five bivariate correlations were no longer significant after controlling for the influence of pre-baseline levels of the outcome variable. The two significant results in the Couples Arm Sample included a relationship between WAI and DAS 003 ( $\Delta R^2 = .06$ ,  $\beta = .26$ ,  $p = .005$ ) as well as between TIRS and DAS 009 ( $\Delta R^2 = .08$ ,  $\beta = .29$ ,  $p = .009$ ). The overall model summary from the second step of the regression equation was significant for both WAI/DAS 003 (Adjusted  $R^2 = .68$ ,  $F [3, 44] = 34.19$ ,  $p < .001$ ) and TIRS/DAS 009 (Adjusted  $R^2 = .63$ ,  $F [3, 33] = 21.36$ ,  $p < .001$ ). See Tables 20 and 21 for unstandardized regression coefficients and standard error values derived from these equations.

While Aim 3 regression analyses conducted with the Full Sample and Individual Arm Sample exceeded suggested case-to-IV ratios, those conducted with the Couples Arm Sample did not. Specifically, the regression equation including the WAI and DAS 003 was 27% deficient (66 cases recommended, 48 observed) and the equation including the TIRS and DAS 009 was 44% deficient (66 cases recommended, 37 observed). These sample size deficiencies suggest the use of caution when interpreting statistically-significant results.

In summary, Study Aim 3 examined the relationship between therapeutic alliance and treatment outcome was explored through a series of hierarchical multiple regression analyses in which the baseline level of the outcome variable was entered as a covariate. It was hypothesized that therapeutic alliance would evidence a significant *negative* association with drinking-related outcome variables (3a), such that greater therapeutic

alliance would be associated with *less* alcohol consumption (3a.i – *PARTIALLY SUPPORTED*) and the experience of *fewer* alcohol-related consequences (3a.ii – *NOT SUPPORTED*). Hypothesis 3a.i was partially supported by multiple regression analyses indicating a significant relationship between WAI scores and percent days abstinent (PDA) at 9-months post-baseline in both the Full and Individual Arm Samples and at 15-months post-baseline in the Individual Arm Sample. However, alliance was not found to exhibit a significant relationship with adverse alcohol-related consequences as measured by the Short Inventory of Problems (SIP).

Among couple-level outcome variables (3b), it was hypothesized that therapeutic alliance would evidence a significant *positive* association with dyadic adjustment (3b.i – *PARTIALLY SUPPORTED*) and a significant *negative* association with desired change (3b.ii – *NOT SUPPORTED*), such that greater alliance would be associated with greater relationship adjustment and less desired change. Partial support for Hypothesis 3b.i was found in multiple regression analyses indicating a significant relationship between WAI scores and dyadic adjustment (Dyadic Adjustment Scale; DAS) at 3-months post-baseline and between TIRS scores and adjustment at 9-months post-baseline. No such relationship was detected between alliance and desired change as measured by the Areas of Change Questionnaire (AOC).

## Discussion

The current study examined the role of therapeutic alliance in individual and couples cognitive-behavioral treatment for women with alcohol dependence. Three primary aims were pursued: (1) to test the validity and psychometric properties of therapeutic alliance-related items included in a larger, observer-rated Treatment Integrity Rating Scale, (2) to explore predictors of the formation of alliance, and (3) to investigate



the relationship between therapeutic alliance and treatment outcome. Data were derived from a randomized clinical trial testing four treatment conditions nested within two treatment arms (Individual and Couples). As participants were not randomized to treatment arm in the clinical trial, all analyses conducted in the current study were carried out separately for the Full Sample ( $N = 158$ ), Individual Arm Sample ( $N = 99$ ), and Couples Arm Sample ( $N = 59$ ).

Analyses conducted for Aim 1 were exploratory in nature and no formal hypotheses were tested. Five items from the Treatment Integrity Rating Scale (TIRS), an observer-rated measure of treatment fidelity, were found to exhibit a face-valid theoretical connection to the construct of alliance and to evidence a singular factor structure in principal components analyses. These five items were also found to display strong internal consistency and to exhibit significant convergent validity with a patient-rated measure of alliance, the Working Alliance Inventory (WAI). Having evidenced sound psychometric properties as a measure of alliance, these items from the TIRS were used in conjunction the WAI as a within-treatment, observer-rated measurement of alliance in testing the predictors of alliance formation and its relationship with treatment outcome.

Aim 2 examined predictors of the formation of therapeutic alliance and several hypotheses based on prior research were tested. It was hypothesized that pre-baseline motivation for alcohol-related behavior change would be positively associated with subsequent alliance formation (Connors et al., 2000; Joe, Simpson, & Broome, 1998) and the current study partially supports this hypothesis. Results indicated that those participants who chose an abstinence-based treatment goal (an index of motivation) formed significantly stronger alliances with their therapists than those who chose non-abstinence goals. These group differences were detected on both the WAI and the TIRS

in the Full Sample and on the WAI in the Individual Sample. No such differences were found among participants in the Couples Arm Sample.

Further evidence of this relationship was found among results from multiple regression analyses indicating a significant association between scores on the Problem Recognition subscale of the SOCRATES and those on the WAI among participants in the Individual Arm Sample. Again, no such relationship was detected among participants in the Couples Arm. Interestingly, the Taking Steps subscale of the SOCRATES was not found to be associated with alliance formation and, while it is unclear what accounts for this null finding, the overall strength of support for the hypothesized relationship between motivation and alliance formation is attenuated by this result. Collectively, however, study results suggest that pre-treatment motivation as measured by abstinence goal and Problem Recognition is a significant predictor of subsequent alliance formation among women participating in individual, but not couples, therapy for alcohol dependence. The implications of this and other treatment modality differences are discussed hereafter.

It was also found that pre-treatment drinking severity was not associated with the formation of alliance and this finding is consistent with prior research (Meier, Barrowclough, & Donmall, 2005). While significant bivariate correlations were detected between mean drinks per drinking day (DDD) and WAI (positive correlation) in the Individual Arm Sample and between adverse alcohol-related consequences (SIP) and WAI (negative correlation) in the Couples Arm Sample, these associations were not maintained in multiple regression analyses. The mitigation of the predictive ability of DDD and SIP when analyzed among other predictor variables in a regression equation suggests that pre-treatment drinking severity need not necessarily impede the formation of a strong alliance.

Aim 2 results are also consistent with prior research indicating that the formation of alliance in individual psychotherapy is not impeded by the presence of comorbid Axis I and/or Axis II psychopathology (Henry & Strupp, 1994; Meier, Barrowclough, & Donmall, 2005). However, the current study was unique in its examination of alliance formation in alcohol behavioral couple therapy and an interesting finding emerged: the presence of one or more Axis I diagnoses was associated with the formation of *stronger* alliances among participants in the Couples Arm Sample. While small sample size suggests the use of caution when interpreting this finding, these results hold potential clinical implications and these will be discussed shortly.

In terms of treatment-level variables, results indicated that therapist gender was not associated with the formation of alliance and this finding is consistent with prior research (Zlotnick, Elkin, & Shea, 1998). Results indicated that therapist-patient dyads that were gender “matched” did not differ significantly in alliance formation from those that were “mismatched.” This encouraging result suggests that women with alcohol dependence are equally able to form strong alliances with male therapists as with female therapists.

A final hypothesis was tested for Aim 2 involving couples therapy variables. While prior research has shown baseline relationship distress to be inversely associated with the formation of alliance between the therapist and individual patients participating in couples therapy (Knobloch-Fedders, Pinsoff, & Mann, 2004; Mamodhoussen, Wright, Tremblay, & Poitras-Wright, 2005), no such relationship was found in the current study. It is important to note, however, that the current study differed significantly from those conducted by Knobloch-Fedders and colleagues and by Mamodhoussen and colleagues. Specifically, both of these prior studies assessed relationship distress from the perspective

of *both* partners, whereas the current study relied solely on the female partner's report. Furthermore, these prior studies were conducted within the context of traditional couples therapy, where the identified treatment goal was improvement in relationship functioning. The current study differed insofar as the focus of treatment was the pathology of a single partner (i.e., the female partner's drinking). It is possible that these factors contributed to the divergence in current study results from prior research. With this in mind, current study findings did not detect a relationship between relationship functioning and alliance formation. Scores on the WAI and TIRS were not found to be associated with pre-baseline dyadic adjustment (DAS) or degree of desired relationship change (AOC), indicating that alliance formation was unaffected by relationship distress experienced by the female study participants. This result suggests that poor relationship functioning among women with alcohol dependence may not necessarily impede the creation of strong alliances within the context of couples therapy.

Similar null findings were found for two out of three Aim 2 exploratory analyses conducted in the current study. First, we explored the possibility that severity of male partner drinking may negatively impact the formation of alliance between the female participant and therapist within the Couples Arm Sample. No such relationship was found, indicating that male partner drinking severity was not associated with female patient-therapist alliance formation. Second, despite the absence of differences in alliance (WAI and TIRS) among the four treatment conditions (CBT, FS-CBT, ABCT, BL-ABCT), a significant difference was found between study arms. Specifically, women in the Individual Arm of the clinical trial formed significantly stronger alliances as measured by the WAI than women in the Couples Arm. This interesting finding has not been reported elsewhere in the alliance literature. It is possible that the male partner's

presence during some or all of the therapy sessions served to inhibit the establishment of an affective bond between female participant and therapist or perhaps to impede their agreement upon the tasks and goals of treatment. Also, alliance formation between female patient and therapist may have been hamstrung by the unique challenges of attempting to forge equitable and balanced alliances with both members of a dyad within the context of couples therapy.

The final aim of the current study explored the relationship between therapeutic alliance and treatment outcome. It was hypothesized for Aim 3 that stronger alliances would be associated with better drinking-related outcomes (Connors, Carroll, DiClemente, Longabaugh, & Donovan, 1997) and results from the current study partially support this hypothesis. After controlling for pre-baseline levels of outcome variables, multiple regression analyses indicated that alliance (WAI) was significantly associated with percent days abstinent (PDA) at 9-months post-baseline in both the Full and Individual Arm Samples and at 15-months post-baseline in the Individual Arm Sample. Women participating in individual therapy for alcohol dependence who reported strong alliances with their therapists were more likely to be abstinent from alcohol after treatment than those reporting weak alliances. These significant results did not extend to participants within the Couples Arm Sample and, contrary to hypotheses, alliance was not found to be associated with mean drinks per drinking day (DDD) or with adverse alcohol-related consequences (SIP). Alliance as measured by the TIRS was not predictive of any alcohol treatment outcomes.

Similar partial support was provided for the final Aim 3 hypothesis that stronger therapeutic alliances would be associated with better relationship functioning at follow up among participants in the Couples Arm Sample (Knobloch-Fedders, Pinsoff, & Mann,

2007; Symonds & Horvath, 2004). Multiple regression analyses indicated a significant relationship between WAI scores and dyadic adjustment (DAS) at 3-months post-baseline and between TIRS scores and adjustment at 9-months post-baseline. Women participating in couples therapy for alcohol dependence who reported and were rated to have strong alliances with their therapists were more likely to experience positive relationship functioning after treatment than those with weak alliances. However, support for this hypothesis is attenuated by the current study's failure to detect an association between alliance and relationship functioning as measured by the AOC.

Prior to the discussion of clinical and research implications, an important pattern detected in the current study's results warrants attention. Clear treatment modality differences emerged between the Individual and Couples Arms on a number of key variables, including the predictors of alliance formation, overall alliance strength, and the relationship between alliance and treatment outcome. In terms of predictors, alliance was found to be positively associated with pre-baseline motivation in the Individual, but not Couples, Arm and with the presence of one or more comorbid Axis I diagnoses in the Couples, but not Individual, Arm. Furthermore, the overall strength of alliance reported by the female patients in the Individual Arm was found to be significantly greater than that in the Couples Arm. And lastly, while strong therapeutic alliance was found to be significantly predictive of positive drinking-related outcomes in the Individual Arm, no such relationship was detected in the Couples Arm. Interesting, however, alliance in the Couples Arm was found to predict post-treatment relationship functioning, even though this was not a goal of treatment. The implications of these interesting treatment modality differences, as well as other study results, are now discussed.

#### *Clinical and Research Implications*

In addition to investigating alliance formation and its relationship with treatment outcome, the current study also created a new measure of therapeutic alliance, the TIRS-ARI. The sound psychometric properties exhibited by this instrument suggest that it is appropriate for use in subsequent research as observer-rated measure of alliance. However, limitations discussed below should be taken into consideration prior to the incorporation of this measure into subsequent research protocols.

Clinically, the current study provided evidence of the relationship between pre-baseline motivation and subsequent alliance formation among Individual Arm participants. Motivation for alcohol-related behavior change was found to be predictive of alliance strength across two indexes of motivation as well as both patient- and observer-rated measures of alliance. This finding is consistent with prior research in the substance abuse treatment literature (Connors et al., 2000; Joe, Simpson, & Broome, 1998) and more broadly in the therapeutic alliance literature (Henry & Strupp, 1994), and may reflect a “two-way street.” It is possible that therapists feel more confident working within an abstinence-based treatment model and, therefore, are more readily able to form strong therapeutic alliances with patients who identify such goals. Regardless of the mechanism of this association, the relationship between motivation and alliance formation has important treatment implications. Specifically, these results suggest that therapists may need to markedly increase alliance-enhancing behaviors (Ackerman & Hilsenroth, 2003) when patients present for individual substance abuse psychotherapy with a non-abstinence treatment goal or with low levels of problem recognition. Surprisingly, motivation as measured by the Taking Steps subscale of the SOCRATES was not found to be associated with alliance formation and this finding suggests that low

levels of alcohol-related behavior change reported by the patient may not necessarily indicate the need for additional alliance-enhancing behaviors on the part of the therapist.

Although motivation was not implicated in alliance formation among study participants in the Couples Arm Sample, other results suggest that similar adaptation of therapist behavior may also be necessary within the context of couples substance abuse therapy. Couples Arm participants had overall weaker alliances with their therapists than Individual Arm participants and this finding suggests the implementation of additional alliance-enhancing behaviors among therapists conducting couples substance abuse treatment. Thus, when women with alcohol dependence request the involvement of their male partner in treatment, alliance formation may be particularly challenging and require additional rapport-building efforts on the part of the therapist.

While the current study identified low motivation and partner involvement as potential impediments to alliance formation, the presence of Axis I and/or Axis II comorbidity among female participants was not found to similarly impede its formation in either treatment arm. This finding is consistent with prior research indicating that psychiatric comorbidity does not negatively impact alliance formation (Henry & Strupp, 1994; Meier, Barrowclough, & Donmall, 2005). In fact, women with one or more Axis I diagnoses in the Couples Arm of the current study were found to form *stronger* alliances than those without such diagnoses. It is possible that the validation and support that the patient received from her therapist regarding comorbid Axis I psychiatric symptomatology was even more meaningful when delivered in the presence of the patient's spouse. While not supported by prior research, this interpretation would account for the presence of a relationship between Axis I comorbidity and alliance formation in the Couples, but not Individual, Arm of the current study. This interesting finding also



overlaps with prior research by our team (McCrady, Epstein, Cook, Jensen, & Hildebrandt 2009) indicating that Axis I comorbidity was positively associated with treatment outcome among women participating in couples, but not individual, therapy for alcohol dependence. It is possible that alliance served to mediate this relationship between Axis I comorbidity and treatment outcome, and additional research is needed to clarify the nature of this association.

Prior research has also indicated that the presence of heavy drinking upon entry to treatment for alcohol dependence does not negatively impact alliance formation (Meier, Barrowclough, & Donmall, 2005) and, barring findings that were not maintained in regression analyses (DDD, SIP), results from the current study are largely consistent with this finding. Intuitively, these facets of patient presentation (i.e., heavy drinking, Axis I comorbidity) might be considered a liability in the creation and maintenance of the therapeutic relationship. The current study adds to an existing body of literature refuting this concern and suggesting that strong alliances may be developed even in the presence of complex clinical presentations.

One final aspect of alliance formation warrants attention. While the alliance literature provides some early indication that patients tend to report a preference for therapists of the same gender (Simons & Helms, 1976), results from the current study are consistent with those found by Zlotnick and colleagues (1998) and indicate that therapist gender was not associated with alliance strength. Importantly, this finding extended into the Female-Specific treatment condition of the clinical trial as well, where it could be supposed that a female therapist might have more readily navigated female-specific interventions than a male therapist. Male therapists' ability to form equally strong alliances female therapists provides further indication that gender "mismatch" between

patient and therapist need not necessarily inhibit the formation of a strong therapeutic alliance.

Clinical implications pertaining to findings from Aim 3 are clear: strong alliances increase the likelihood of positive treatment outcomes. Study results indicating that this relationship is present among women with alcohol dependence participating in individual and couples treatment builds upon similar findings within the substance abuse treatment literature (Connors, Carroll, DiClemente, Longabaugh, & Donovan, 1997), the couples therapy literature (Knobloch-Fedders, Pinsoff, & Mann, 2007; Symonds & Horvath, 2004), and more broadly the therapeutic alliance literature (Martin, Garske, & Davis, 2000). It is currently unclear why the relationship between alliance and drinking outcomes found in the Individual Arm did not extend to the Couples Arm and this interesting modality difference warrants further investigation. However, the unanticipated null finding in the Couples Arm related to drinking outcomes was accompanied by a similarly surprising finding linking alliance with improved relationship functioning. Alliance has been shown to matter across treatment orientations and modalities, clinical presentations, and outcome variables, and the current study provides evidence that this relationship extends to the unique population under consideration here. To the extent that therapists can foster strong therapeutic alliances with their female patients with alcohol dependence, treatment outcomes may be enhanced, be it in terms of alcohol consumption in an individual setting or relationship functioning in a couples setting.

### *Limitations*

A primary limitation of the current study is sample homogeneity. Roughly 96% of study participants identified themselves as Caucasian, with only seven out of 158

participants endorsing another racial identity. Participants were also on average highly educated and on average completed over three years of college. When compared to US census data, median household income in the current sample was almost two times greater than that of the general population (United States Census Bureau, 2006). It should be noted, however, that the state of New Jersey, where these data were collected, has the highest median income in the country and incomes in the current sample exceeded the state median to a lesser degree.

Sample homogeneity was in part influenced by the exclusion criteria established for the clinical trial. This study excluded women who were not in a committed, heterosexual relationship, who met DSM-IV-TR criteria for physiological dependence upon a substance other than alcohol and/or nicotine, who were abstinent from alcohol more than 30 days prior to the clinical screen, who exhibited current psychotic symptoms or organic deficits, and who reported severe domestic violence. Taken together, these characteristics of the study sample suggest the use of caution when generalizing results to other populations.

Another limitation of the current study pertains to sample size concerns among Couples Arm Sample analyses. While analyses conducted with the Full Sample ( $N = 158$ ) and Individual Arm Sample ( $N = 99$ ) either met or minimally violated sample size assumptions, those carried out with the Couples Arm Sample ( $N = 59$ ) were found to substantially violate these assumptions. When conducting multiple regression analyses, it is recommended that the ratio of cases to independent variables adhere to the following formula:  $N \geq 50 + 8x$ , where  $x$  represents the number of IVs to be included in the regression analysis (Tabachnick & Fidell, 2001). According to this formula, analyses conducted in the Couples Arm Sample exhibited substantial case deficiency, suggesting

the use of caution when interpreting statistically significant results. Specifically, Aim 3 analyses that found a significant association within the Couples Arm Sample between alliance and dyadic adjustment at 3- and 9-months post-baseline exhibited deficiencies of 27% and 44%, respectively. These case deficiencies may have artificially inflated the relationship detected between alliance and relationship functioning (Tabachnick & Fidell) and suggest the use of caution when interpreting their association.

It is also important to note that participants were not randomly assigned to study arms. Allocation to study arm was initially based on participant preference for individual or couples treatment and it was found that women overwhelmingly preferred *not* to involve their male partner in treatment. This preference resulted in too few participants in the Couples Arm and required that the final 42 women recruited for the study not be provided the option of individual treatment. These aspects of the clinical trial's design (McCrady, Epstein, Cook, Jensen, & Ladd, under revision) confer two limitations on the current study. First, while group differences detected between the Individual and Couples Arms were controlled for in the Full Sample regression analyses of Aims 2 and 3, it is possible that undetected confounding differences between these groups influenced the significant results found therein. Second, a similar concern is raised within the Couples Arm Sample; while regression analyses controlled for detected differences between those who chose and those who were assigned to the Couples Arm, undetected confounding differences between these groups may have impacted the relationship found between alliance and dyadic adjustment at follow up.

Two final limitations involve the measures of therapeutic alliance used in the current study. This study developed a new measure of alliance by selecting and examining alliance-related items from an observer-rated measure of treatment integrity

(TIRS). While psychometric analyses indicated that these items (TIRS-ARI) exhibited a singular factor structure as well as strong internal consistency and convergent validity, it is possible that they were tapping an alternate construct that, while related to alliance, is distinct from it. Psychometric convention prescribes that item and scale development be guided by theory as well as statistics (Cohen & Swerdlik, 2002) and the TIRS-ARI relied exclusively on the latter. This concern is mitigated by the fact that only one significant finding was detected using the TIRS-ARI, but suggests the use of caution in its interpretation. Furthermore, objective raters of the TIRS were not instructed to evaluate alliance *per se*; rather, they were trained on the identification and evaluation of *therapist behaviors* that, in the case of the Alliance-Related Items, were believed to be alliance-enhancing. This caveat should be considered prior to inclusion of the TIRS-ARI in subsequent research protocols.

The other measure of alliance used in the current study, the Working Alliance Inventory (WAI), was administered during the 3-month post-baseline follow up interview. Alliance is a construct that has been historically measured *during* treatment (Martin, Garske, & Davis, 2000) and it is possible that relying on participants' retrospective recall of their relationship with their therapist, after that relationship has ended, may have in some way biased reporting. However, the duration between the end of treatment and completion of the WAI was typically quite short (i.e., the 3-month follow-up visit was scheduled immediately after the 12<sup>th</sup> therapy session), thereby attenuating this concern. Also, this retrospective reporting on the WAI may have been influenced by clinical outcome; it is possible those participants who responded well to treatment may have rated alliance more favorably than those who responded poorly or

who dropped out. Were this the case, the WAI would have served more as a proxy measure of treatment outcome than a circumscribed measure of therapeutic alliance.

### *Future Directions*

Additional research is needed to clarify the relationship between motivation, therapeutic alliance, and treatment outcome among women participating in individual treatment for alcohol dependence. Mediation analyses were not conducted in the current study and future research would do well to utilize methods suggested by Kazdin and Nock (2003) to elucidate the relationship among these variables. The current study takes an important first step in this direction by providing evidence of the association between motivation and alliance formation, and between alliance and treatment outcome.

The current study also raised important questions regarding the relationship between comorbid Axis I psychopathology, alliance formation, and treatment outcome. Prior research has shown that the presence of comorbid Axis I diagnoses is associated with superior drinking outcomes among women participating in couples, but not individual, treatment for alcohol dependence (McCrary, Epstein, Cook, Jensen, & Hildebrandt 2009). The current study found that women in the Couples Arm with one or more comorbid Axis I diagnoses formed stronger alliances than those without such diagnoses. Taken together, these findings suggest that additional research is needed to explore the possibility that therapeutic alliance serves to mediate the relationship between Axis I comorbidity and drinking outcomes within couples treatment for alcohol dependence women.

Subsequent research in this area should also heed suggestions found in the alliance literature regarding optimal assessment of the construct. Specifically, it is recommended that assessment take place *during*, not after, the course of treatment and that alliance be

assessed from the perspective of the patient as well as objective observers (Horvath & Luborsky, 1993; Martin, Garske, & Davis, 2000; Tryon, Blackwell, & Hammel, 2007). This breadth of perspective, coupled with real-time assessment, will yield the most accurate and nuanced picture of the relationship between patient and therapist. Ideally, such research would utilize a large, demographically-heterogeneous, randomized sample of participants to enhance generalizability, ensure accuracy of findings, and prevent the over-estimation of effect size.

### *Conclusion*

The current study provided evidence that women who enter individual treatment for alcohol dependence with strong motivation for alcohol-related behavior change exhibit an increased likelihood of forming strong therapeutic alliances with their therapists. Additional findings indicated that women in individual treatment who report strong alliances exhibit an increase likelihood of maintaining abstinence from alcohol at 9- and 15-months post-baseline. These relationships were not detected among women participating in couples treatment. Treatment modality differences were also found indicating that Individual Arm participants reported significantly stronger alliances than Couples Arm participants and that Axis I comorbidity was positively associated with alliance formation in the Couples, but not Individual, Arm. Furthermore, tentative support (due to statistical concerns) is provided suggesting that women in couples treatment who report and are rated to have strong therapeutic alliances exhibit an increased likelihood of positive dyadic adjustment at 3- and 9-months post-baseline. Additional research is needed to clarify the relationship between motivation, Axis I comorbidity, therapeutic alliance, and treatment outcome among women participating in individual and couples treatment for alcohol dependence.

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# Appendix A: Treatment Integrity Rating Scale Alliance-Related Items (TIRS-ARI)

37.a.) REFLECTIVE LISTENING: To what extent did the therapist communicate understanding of the patient's comments and concerns via reflective listening?

1-----2-----3-----4-----5  
not at all      a little      somewhat      considerably      extensively

37.b.) Rate the quality of the delivery of this component regardless of whether protocol (i.e. CBT) appropriate.

1-----2-----3-----4-----5  
very poor      poor      adequate      good      excellent

---

38.a.) EXPLORATION OF FEELINGS: To what extent did the therapist help the client to explore her feelings related to current symptoms or clarify affect states as related to alcohol use or other target problems?

1-----2-----3-----4-----5  
not at all      a little      somewhat      considerably      extensively

38.b.) Rate the quality of the delivery of this component regardless of whether protocol (i.e. CBT) appropriate.

1-----2-----3-----4-----5  
very poor      poor      adequate      good      excellent

---

39.a.) SUPPORT FOR PATIENT EFFORTS: To what extent did the therapist support client efforts and promote the belief that it is possible for the client to change?

1-----2-----3-----4-----5  
not at all      a little      somewhat      considerably      extensively

39.b.) Rate the quality of the delivery of this component as specified in the manual:

1-----2-----3-----4-----5  
very poor      poor      adequate      good      excellent

---

## Appendix A: Treatment Integrity Rating Scale Alliance-Related Items (TIRS-ARI), cont.

43.a.) THERAPIST RAPPORT WITH WOMAN: To what extent did the therapist attempt to have a positive rapport with the woman?

1-----2-----3-----4-----5  
not at all      a little      somewhat      considerably      extensively

44.b.) Rate the quality of the therapist's rapport with the woman:

1-----2-----3-----4-----5  
very poor      poor      adequate      good      excellent

---

47.a.) EMPATHY:

- Conveys warmth and sensitivity
- Demonstrates genuine concern, is non-judgmental
- Understands and expresses patient's feelings and concerns

1-----2-----3-----4-----5  
not at all      a little      somewhat      considerably      extensively

47.b.) Rate the quality of the delivery of the therapist's empathy regardless of whether protocol appropriate.

1-----2-----3-----4-----5  
very poor      poor      adequate      good      excellent

---

## Appendix B: Working Alliance Inventory – Short Form – Client

(WAI-S-C; Tracey &amp; Kokotovic, 1989)

1.) \_\_\_\_\_ and I agree about the things I will need to do in therapy to help improve my situation.

1	2	3	4	5	6	7
Never	Rarely	Occasionally	Sometimes	Often	Very Often	Always

---

2.) What I am doing in therapy gives me new ways of looking at my problem.

1	2	3	4	5	6	7
Never	Rarely	Occasionally	Sometimes	Often	Very Often	Always

---

3.) I believe \_\_\_\_\_ likes me.

1	2	3	4	5	6	7
Never	Rarely	Occasionally	Sometimes	Often	Very Often	Always

---

4.) \_\_\_\_\_ does not understand what I am trying to accomplish in therapy.

1	2	3	4	5	6	7
Never	Rarely	Occasionally	Sometimes	Often	Very Often	Always

---

5.) I am confident in \_\_\_\_\_ 's ability to help me.

1	2	3	4	5	6	7
Never	Rarely	Occasionally	Sometimes	Often	Very Often	Always

---

6.) \_\_\_\_\_ and I are working towards mutually agreed upon goals.

1	2	3	4	5	6	7
Never	Rarely	Occasionally	Sometimes	Often	Very Often	Always

---

## Appendix B: Working Alliance Inventory (WAI), cont.

7.) I feel that \_\_\_\_\_ appreciates me.

1	2	3	4	5	6	7
Never	Rarely	Occasionally	Sometimes	Often	Very Often	Always

---

8.) We agree on what is important for me to work on.

1	2	3	4	5	6	7
Never	Rarely	Occasionally	Sometimes	Often	Very Often	Always

---

9.) \_\_\_\_\_ and I trust one another.

1	2	3	4	5	6	7
Never	Rarely	Occasionally	Sometimes	Often	Very Often	Always

---

10.) \_\_\_\_\_ and I have different ideas on what my problems are.

1	2	3	4	5	6	7
Never	Rarely	Occasionally	Sometimes	Often	Very Often	Always

---

11.) We have established a good understanding of the kind of changes that would be good for me.

1	2	3	4	5	6	7
Never	Rarely	Occasionally	Sometimes	Often	Very Often	Always

---

12.) I believe the way we are working with my problem is correct.

1	2	3	4	5	6	7
Never	Rarely	Occasionally	Sometimes	Often	Very Often	Always

---

Table 1

*Shapiro-Wilks Test of Normality, Skew, and Kurtosis Values Pre- and Post-Variable Modification: Full Sample (N = 158)*

Variable	Pre-Modification				Post-Modification			
	Shapiro-Wilks	Skew	Kurtosis		Shapiro-Wilks	Skew	Kurtosis	
WAI	W = .85 <i>p</i> = .000	S = -1.74 <i>SE</i> = .21	K = 4.11 <i>SE</i> = .42		W = .92 <i>p</i> = .000	S = -.84 <i>SE</i> = .21	K = .31 <i>SE</i> = .42	
Male Partner Drinks/Week	W = .72 <i>p</i> = .000	S = 2.54 <i>SE</i> = .19	K = 8.84 <i>SE</i> = .39		W = .93 <i>p</i> = .000	S = .39 <i>SE</i> = .19	K = -.97 <i>SE</i> = .39	
DDD BL	W = .81 <i>p</i> = .000	S = 2.53 <i>SE</i> = .18	K = 11.26 <i>SE</i> = .38		W = .98 <i>p</i> = .041	S = -.26 <i>SE</i> = .18	K = -.35 <i>SE</i> = .38	
DDD 003	W = .81 <i>p</i> = .000	S = 2.87 <i>SE</i> = .22	K = 14.15 <i>SE</i> = .43		W = .98 <i>p</i> = .020	S = -.31 <i>SE</i> = .22	K = -.07 <i>SE</i> = .43	
DDD 009	W = .82 <i>p</i> = .000	S = 2.16 <i>SE</i> = .23	K = 7.69 <i>SE</i> = .46		W = .98 <i>p</i> = .071	S = -.13 <i>SE</i> = .23	K = -.74 <i>SE</i> = .46	
DDD 015	W = .76 <i>p</i> = .000	S = 2.01 <i>SE</i> = .26	K = 3.89 <i>SE</i> = .49		W = .97 <i>p</i> = .000	S = .21 <i>SE</i> = .26	K = -.73 <i>SE</i> = .49	

Table 2

*Participant Characteristics: Full Sample and By Study Arm*

	Full Sample	Individual Arm	Couples Arm
N	158	99	59
Age - M ( <i>SD</i> )	47.2 (8.9)	47.8 (8.9)	45.9 (9.1)
Marital Status - Frequency (%)			
Married	127 (80.4%)	79 (79.8%)	48 (81.4%)
Living as if married	17 (10.8%)	8 (8.1%)	9 (15.3%)
Committed, non-cohabitating	14 (8.9%)	12 (12.1%)	2 (3.4%)
Ethnicity - % Hispanic/Latino	2.5%	4%	0%
Race - % White	95.6%	96%	94.9%
Religion - % Catholic	51.9%	53.5%	49.2%
Children - M ( <i>SD</i> )	1.7 (1.2)	1.9 (1.3)	1.6 (1.1)
Employment - % Full Time	41.8%	41.4%	42.4%
Years Education - M ( <i>SD</i> )	15.2 (2.6)	15.1 (2.5)	15.3 (2.6)
Household Income - Median	\$96,000	\$92,000*	\$103,500*
Spouse			
Age M ( <i>SD</i> )	48.9 (9.8)	49.7 (9.7)	47.6 (10.1)
Ethnicity - % Hispanic/Latin	2.5%	3%	1.7%
Race - % White	87.3%	84.8%	91.5%
Employment - % Full Time	80.4%	76.8%	86.4%
Years Education - M ( <i>SD</i> )	15.2 (2.8)	15.1 (3.0)	15.3 (2.4)

Note. \* $p \leq .05$

Table 3

*Varimax Rotated Factor Loadings of TIRS Items on Hypothesized Factor of Alliance by TIRS Item Component*

Item	Rotated Factor Loading	
	Quality	Quantity
37.) Reflective listening	.811	.747
38.) Exploration of feelings	.725	.788
39.) Support for patient efforts	.567	.671
43.) Therapist rapport with woman	.699	.666
47.) Empathy	.756	.687



Table 4

*Baseline Scores of Aim 2 Predictor Variables: Full Sample (N = 158), Individual Arm Sample (N = 99), and Couples Arm Sample (N = 59)*

	Full	Individual	Couples
SOC Rec – M (SD)	29.32 (4.4)	29.54 (4.5)	28.95 (4.1)
SOC TS – M (SD)	28.46 (6.9)	28.83 (7.7)	27.85 (5.5)
PDA – M (SD)	29.42 (27.1)	31.42 (28.8)	26.06 (23.8)
DDD – M (SD)	6.76 (4.1)	6.81 (3.9)	6.66 (4.5)
SIP – M (SD)	9.66 (3.1)	9.76 (3.1)	9.51 (3.1)
Abstinence Goal – %	43.7%	49.5%	33.9%
≥ 1 Axis I Diagnosis – %	42.4%	45.5%	37.3%
≥ 1 Axis II Diagnosis – %	34.2%	35.4%	32.2%
Gender Matching – %	73.4%	69.7%	79.7%
DAS – M (SD)	--	--	21.05 (6.7)
AOC – M (SD)	--	--	22.88 (14.9)
Male drinks/week – M (SD)	--	--	11.53 (14.75)
Chose Couples Arm – %	--	--	28.8

*Note.* SOC Rec = SOCRATES Recognition Subscale, SOC TS = SOCRATES Taking Steps Subscale, PDA = Percent Days Abstinent, DDD = Mean Drinks per Drinking Day, SIP = Short Inventory of Problems, DAS = Dyadic Adjustment Scale, AOC = Areas of Change Questionnaire. \* $p < .05$

Table 5

*Intercorrelations Among Baseline Predictor Variables and Measures of Alliance – Full Sample (N = 158)*

Measure	1	2	3	4	5	6	7
1. WAI	--	.30**	.12	.00	.11	.12	.01
2. TIRS-ARI		--	.05	-.01	.02	.07	-.01
3. SOC Rec			--	.34***	.20*	.32***	.57***
4. SOC TS				--	.42***	.01	.29***
5. PDA					--	.01	.17
6. DDD						--	.37***
7. SIP							--

*Note.* SOC Rec = SOCRATES Recognition Subscale, SOC TS = SOCRATES Taking Steps Subscale, PDA = Percent Days Abstinent, DDD = Mean Drinks per Drinking Day, SIP = Short Inventory of Problems. \* $p < .05$  \*\* $p < .01$  \*\*\* $p < .001$

Table 6

*Intercorrelations Among Baseline Predictor Variables and Measures of Alliance – Individual Arm Sample (N = 99)*

Measure	1	2	3	4	5	6	7
1. WAI	--	.24*	.31**	-.01	.09	.24*	.18
2. TIRS-ARI		--	.07	-.04	.00	.08	-.02
3. SOC Rec			--	.40***	.21*	.35***	.62***
4. SOC TS				--	.41***	.05	.37***
5. PDA					--	.05	.22
6. DDD						--	.38***
7. SIP							--

*Note.* SOC Rec = SOCRAATES Recognition Subscale, SOC TS = SOCRAATES Taking Steps Subscale, PDA = Percent Days Abstinent, DDD = Mean Drinks per Drinking Day, SIP = Short Inventory of Problems. \* $p < .05$  \*\* $p < .01$  \*\*\* $p < .001$

Table 7

*Intercorrelations Among Baseline Predictor Variables and Measures of Alliance – Couples Arm Sample (N = 59)*

Measure	1	2	3	4	5	6	7	8	9	10
1. WAI	--	.39*	-.24	-.06	.05	-.21	-.31*	.19	-.07	-.13
2. TIRS-ARI		--	-.01	.12	.04	.04	.00	.16	.05	.19
3. SOC Rec			--	.17	.16	.27*	.48***	.07	-.08	-.09
4. SOC TS				--	.45***	-.10	.11	-.04	.04	.09
5. PDA					--	-.09	.10	-.15	.19	-.12
6. DDD						--	.37**	.07	.00	.19
7. SIP							--	-.28*	.39**	.18
8. DAS								--	-.73***	-.14
9. AOC									--	.21
10. Male Dr/Wk										--

*Note.* SOC Rec = SOCRATES Recognition Subscale, SOC TS = SOCRATES Taking Steps Subscale, PDA = Percent Days Abstinent, DDD = Mean Drinks per Drinking Day, SIP = Short Inventory of Problems, DAS = Dyadic Adjustment Scale, AOC = Areas of Change Questionnaire, Male Dr/Wk = Male Partner Drinks per Week. \* $p < .05$  \*\* $p < .01$  \*\*\* $p < .001$

Table 8

*Summary of Simultaneous Regression Analysis for Variables Predicting the Formation of Therapeutic Alliance: Individual Arm Sample (N = 99)*

Variable	<i>B</i>	<i>SE B</i>	$\beta$
Constant	54.33	5.09	--
SOC Rec	.49	.21	.32*
SOC TS	-.14	.12	-.15
PDA	.02	.03	.09
DDD	-.07	.31	-.03
SIP	-.07	.31	-.03

*Note.*  $R^2 = .14$ ,  $p = .04$ . \* $p < .05$

Table 9

*Analysis of Covariance: Working Alliance Inventory (WAI) Total Scores by Abstinence Goal and Household Income, Full Sample (N = 130)*

Variable	<i>M (SD)</i>	<i>df</i>	<i>F</i>	<i>p</i>
Household Income	--	1	1.5	.22
Abstinence Goal		1	5.0	.03
Abstinence	67.9 (7.0)			
Non-abstinence	64.4 (7.9)			
Error	--	127	--	--

Table 10

*Analysis of Variance: Working Alliance Inventory (WAI) Total Scores by Abstinence Goal, Individual Arm Sample (N = 84)*

Variable	<i>M (SD)</i>	<i>df</i>	<i>F</i>	<i>p</i>
Abstinence Goal		1	10.1	.002
Abstinence	69.7 (5.7)			
Non-abstinence	65.2 (7.2)			
Total	--	83	--	--

Table 11

*Analysis of Covariance: Treatment Integrity Rating Scale (TIRS) Total Scores by Abstinence Goal and Household Income, Full Sample (N = 128)*

Variable	<i>M (SD)</i>	<i>df</i>	<i>F</i>	<i>p</i>
Household Income	--	1	.7	.4
Abstinence Goal		1	4.7	.03
Abstinence	19.3 (2.0)			
Non-abstinence	18.6 (2.0)			
Error	--	125	--	--



Table 12

*Analysis of Covariance: Working Alliance Inventory (WAI) Total Scores by Study Arm and Household Income, Full Sample (N = 130)*

Variable	<i>M (SD)</i>	<i>df</i>	<i>F</i>	<i>p</i>
Household Income	--	1	1.9	.17
Study Arm		1	6.8	.01
Individual	67.3 (7.2)			
Couples	63.4 (8.1)			
Error	--	127	--	--

Table 13

*Analysis of Covariance: Treatment Integrity Rating Scale (TIRS) Total Scores by Axis I Comorbidity and SOCRATES Problem Recognition (SOC Rec) Subscale Score, Couples Arm Sample (N = 48)*

Variable	<i>M (SD)</i>	<i>df</i>	<i>F</i>	<i>p</i>
SOC Rec	--	1	.03	.86
Axis I Diagnosis		1	5.9	.02
One or more	19.7 (1.6)			
Zero	18.4 (1.7)			
Error	--	45	--	--

Table 14

*Descriptive Statistics of Aim 3 Outcome Variables: Full Sample (N = 158), Individual Arm Sample (N = 99), and Couples Arm Sample (N = 59)*

	Full	Individual	Couples
PDA BL	29.42 (27.1)	31.42 (28.8)	25.80 (23.1)
PDA 003	64.86 (32.0)	66.01 (31.4)	67.78 (33.4)
PDA 009	65.81 (32.2)	67.22 (31.5)	63.25 (33.7)
PDA 015	63.78 (34.2)	63.58 (33.3)	64.16 (36.3)
DDD BL	6.76 (4.1)	6.81 (3.9)	6.66 (4.5)
DDD 003	4.50 (3.2)	4.50 (3.6)	4.49 (2.3)
DDD 009	4.32 (3.2)	4.30 (3.6)	4.35 (2.4)
DDD 015	4.56 (3.8)	4.54 (3.7)	4.6 (3.9)
SIP BL	9.66 (3.1)	9.76 (3.1)	9.51 (3.1)
SIP 003	7.31 (4.8)	7.33 (4.7)	7.29 (4.9)
SIP 009	6.18 (3.1)	5.70 (4.8)	6.98 (4.5)
SIP 015	6.31 (5.2)	6.55 (5.0)	5.88 (5.6)

*Note.* SOC Rec = SOCRATES Recognition Subscale, SOC TS = SOCRATES Taking Steps Subscale, PDA = Percent Days Abstinent, DDD = Mean Drinks per Drinking Day, SIP = Short Inventory of Problems.

Table 14, cont.

*Descriptive Statistics of Aim 3 Outcome Variables: Full Sample (N = 158), Individual Arm Sample (N = 99), and Couples Arm Sample (N = 59)*

	Full	Individual	Couples
DAS BL	--	--	21.05 (6.7)
DAS 003	--	--	21.88 (6.1)
DAS 009	--	--	21.69 (7.1)
DAS 015	--	--	21.69 (7.1)
AOC BL	--	--	22.88 (14.9)
AOC 003	--	--	19.37 (14.8)
AOC 009	--	--	19.76 (14.9)
AOC 015	--	--	16.46 (13.7)

*Note.* DAS = Dyadic Adjustment Scale, AOC = Areas of Change Questionnaire.

Table 15

*Intercorrelations Among Measures of Alliance and Drinking-related Treatment Outcome – Full Sample (N = 158)*

Measure	1	2	3	4	5	6	7	8	9	10	11
1. WAI	--	.30**	.19*	.22*	.19*	-.05	-.04	.10	-.06	-.16	-.05
2. TIRS-ARI		--	.05	.15	.11	.04	.12	.21	-.06	.02	.00
3. PDA 003			--	.62***	.55***	-.18*	-.13	-.07	-.26**	-.39***	-.16
4. PDA 009				--	.78***	-.12	-.19*	-.15	-.14	-.45***	-.39**
5. PDA 015					--	-.01	.03	-.11	-.09	-.29**	-.43**
6. DDD 003						--	.66***	.56***	.36***	.28**	.19
7. DDD 009							--	.68***	.48***	.59***	.41**
8. DDD 015								--	.38***	.48***	.53**
9. SIP 003									--	.57***	.58**
10. SIP 009										--	.62**
11. SIP 015											--

*Note.* WAI = Working Alliance Inventory, TIRS-ARI = Treatment Integrity Rating Scale Alliance-Related Items, SOC Rec = SOCRAATES Recognition Subscale, SOC TS = SOCRAATES Taking Steps Subscale, PDA = Percent Days Abstinent, DDD = Mean Drinks per Drinking Day, SIP = Short Inventory of Problems. \* $p < .05$  \*\* $p < .01$  \*\*\* $p < .001$  \* $p < .05$  \*\* $p < .01$  \*\*\* $p < .001$

Table 16

*Intercorrelations Among Measures of Alliance and Drinking-related Treatment Outcome – Individual Arm Sample (N = 99)*

Measure	1	2	3	4	5	6	7	8	9	10	11
1. WAI	--	.24*	.19	.28*	.34**	.08	.11	.24	-.07	.01	-.03
2. TIRS-ARI		--	.05	.19	.08	.12	.23	.35*	.01	.19	.12
3. PDA 003			--	.65***	.64***	-.19	-.09	-.07	-.26*	-.46***	-.17
4. PDA 009				--	.79***	-.10	-.20	-.13	-.10	-.46***	-.39**
5. PDA 015					--	-.04	.09	.01	-.05	-.31*	-.38**
6. DDD 003						--	.69***	.60***	.32**	.26*	.14
7. DDD 009							--	.69***	.42***	.55***	.47**
8. DDD 015								--	.27***	.47***	.39**
9. SIP 003									--	.47***	.57**
10. SIP 009										--	.64**
11. SIP 015											--

*Note.* WAI = Working Alliance Inventory, TIRS-ARI = Treatment Integrity Rating Scale Alliance-Related Items, SOC Rec = SOCRAATES Recognition Subscale, SOC TS = SOCRAATES Taking Steps Subscale, PDA = Percent Days Abstinent, DDD = Mean Drinks per Drinking Day, SIP = Short Inventory of Problems. \* $p < .05$  \*\* $p < .01$  \*\*\* $p < .001$

Table 17

*Summary of Hierarchical Regression Analysis: Working Alliance Inventory (WAI) Predicting Percent Days Abstinent (PDA) at 9-Months Post-Baseline, Controlling for Pre-Baseline PDA and Median Household Income, Full Sample (N = 121)*

Variable	<i>B</i>	<i>SE B</i>	$\beta$
Step 1			
Constant	52.87	5.46	--
PDA BL	.42	.10	.36***
Income	1.22	.00	.03
Step 2			
Constant	2.21	24.98	--
PDA BL	.39	.10	.33***
Income	2.39	.00	.06
WAI	.76	.37	.18*

*Note.*  $R^2 = .13$ ,  $p < .001$  for Step 1;  $\Delta R^2 = .03$ ,  $p = .04$  for Step 2. \* $p < .05$  \*\*\* $p < .001$

Table 18

*Summary of Hierarchical Regression Analysis: Working Alliance Inventory (WAI) Predicting Percent Days Abstinent (PDA) at 9-Months Post-Baseline, Controlling for Pre-Baseline PDA, Individual Arm Sample (N = 78)*

Variable	<i>B</i>	<i>SE B</i>	$\beta$
Step 1			
Constant	54.86	4.80	--
PDA BL	.42	.12	.39***
Step 2			
Constant	-14.51	32.64	--
PDA BL	.39	.11	.35**
WAI	1.04	.49	.22*

*Note.*  $R^2 = .15, p < .001$  for Step 1;  $\Delta R^2 = .05, p = .035$  for Step 2. \* $p < .05$  \*\* $p < .01$  \*\*\* $p < .001$



Table 19

*Summary of Hierarchical Regression Analysis: Working Alliance Inventory (WAI) Predicting Percent Days Abstinent (PDA) at 15-Months Post-Baseline, Controlling for Pre-Baseline PDA, Individual Arm Sample (N = 75)*

Variable	<i>B</i>	<i>SE B</i>	$\beta$
Step 1			
Constant	49.37	4.92	--
PDA BL	.48	.12	.44***
Step 2			
Constant	-44.42	31.79	--
PDA BL	.45	.11	.41***
WAI	1.40	.47	.29**

*Note.*  $R^2 = .19, p < .001$  for Step 1;  $\Delta R^2 = .09, p = .004$  for Step 2. \*\* $p < .01$  \*\*\* $p < .001$

Table 20

*Summary of Hierarchical Regression Analysis: Working Alliance Inventory (WAI) Predicting Percent Days Abstinent (DAS) at 3-Months Post-Baseline, Controlling for Pre-Baseline DAS and SOCRATES Recognition (SOC Rec) Scores, Couples Arm Sample (N = 48)*

Variable	<i>B</i>	<i>SE B</i>	$\beta$
Step 1			
Constant	11.05	4.04	--
DAS BL	.73	.08	.80***
SOC Rec	-.16	.13	-.11
Step 2			
Constant	-1.84	5.78	--
DAS BL	.68	.08	.75***
SOC Rec	-.07	.13	-.05
WAI	.18	.06	.26**

*Note.*  $R^2 = .64, p < .001$  for Step 1;  $\Delta R^2 = .06, p = .005$  for Step 2. \*\*  $p < .01$  \*\*\*  $p < .001$

Table 21

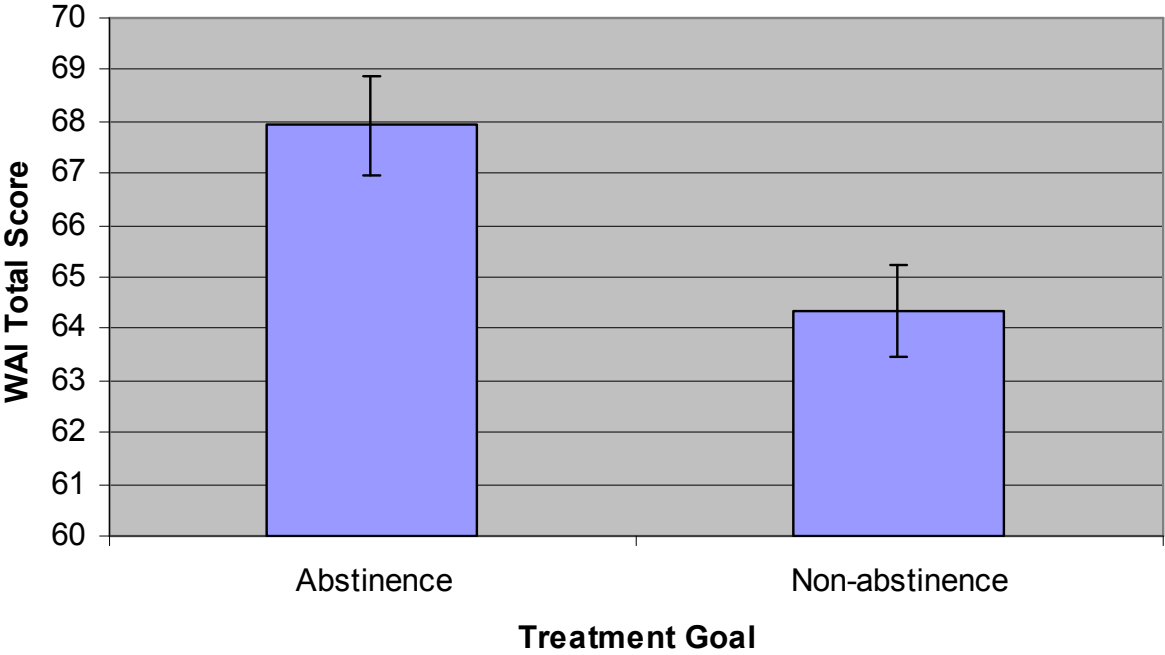
*Summary of Hierarchical Regression Analysis: Treatment Integrity Rating Scale Alliance-Related Items (TIRS-ARI) Predicting Percent Days Abstinent (DAS) at 9-Months Post-Baseline, Controlling for Pre-Baseline DAS and SOCRATES Recognition (SOC Rec) Scores, Couples Arm Sample (N = 37)*

Variable	<i>B</i>	<i>SE B</i>	$\beta$
Step 1			
Constant	5.37	5.98	--
DAS BL	.81	.12	.76***
SOC Rec	-.06	.19	-.04
Step 2			
Constant	-15.25	9.19	--
DAS BL	.71	.11	.67***
SOC Rec	-.09	.18	-.05
TIRS-ARI	1.27	.45	.29**

*Note.*  $R^2 = .58, p < .001$  for Step 1;  $\Delta R^2 = .08, p = .009$  for Step 2. \*\*  $p < .01$  \*\*\*  $p < .001$

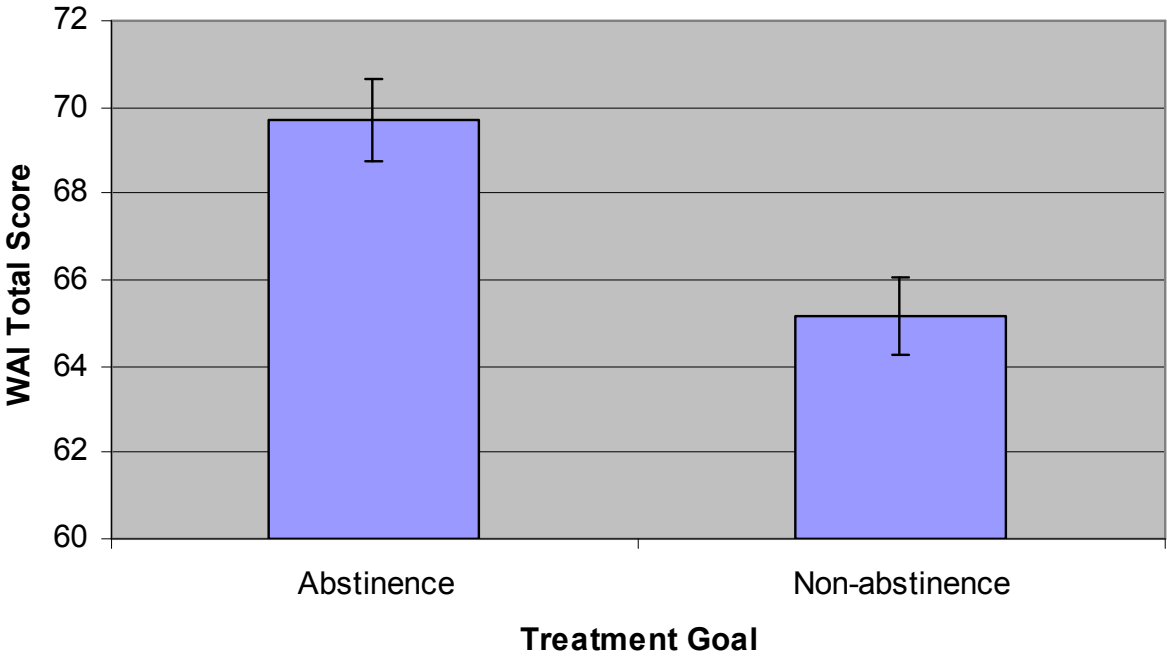
## Figure Caption

*Figure 1.* Mean Working Alliance Inventory (WAI) Total Score as a function of abstinence versus non-abstinence treatment goal: Full Sample ( $N = 130$ ).



## Figure Caption

*Figure 2.* Mean Working Alliance Inventory (WAI) Total Score as a function of abstinence versus non-abstinence treatment goal: Individual Arm Sample ( $N = 84$ ).



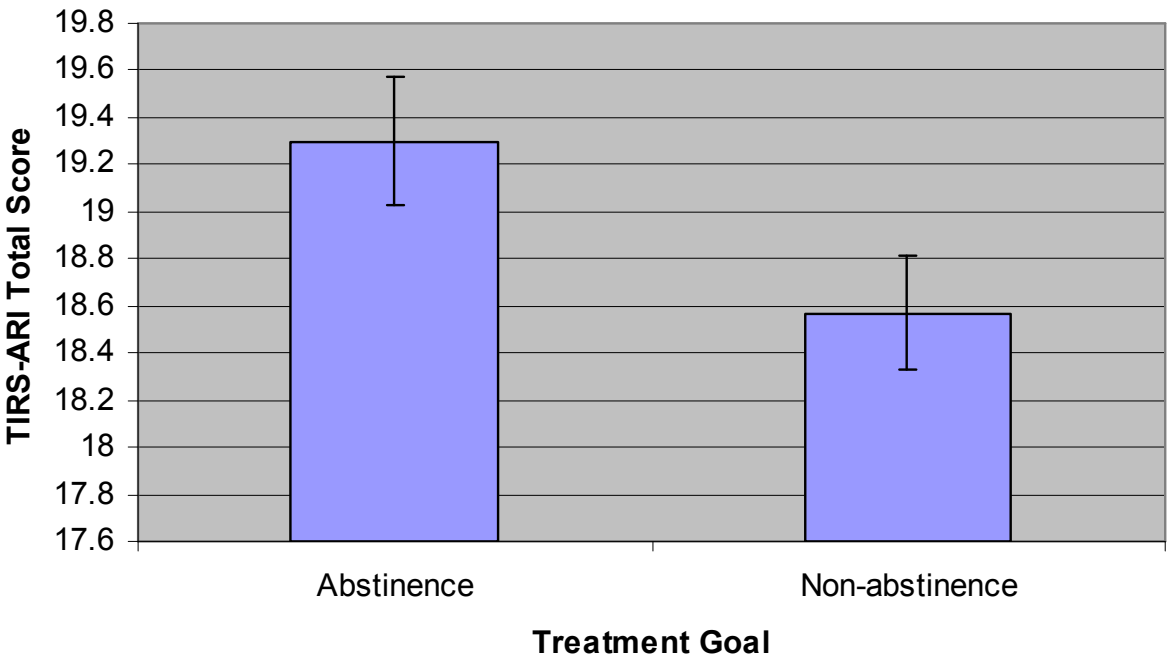
## Figure Caption

*Figure 3.* Mean Treatment Integrity Rating Scale Alliance-Related Items (TIRS-ARI)

Total Score as a function of abstinence versus non-abstinence treatment goal: Full Sample

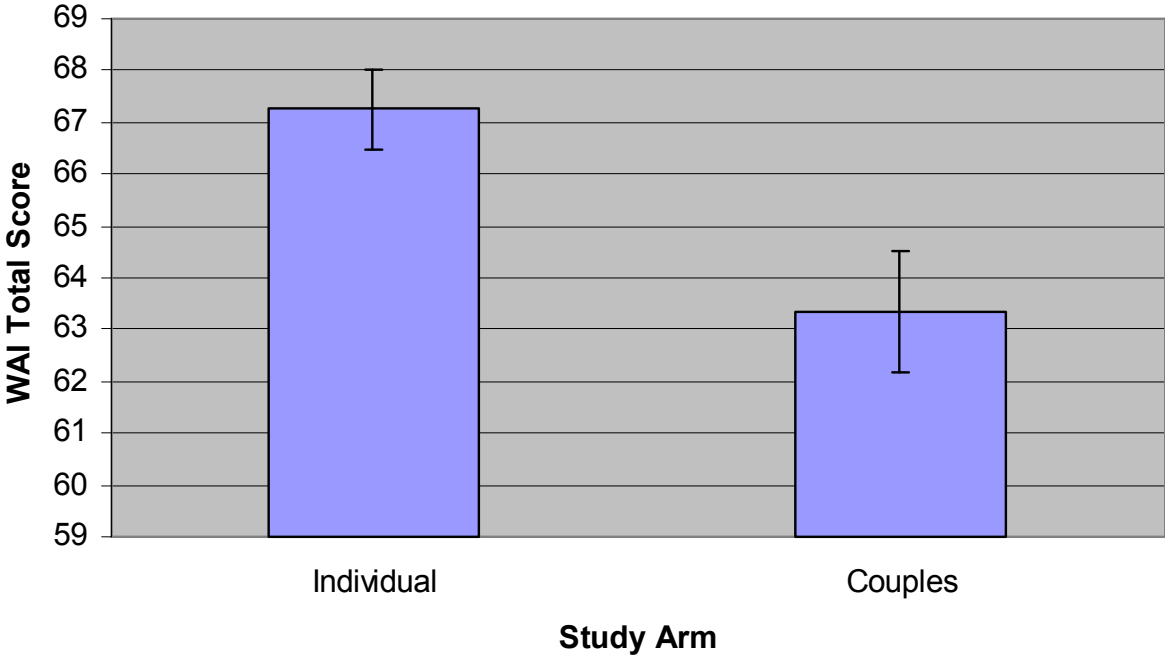
( $N = 128$ ).





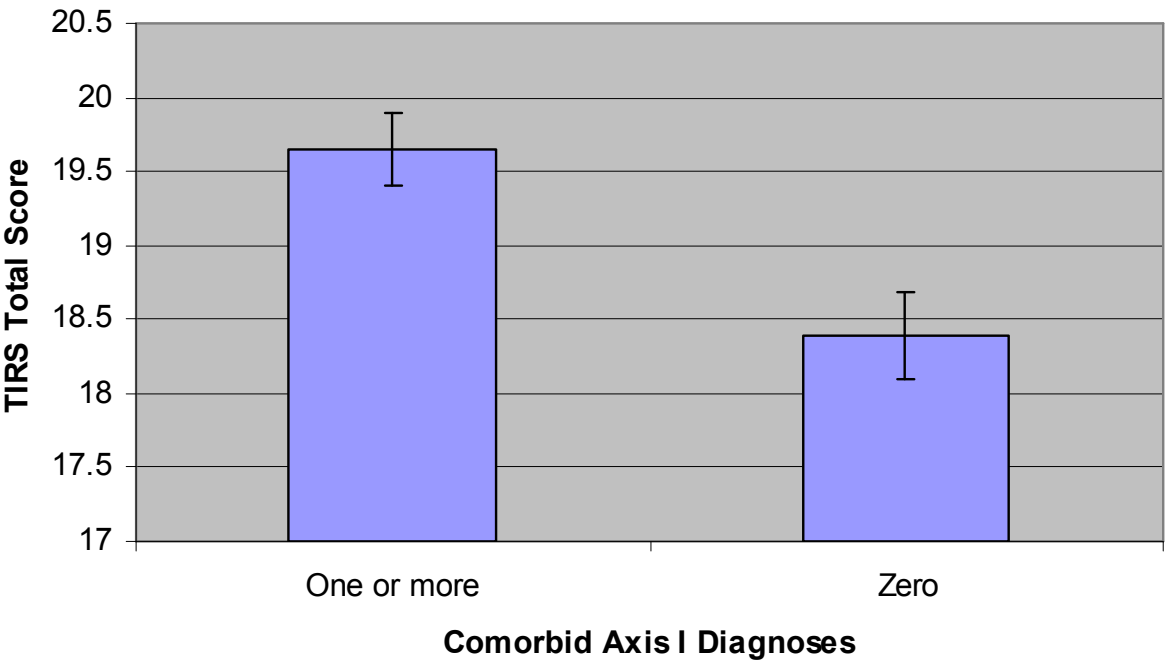
## Figure Caption

*Figure 4.* Mean Working Alliance Inventory (WAI) Total Score as a function of study arm: Full Sample ( $N = 130$ ).



## Figure Caption

*Figure 5.* Mean Treatment Integrity Rating Scale Alliance-Related Items (TIRS-ARI) Total Score as a function of presence of Axis I psychiatric comorbidity: Couples Arm Sample ( $N = 48$ ).



# David P. Menges, M.S.

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## CURRICULUM VITAE

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### EDUCATIONAL HISTORY

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Ph.D.	Rutgers, The State University of New Jersey (Anticipated: 10/2010),
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### BIBLIOGRAPHY

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#### PUBLICATIONS

- Menges, D. P.** (in preparation). Posttraumatic stress disorder, mild traumatic brain injury, and substance use disorders: Comorbidity among OIF/OEF military personnel and veterans. Manuscript in preparation.
- Menges, D. P.** (in preparation). Understanding the therapeutic alliance. Manuscript in preparation.
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- MacKillop, J., **Menges, D. P.**, McGeary, J. E., & Lisman, S. A. (2007). Effects of craving and DRD4 VNTR genotype on the relative value of alcohol: An initial human laboratory study. *Behavioral and Brain Functions*, *3*, 1-12.

#### SYMPOSIA

- Epstein, E. E., **Menges, D. P.**, Hunter-Reel, D. (2007, November). *The role of therapeutic alliance in behavioral couples therapy for alcohol dependent women*. Symposium presented at the annual meeting of the Association for Behavioral and Cognitive Therapies, Philadelphia, PA.
- Murphy, J. G., deWit, H., MacKillop, J., **Menges, D. P.**, O'Hagen, S., Lisman, S. A., Correia, C., Little, C., Benson, T. A., Henslee, A. M., Barnett, N. P., Colby, S. M., & Vuchinich, R. E. (2006, June). *Translational research on alcohol misuse using behavioral economics*. Symposium presented at the annual meeting of the Research Society on Alcoholism, Baltimore, MD.