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Typology of Couples Entering Alcohol Behavioral Couple Therapy: An Empirical Approach and Test of Predictive Validity on Treatment Response

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Typology of Couples Entering Alcohol Behavioral Couple Therapy: An Empirical

Approach and Test of Predictive Validity on Treatment Response

BY

Benjamin Olson Ladd

B.S., Psychology, Brown University, 2006

M.S., Clinical Psychology, University of New Mexico, 2010

DISSERTATION

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Abstract

Behavioral Couple Therapy (BCT) has garnered considerable empirical support for its efficacy in resolving marital conflict. BCT also has documented success in treating individual health problems, including alcohol use disorders (AUDs). Consistent with the larger BCT framework, Alcohol Behavioral Couple Therapy (ABCT) theory considers social interactions and exchanges in response to alcohol as critical antecedents and reinforcers of alcohol use. Thus, the purported mechanisms behind such components (e.g. positive reciprocity, leveling & editing) are based on the implicit assumption that the relationships of individuals where one partner has a problem with alcohol work similarly to those in distressed couples which neither partner has an alcohol problem. However, this assumption has yet to be tested directly; thus, the aim of the current study was to test whether classification of the presentation of couples in which one partner has an alcohol problem provides similarly meaningful information to what has been documented in the general couples literature. Specifically, typologies of couples seeking ABCT ($N = 169$) were examined and compared to couple typologies found in previous research on

community samples of couples. Additionally, this study aimed to build on the couple typology findings by examining whether typology at the start of treatment predicted alcohol treatment response and outcome. Results suggest that four types of couples can be reliably established in couples seeking ABCT and these couple types resemble couples types found in previous research. Couple type was associated with baseline relationship satisfaction; however, no evidence was found that couple type is associated with alcohol use outcome. The implications of these findings are discussed in the context of general couple therapy and ABCT specifically.

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Introduction

The Importance of Intimate Relationship Distress and Dissatisfaction

The vast majority of individuals will participate in a committed intimate relationship at some point in their lives. In the U.S., over 90% of people get married prior to the age of 50 (United Nations Economic and Social Affairs Population Division, 2009). At the same time, though many people are involved committed relationships, a significant number of those relationships become distressed at some point. As one indicator of relationship distress, roughly one in five Americans 15 years of age or older has been divorced, with that percentage rising to over a third (36.5%) of individuals 69 years or older (Kreider & Ellis, 2011). Overall, approximately 50% of married couples end up divorcing (Kreider & Fields, 2002). Although divorce serves as an ultimate symptom of relationship distress, it fails to take into account relationships in which spouses remain married despite significant conflict for a variety of reasons (children, religious beliefs, etc.) or committed relationships in which the partners were not considered married (e.g., according to the U.S. Census Bureau, 2009, 8% of couple households are cohabiting couples). Thus, the prevalence of relationship distress is likely much greater than the index of divorce rates would suggest.

Regardless of the exact rate, relationship distress and conflict are widespread and the consequences of relationship distress are well-established. Not surprisingly, relationship discord is associated with a range of psychiatric disorders. For example, compared to the general population individuals experiencing marital discord have a 2.7-fold increase in risk for meeting criteria for a major depressive episode (Whisman & Bruce, 1999) and a 3.7-fold increase in risk for meeting criteria for an alcohol use

disorder (AUD: Whisman, Uebelacker, & Bruce, 2006). Relationship distress also is associated with medical consequences, including decreased life expectancy and increased physical health problems (Kiecolt-Glaser & Newton, 2001). In addition to a range of negative health consequences, relationship distress also is significantly associated with reduced work productivity and decreased work performance, resulting in an estimated annual financial cost of 6.8 billion dollars (Forthofer, Markman, Cox, Stanley, & Kessler, 1996). The negative consequences of relationship distress are quite serious and impact not only the partners directly involved, but also the larger social network, including friends and family.

Presentation of Distressed Couples

      Distressed versus nondistressed couples. Due to the importance and need to treat relationship distress, a sizable body of literature documenting the topography of distressed couples exists. In a comprehensive review of research on the observation of couple interactions, Heyman (2001) put forth several "stubborn facts" regarding the presentation of distressed couples. Compared to nondistressed couples, partners of distressed couples express more hostile communication, are more likely to start their conversations with hostility, and are more likely to reciprocate and escalate their partner's hostility. Gottman (1994) succinctly described categories of negative and hostile communication as the "four horsemen of the apocalypse": criticism, defensiveness, contempt, stonewalling. The presence of these behaviors during couple interaction tasks predicts relationship stability and satisfaction. Interestingly, the expression of positive affect during communication is very important in predicting positive marital outcomes independent of the presence and/or extent of negative affect

(Gottman & Notarius, 2000). Thus, distressed couples are distinguished not only by higher levels of negative affect but also by lower levels of positive affect; negative and positive affect appear to be orthogonal measures of communication rather than opposite ends of the same dimension.

Gottman's (1993) four couple types. Building on the research examining the differences in communication between distressed and nondistressed couples, some researchers have advocated for the utility of couple typologies. Olson (1981) suggested that typologies of marriage have significant promise for bridging the gaps among theory, research, and practice as such classification methods use a couple-oriented approach rather than a variable-oriented one. Fisher & Ransom (1995) extended Olson's ideas, arguing that typologies of couples are underappreciated as such classifications provide ways to integrate a variety of information into clinically useful descriptions. In one of the first studies to use observational data to define couple typologies via empirical methods, Gottman (1993) examined coding data collected during a laboratory interaction task that categorized the behavior of each partner as either positive or negative. Outcomes were assessed at four years and defined as either divorce or serious consideration of divorce during the follow-up time period. In this community sample of 79 couples, Gottman (1993) found four types of couples: engager, avoider, hostile, and hostile-detached. Engager and avoider couples were more stable (i.e. less likely to have divorced or considered divorce) and had a greater ratio of positive to negative behaviors than the hostile and hostile-detached couples. Within the stable couples, Gottman further broke down the engager couples into validator or volatile based on clinical observation and empirical validation. The three types of stable couples were differentiated by their

expression of positive and negative affect during their interactions. Although maintaining a greater frequency of positive to negative behaviors overall compared to unstable couples, volatile couples expressed high levels of both positive and negative affect, validator couples expressed moderate levels of positive and negative affect, and avoider couples expressed low levels of both positive and negative affect. Table 1 provides a concise description and comparison of the four couple types found by Gottman (1993).

Support for Gottman's findings. The findings from a number of other studies on typologies of marital couples map onto the results from Gottman (1993). In a rare replication study on couple types, Gottman's couple types were observed by other researchers using self-report survey data (Holman & Jarvis, 2003). Using two samples, one of married couples and one of unmarried couples, Holman and Jarvis were able to replicate Gottman's couple types and found that couple type was related to relationship quality outcome variables as would be expected based on Gottman's results. One slight difference was that Gottman found no differences in relationship quality across stable couples (validator, volatile, and avoider), but in the replication study it was observed that validator couples reported the highest relationship quality with volatile and avoider couples reporting slightly lower relationship quality. In both studies, hostile couples had the lowest relationship quality. Although not a direct replication study, another cluster analysis of observational, self-report, and behavioral data of 164 couples, researchers found support for four types of couples: balanced, traditional, disconnected, and emotionally-strained (Fisher & Ransom, 1995). The balanced couples scored moderately on all variables and worked well together to solve problems and resolve conflict. Traditional couples were similar to balanced couples in many ways, although they tended

to be slightly less efficient in problem-solving despite high levels of satisfaction. Disconnected couples engaged in above average emotional avoidance and tended to look outside the relationship for support and intimacy. Emotionally-strained couples exhibited frequent hostility and tension and had poor conflict-resolution skills. A similar pattern of four types of couples emerged in a sample of 5,030 premarital couples who completed a self-report assessment of multiple relationship areas (Fowers & Olson, 1992). In this study, researchers named their couple typologies as: vitalized, harmonious, traditional, and conflicted. Vitalized couples were characterized by high relationship quality across the dimensions assessed. Harmonious couples presented with moderate overall relationship quality, with an emphasis on immediate intra-relationship variables (e.g., Communication) over longer-term ones (e.g., Children and Parenting). Traditional couples emphasized traditional couple concerns (e.g., Children and Parenting, Realistic Expectations) with moderate-to-low relationship satisfaction. Conflicted couples scored low on all variables, yet were committed to the marriage despite clear relationship difficulties.

A number of other investigations into the typology of marital couples have resulted in conceptually similar groups of couples (Givertz et al., 2009; Kamp Dush & Taylor, 2012; Lavee & Olson, 1993; Olson & Fowers, 1993; Ridley, Wilhelm, & Surra, 2001; Snyder & Smith, 1986). Although the concurrent validity of these couple types suggests four types of couples that differ significantly on a number of relationship dimensions, interactions, and/or behaviors, the evidence for the predictive validity of couple typologies remains relatively limited. Most of the studies investigating couple typologies have utilized cross-sectional data, thus confirming the concurrent validity of

such typologies rather than examining the predictive power of such typologies, which would be more interesting and potentially more useful from a clinical perspective. Gottman (1993) used outcome data collected four years after initial assessment, and found that his couple types significantly predicted whether couples divorced or seriously considered divorce. However, this difference was along the dimension of satisfaction only (i.e. hostile couples differed from validator, volatile, and avoider couples). The results from one study considering couple typologies using a 20-year longitudinal survey design found support for the findings summarized above, such that examination of the trajectories of couple conflict and satisfaction resulted in distinct groups of couples (Kamp-Dush & Taylor, 2011). Examination of these trajectories led Kamp-Dush and Taylor to identify four types of marriages: volatile (moderate-to-high happiness/high conflict), validator (moderate-to-high happiness/moderate conflict), avoider (moderate-to-high happiness/low conflict), and hostile (low happiness across all conflict levels). However, this study did not examine the predictive validity of couple typology; it simply used longitudinal data to establish the couple typologies.

Summary of evidence on the presentation of couples. The body of evidence reviewed above has led some researchers recently to state that

> [i]t is now well established that there are distinct types of marriages, identifiable by such variables as ideology, communication patterns, and expression of affect… What is particularly remarkable about these findings is that different researchers using vastly different methods have produced results that generally converge on a similar profile of the different types of naturally occurring marriages. (Givertz, Segrin, & Hanzal, 2009, p. 561)

Ultimately, the current body of evidence suggests that four types of conceptually distinct couples exist in the general population. These can be grouped hierarchically into satisfied and dissatisfied couples. Dissatisfied couples tend to present similarly to Gottman's (1993) hostile couples, with high expression of negative behaviors relative to positive behaviors, poor communication skills, and deficits in conflict-resolution and problem-solving. Within the satisfied couples, there appear to be three categories of couples. One group presents with moderate levels of relationship satisfaction and exhibits strong conflict-resolution and communication skills, and thus tends to avoid expression of extreme negative affect. These couples match best onto Gottman's validator couples. The second group of satisfied couples tends to express high levels of both positive and negative affect and has high levels of satisfaction despite some deficits in conflict-resolution and problem-solving skills. This group of couples presents similarly to Gottman's volatile couples. Finally, there are couples that endorse moderate relationship satisfaction and tend to avoid conflict, leading to moderate-to-low levels of both positive and negative affect. These couples are described by Gottman's avoider couples.

Despite some important gaps, the current evidence suggests that classification of couples based on their initial presentation provides meaningful information and is associated with relationship satisfaction and stability in naturalistic studies. Interestingly, couple typologies have not been explored in treatment studies, despite the potential clinical utility of such information. Therefore, the current study aimed to examine the concurrent and predictive validity of couple typologies in a sample of treatment-seeking couples. Such an examination could provide important information on couple typologies and add to the research on why some couples respond to therapy and others do not.

However, before exploring this question further, it is helpful to review the current status of couple therapy.

Status of Empirically Supported Couple Therapy

Relationship distress is a major issue that affects a large portion of the population at some point in their lives, and the negative consequences of such interpersonal conflict can be quite serious and damaging. Thus, it should come as no surprise that a number of interventions and therapies designed to alleviate and resolve intimate relationship distress exist. Despite a proliferation of couple therapy approaches, only two treatments have been studied scientifically with sufficient rigor that they can be considered empirically supported. These treatments are Emotion Focused Therapy (EFT) and Behavioral Couple Therapy (BCT). For the purposes of the current study, the term BCT will encompass both traditional and integrative BCT, an adaptation of traditional BCT that includes an acceptance component. Research has shown that these two versions of BCT have similar efficacy (Christensen et al., 2004; 2010). Of note, a third treatment, Insight-Oriented Couple Therapy (IOCT) has some empirical support as well, but research remains limited at present. In fact, Lebow and colleagues (2012) made the case for limiting couple therapy in practice to BCT or EFT, at least until other approaches are tested empirically, stating that "it only can be concluded from the state of today's research that the buyer should beware if a couple therapy moves far afield from either of the threads of strategies that have been demonstrated to work" (p. 15).

Having undergone rigorous empirical study, EFT and BCT have demonstrated significant efficacy for the treatment of couple distress. To date, the current evidence does not suggest one of these treatments is significantly better than the other (Gurman,

2011; Wood, Crane, Schaalje, & Law, 2005). In a meta-analytic study of trials examining either BCT or EFT compared to wait list control conditions, both treatment approaches were found to have large effect sizes for relationship distress (Bryne, Carr, Clark, 2004). However, this meta-analysis found that BCT was more effective for both short-term and long-term gains in couples who were experiencing moderate to severe couple distress while EFT seems to have had the most short-term and long-term gains when used with couples who were mildly to moderately distressed. Thus, EFT and BCT appear to have similar success in treating couple distress; however, it is important to note that no trials have been conducted comparing BCT and EFT directly. That said, BCT is widely considered to be the couple therapy approach with the strongest empirical support (Baucom, Shoham, Mueser, Daiuto, & Stickle, 1998; Chambless & Ollendick, 2001) with more than 40 scientific studies. Additionally, relevant to the current study, BCT is the intervention that has been most commonly adapted to treat individual problems in a couple therapy context. Thus, the remainder of this review will focus exclusively on BCT and its mechanisms of change. Theorized mechanisms will be discussed and empirical evidence will be highlighted whenever possible. Of note, as the mechanisms of action *of treatment* have been studied sparsely, this review of "mechanisms" in BCT will focus largely on evidence from observational studies examining partner interactions as predictive of positive and negative outcomes.

Mechanisms of Change in Behavioral Couple Therapy: Theory and Evidence

       Underlying theoretical framework for BCT. BCT is based on behavioral principles of reinforcement and social learning theory. Thus, relationship distress is hypothesized to develop due a lack of positive reinforcement. As leading BCT

researchers and clinicians, Jacobson and Christensen called this phenomenon

"reinforcement erosion," or a tendency for certain behavior to lose its reinforcing

properties due to repeated experience and reinforcement satiation (Christensen, Jacobson,

& Babcock, 1995). Basically, partners eventually habituate to the rewarding aspects of

the relationship. This is more commonly referred to as taking one's partner for granted.

Reinforcement erosion may be manifested in a variety of ways, but within the BCT

framework, communication is paramount. When communication is poor or ineffective,

paucities of positive reinforcement can develop. For example, partners in distressed

relationships are often guilty of "mind-reading," or assuming they know what the other is

thinking. Thus, one partner may not provide the other with reinforcement for a given

action because she assumes that he knows she is thankful or appreciative. Poor

communication also can lead to escalation of aversive stimulation within a relationship.

When couples are not communicating well, the needs of each partner may not be heard.

Thus, one partner may begin to increase demands, likely using more ineffective

communication strategies (e.g. nagging, goading, coercing), which leads to greater

aversive stimulation for the other partner. This cycle is then set to continually repeat itself

over time, with both partners receiving less and less positive reinforcement from the

relationship and greater punishment and aversive stimulation.

As discussed previously, the research on relationship distress supports the

conceptual underpinnings of BCT. Compared to nondistressed couples, distressed

couples are consistently observed to exhibit lower levels of positive interactions and

greater levels of negative interactions (Gottman & Notarius, 2000; Heyman, 2001). Thus,

based on the theoretical framework and supporting empirical evidence, BCT aims to

increase positive reinforcement within the relationship and promote effective positive communication. The findings from several studies and reviews support the hypothesized mechanisms of BCT.

Empirical support for the hypothesized mechanisms of BCT. Using data from one of the largest samples of treatment-seeking couples, Doss and colleagues (2005) found that self-reported behavior change related to BCT goals (e.g., targeted positive and negative partner behaviors) in treatment was associated with early treatment improvements in relationship satisfaction in a sample of 134 couples receiving either traditional or integrative BCT. Additionally, increases in couples' positive communication were significantly associated with increases in relationship satisfaction for both partners, and decreases in negative communication were related to increases in relationship satisfaction. Building on these findings, researchers examined the same sample of couples using behavioral data from an observational task assessed pretreatment and 26 weeks later. Similar to the findings from the self-report data, increases in negativity during discussions of marital problems were associated with decreases in relationship satisfaction; increases in problem-solving and positivity were associated with increases in relationship satisfaction (Sevier et al., 2005).

Summary of the status of BCT. In summary, BCT is theorized to act by teaching couples to engage in positive and effective communication thereby increasing positive reinforcement and reducing punishment and aversive stimulation in the relationship. Although these theoretical mechanisms have not been studied extensively, the research suggests that BCT leads to improvements in positive communication and behaviors as

well as reductions in negative behaviors, which in turn are associated with improvements in relationship satisfaction.

Evidence Supporting the Utility of Couple Therapy for Individual Problems

It has been established that BCT is effective in increasing relationship satisfaction; interventions utilizing BCT or BCT components to treat individual health problems also have shown promise. In the larger social support literature, "support interventions are based on the theory that increasing support allows people to better cope, and this enhanced coping will result in fewer psychological or physical symptoms" (Hogan et al., 2002, p. 426). Although the precise theoretical pathway described by Hogan and colleagues has not been directly tested, the evidence suggests that couple-based interventions for individual problems are effective and in many ways are advantageous over individual-focused treatments. A recent review examining studies comparing couple interventions for a range of medical disorders (cancer, heart disease, etc.) to treatment-as-usual or individual-focused psychosocial treatment found, for the majority of studies, that the couple intervention outperformed the control condition (Martire, Schulz, Helgeso, Small, & Saghafi, 2010). In addition to their qualitative review of the literature, Martire and colleagues found that compared to control conditions, couple treatment resulted in greater reduction of depressive symptoms, greater improvement in relationship satisfaction, and greater reductions in pain using meta-analytic methods. In a meta-analysis examining the efficacy of couple therapy for depression, Barbato & D'Avanzo (2008) found no difference between couple and individual treatment on depression outcome immediately posttreatment. However, as expected they saw significant improvements in relationship distress in couple treatment,

which could lead to greater improvements in depression outcomes over time, or at least greater maintenance of treatment gains. Baucom, Whisman, & Paprocki (2012) made this case, and went a bit further, stating that as relationship distress has been shown to be associated with increased risk of psychiatric disorders across mood, anxiety, and substance use categories, "then people in discordant relationships may be less likely to respond to individual-based treatments because the couple's relationship is not addressed or emphasized in treatment" (pps. 251-2). Research suggests that the presence of relationship distress is associated with poorer outcome in individuals who received individual-based treatment for a range of disorders (Baucom et al., 2012).

Although the effects and incremental efficacy of couple-focused interventions on the resolution of individual physical and mental health problems have not been studied as extensively as the impact of couple therapy on relationship distress, current evidence suggests that at the very least, couple therapy produces treatment outcomes similar to individual therapy while at the same time producing greater gains in relationship satisfaction. In many cases, the couple-focused treatments produce improved outcomes in both domains. From a more holistic perspective, these gains are likely to improve over time and result in even greater improvements as the relationship between individual partner health and relationship satisfaction is well-documented (Baucom et al., 2012). As the present study is focused on a couple intervention for alcohol problems, the next section of this paper will focus on the empirical support for Alcohol Behavioral Couple Therapy and examine the evidence for the proposed mechanisms behind the intervention.

Evidence for Behavioral Couple Therapy for Alcohol Problems

      ABCT effectiveness and theory. Alcohol Behavioral Couple Therapy has garnered significant empirical support regarding its effectiveness over more traditional, individual-focused treatment approaches. Recognized as an empirically-supported treatment (NREPP, 2006), a number of studies have shown ABCT to produce greater reductions in identified patient (IP) drinking when compared to individual treatment (McCrady, Epstein, Cook, Jensen, & Hildebrandt, 2009; O'Farrell, Cutter, Choquette, Floyd, & Bayog, 1992; O'Farrell, Murphy, Stephan, Fals-Stewart, & Murphy, 2004). Additionally, individuals who received ABCT reported greater percent days abstinent (PDA) during follow-up than individuals receiving treatments with less intensive involvement of the spouse (McCrady, Stout, Noel, Abrams, & Nelson, 1991). In a meta-analysis of BCT for alcohol and drug problems, an effect size of $d = 0.54$ was found favoring BCT over comparable individual-focused treatment (Powers, Vedel, & Emmelkamp, 2008).

      ABCT is based on three major theoretical perspectives: (a) cognitive-behavioral models that view drinking as a learned behavior, (b) interactional models that posit drinking occurs within a social framework, and (c) social exchange models that take into account the importance of reinforcement in relationships (McCrady in Longabaugh et al., 2005). ABCT posits that drinking occurs in an interactional context. Thus in intimate relationships in which an alcohol use disorder (AUD) is present, both partners may behave in ways that serve to reinforce drinking behavior, by either providing positive consequences for drinking (e.g. increased intimacy during intoxication) or protecting the drinker from negative consequences of drinking (e.g. non-drinker calling in sick to work

for his or her hungover spouse). Couples in which at least one partner has a drinking problem exhibit low rates of positive interactions (Halford, Bouma, Kelly, & Young, 1999). Thus, much like the perspective of BCT on general relationship distress, the theory behind ABCT is that increasing the overall rate of positive reinforcement in a couple will serve to reduce the reliance on alcohol and break established patterns of reinforcement for drinking.

The majority of the research on the ABCT approach has led to two approaches for incorporating the spouse of a problem drinker into treatment. McCrady and Epstein (2009) have developed a treatment approach for ABCT that involves alcohol-dependent clients and their intimate partners throughout the treatment process. O'Farrell and Fals-Stewart (2000) developed ABCT as an adjunct or a follow-up treatment to primary individual-focused treatment. The basic theoretical assumptions to both approaches are similar; the major difference is that O'Farrell and Fals-Stewart's model is designed to target partner coping and relationship function, Epstein and McCrady's model is designed to help individuals initiate abstinence and learn individual coping skills in addition to the goals of the O'Farrell and Fals-Stewart model (Longabaugh et al., 2005).

Regardless of the specific approach to ABCT, the relationship and support provided by the intimate partner are conceptualized as integral components of the maintenance of the AUD. As mentioned previously, in addition to individual factors on the part of the IP, spousal responses to IP drinking and the quality of couple interactions are hypothesized to exert significant influences on drinking behavior (McCrady, Hayaki, Epstein, & Hirsch, 2002). Thus, as ABCT is designed to address such aspects of the

marital relationship in treatment, it should result in changes in spouse behavior and relationship quality, in turn leading through causal associations to treatment outcome.

Empirical support for hypothesized ABCT mechanisms. In a study examining the effect of ABCT on couples in which the husband had recently completed a 28-day treatment program for alcohol abuse or dependence, O'Farrell and colleagues (1993) found that greater use of targeted marital behaviors was associated with better marital adjustment at a 12-month follow-up period. Use of marital behaviors also was related to PDA at all follow-up points (although 6-month outcomes showed a nonsignificant trend at $p < .10$), such that greater use of marital behaviors was correlated with greater PDA (O'Farrell, Choquette, Cutter, Brown, & McCourt, 1993). In a second report of this study, greater use of marital behaviors targeted by the ABCT intervention was positively associated with both marital adjustment and PDA at a longer three-year follow-up period (O'Farrell, Choquette, & Cutter, 1998). These studies suggest that greater compliance with ABCT targeted behaviors is associated with improvements both in marital satisfaction and drinking outcome; however, the mediation of improvements in marital satisfaction on positive drinking outcomes was not explored.

Using a prospective design, McCrady and associates (2002) tested the theoretical assumptions of ABCT by investigating if spouse coping strategies or marital satisfaction predicted posttreatment drinking in a sample of couples receiving ABCT in which the male met criteria for either alcohol abuse or dependence. Spouse coping was related to drinking intensity during treatment such that male partners of women who had used more active/external coping skills prior to treatment drank less intensely when drinking compared to partners of women who used less active/external coping skills (spouse

coping was only assessed at pretreatment). Posttreatment marital satisfaction significantly predicted drinking intensity six months posttreatment. More importantly, greater use of relationship-related skills was associated with less intense drinking during the follow-up (McCrady et al., 2002). In the same sample, greater marital happiness was associated with greater PDA at 18-month follow-up (McCrady, Epstein, & Kahler, 2004). Interestingly, in a time-lagged analysis, marital happiness in the previous three months did not predict PDA for the next 3-month follow-up period, raising questions about the causative relation of relationship satisfaction to drinking.

Summary of the status of ABCT. Although causal chains linking ABCT treatment to changes in spousal behavior and marital satisfaction to drinking outcomes have yet to be fully explored, the current evidence suggests that ABCT works through its hypothesized mechanisms (i.e. spousal responses to drinking and marital interactions). Studies consistently have found that ABCT results in increases in marital satisfaction (see O'Farrell & Fals-Stewart, 2000). Additionally, marital satisfaction has been linked to positive treatment outcome (McCrady et al., 2004). Finally, use of ABCT targeted relationship behaviors has been associated with treatment outcome (McCrady et al., 2002, O'Farrell et al., 1993, 1998). Less is known about changes in spousal coping as a result of ABCT, and thus, whether such changes are linked to treatment outcome. Additionally, to date no treatment studies have examined the effect of couple communication on treatment response and outcome.

In summary, the social support aspect of ABCT is hypothesized to operate by changing spousal responses to drinking while increasing non-drinking related positive interactions of the couple. This general concept of promoting positive reinforcement

within the relationship is the same as the central tenet of general BCT. Although the current state of the literature remains too limited to allow for definitive conclusions, both ABCT and BCT more broadly appear to operate through their theorized mechanisms of action, namely increasing positive interactions between partners. BCT aims to increase global positivity, both through improved communication and higher rates of enjoyable shared experiences; ABCT is designed to foster similar increases in positive interactions, with a particular emphasis of alcohol-related situations and reinforcement of sobriety.

Status and Limitations of Current Literature on Couple Therapy

The literature summarized to this point leads to a number of conclusions. First, community samples of couples can be reliably classified into meaningful typologies based on a multitude of presenting characteristics pertaining to couple communication, affect, beliefs, and other relationship areas. Couple typologies offer a concise method for summarizing a range of information in a theoretically and clinically useful way. Second, BCT is effective in alleviating relationship distress and treating individual health problems. Third, ABCT, a modified version of BCT to treat alcohol problems, is more effective than individual treatments in alleviating alcohol problems and appears to work via theorized mechanisms drawn from the BCT theoretical framework. However, there are a number of gaps in the current literature.

First, the vast majority of data has come from assessment of couples in laboratory settings. In particular, behavioral observation of couples generally occurs during an experimental task, not during therapy. Although interactions in therapy may not necessarily be any more ecologically valid than interactions during a taped task, they may have different clinical implications as interactions are immediately observable by a

therapist (and thus, can be intervened upon in real-time). Second, the robustness of distinct couple typologies has not been tested in samples of couples where one partner has an individual mental health problem. Thus, there are no data on whether couples presenting for treatment for a range of mental disorders, including AUDs, look like community samples of couples. This makes it difficult to apply such evidence to samples of couples with high rates of co-morbid individual psychopathology. Third, in couples where one partner meets criteria for an AUD, evidence suggests that such couples differ from non-alcoholic couples on topographical characteristics. For example, alcoholic couples are likely to exhibit more negative behaviors than non-alcoholic couples (Jacob & Krahn, 1988). However, such differences may be attributable to distressed couples in general, not specifically to alcoholic couples (although some evidence exists that depressed couples differ from alcoholic couples). Typologies of alcoholic couples are non-existent, yet such information could shed light on the presentation of such couples and how their presentation may be unique and/or similar to distressed couples more generally.

Conclusions and Study Aims

The adverse consequences of relationship distress are well documented, and include not only the partners of the couple but also the larger social network and community. A large body of empirical research suggests that couple therapy is effective for many people, both in alleviating relationship distress and improving individual health problems. Relevant to the current study, ABCT is effective at reducing relationship distress and resolving alcohol use problems. Additionally, ABCT outperforms individual treatment for alcohol problems. Although the data are more limited, ABCT appears to

work through theorized mechanisms based on general BCT principles. The current study aims to expand knowledge on the mechanisms of ABCT and address some of the limitations in the couple therapy literature. Namely, classification of couples based on their presentation across a variety of couple characteristics (e.g., interaction patterns, communication style, problem-solving skills) has considerable potential clinical utility in terms of treatment outcomes. However, there is currently no literature on whether couple typology at the start of treatment predicts treatment response.

Aim 1. The primary aim of the current study was to examine whether couples presenting for treatment when one partner meets criteria for an AUD have a similar topography to couples without alcohol concerns. The long term goal of this research is to identify clinically useful categories of couples entering treatment for alcohol problems that could guide targeted clinical interventions and/or expectations in terms of treatment response. Specifically, it was hypothesized that four couple typologies would emerge from examination of couple behavior during the first treatment session, mirroring previous findings from the general couples literature (i.e. Gottman, 1993). The typology described by Gottman was selected as the primary comparison model because: (a) Gottman used observational data similar to the data utilized in the current study, (b) Gottman's couple types are conceptually similar to a number of other couple typology studies, and (c) Gottman's couple typology is the only one that has been replicated by multiple researchers. These types were: validator, volatile, avoider, and hostile couples. It was predicted that validator couples would be characterized by high levels of positive behavior, low-to-moderate levels of negative behavior, and high levels of relationship satisfaction. Volatile couples were expected to be characterized by high levels of positive

behavior, moderate-to-high levels of negative behavior, and moderate-to-high levels of relationship satisfaction. It was predicted that avoider couple would be characterized by moderate-to-low levels of positive behavior, low levels negative behaviors, and moderate levels of relationship satisfaction. Hostile couples were expected to be characterized by low levels of positive behavior, high levels of negative behavior, and low levels of relationship satisfaction. Of note, Gottman's typology was developed using a community sample of couples and the current study was comprised of couples seeking ABCT treatment. Thus, one might have expected the present sample to be skewed towards the distressed range. However, preliminary examination of baseline marital quality, as assessed using the Areas of Change Questionnaire (Margolin, Talovic, & Weinstein, 1983), showed that the current sample had a wide range of relationship quality and the distribution approximated normality. Thus, initial examination of the data did not suggest the current sample was restricted in terms of presenting relationship quality.

Aim 2. A second aim of the current study was to extend the literature on the mechanisms of change in ABCT by examining the predictive power of in-session behavior on treatment outcome. It was hypothesized that couple typology would predict changes in alcohol use within-treatment and posttreatment. The third study aim was to examine the potential moderating effects of baseline marital distress and baseline alcohol use. Another variable of interest identified in the literature is IP gender; studies of interactions of alcoholic couples to date have only involved couples in which the male partner has the alcohol problem. The current study examined whether gender of the IP impacted treatment response by including the moderation effect of gender.

Method

Participants

The study sample consisted of 169 heterosexual couples enrolled in one of four randomized controlled trials examining the efficacy of ABCT for whom in-session behavioral data from the first treatment session were available. Across studies, inclusion criteria were: (a) IP currently in a committed relationship, (b) SO willing to participate in treatment, and (c) IP met current drinking problem criteria as defined by the study. Exclusion criteria were: (a) IP or SO dependent on drugs other than alcohol, (b) evidence of psychosis, or (c) evidence of significant cognitive impairment. Additional information on the inclusion/exclusion criteria by original study is provided in Table 2. Of the IPs, 72 (42.6%) were male with a mean (SD) age of 44.6 (10.2) years. IPs had 14.3 (2.8) mean (SD) years of education and reported a mean (SD) length of drinking problem of 14.0 (10.2) years. SO mean (SD) age was 45.0 (11.3) years with a mean (SD) of 14.6 (2.4) years of education. The sample was predominantly White (91.1% of IPs and 79.3% of SOs); 4.1% of IPs and 3.6% of SOs were African American, 1.8% of IPs and 3.0% of SOs were American Indian/Alaskan Native and less than one percent of both IPs and SOs identified as Hispanic/Latino or Asian American. Most (85.8%) couples were married, 8.3% were not married but living together, 3.6% were committed but not living together, and 1.2% were separated. Table 3 provides additional information on pre- and posttreatment alcohol use in the sample. Follow-up rates for 3-, 6-, 9-, and 12-months after the first treatment session were 95.3%, 56.8%, 84.0%, and 82.2%, respectively. As the anchor points for follow-up varied across studies, all data were recoded so that all follow-ups were anchored to the date of first treatment session. Thus, the 3- and 6-month

follow-up points capture within-treatment outcomes; the 9- and 12-month follow-up points reflect posttreatment outcomes (except in a few cases, see note below Table 3).

Description of Studies

As mentioned previously, the data for the current study were collected and standardized across four unique randomized controlled trials. These studies are: (a) Program for Alcoholic Couples Treatment (PACT), (b) Men's Relapse Prevention Study (MEN), (c) Women's Treatment Project I (WTP1), and (d) Women's Treatment Project II (WTP2). All studies were reviewed and approved by the appropriate IRB at the institution where the research was conducted. PACT was designed to examine various components of spouse involvement in alcohol treatment for couples in which one partner had an alcohol problem. The study included three treatment conditions: minimal spouse involvement, alcohol-focused spouse involvement, and ABCT. Results suggested better alcohol use and relationship satisfaction outcomes in the ABCT condition relative to the other two conditions (McCrady et al., 1986, 1991). For the current study, only participants in the ABCT condition were included. The MEN study tested two additions to ABCT designed to reduce posttreatment relapse in men with alcohol problems. The study included three conditions: ABCT, ABCT enhanced with Relapse Prevention interventions, and ABCT enhanced with interventions to increase IP involvement in Alcoholics' Anonymous. Findings from this study suggested similar outcomes across treatment conditions (McCrady et al., 1999, 2004). Participants in all three treatment conditions were included in the present study. WTP1 compared individual cognitive-behavioral therapy (CBT) for alcohol problems to ABCT in women with alcohol problems. Results suggested that ABCT was associated with greater improvements in

alcohol outcomes (McCrady et al., 2009). Only participants receiving ABCT were included in the current study. Finally, WTP2 was designed to build on WTP1 and further investigate effects of alcohol treatment in women. Women first got to choose individual or couple therapy; those indicating a preference for couple therapy were randomized to one of two treatment conditions: ABCT or a blend of individual CBT and ABCT. Results of this study are not yet available. Participants in both the ABCT and blended ABCT conditions were included in the present study.

For each study, participants were recruited from the community in one of two northeastern states through advertisements and referrals from local alcohol treatment programs. In all studies, an initial screening was conducted over the phone followed by a more comprehensive in-person intake during which eligibility was determined. Both partners were required to attend the in-person interview. After eligibility was determined, informed consent was obtained, baseline data were collected, and couples then were randomized to treatment condition. Across studies, all treatments were manual-guided. Table 4 provides additional information on the treatment conditions for each study. Therapists in all studies were master's level clinicians, doctoral level clinicians, or advanced graduate students; preliminary analyses suggested no differences in outcomes between therapists by study. All treatments used similar techniques and the core treatment was consistent across the four studies. This included several individual CBT elements (functional analysis, stimulus control/self-management, coping with alcohol-related thoughts and urges, learning alternatives to drinking), several adapted CBT elements directed toward the partner (partner functional analysis, rearranging consequences of drinking, decreasing protection for drinking, role in drink refusal

situations), and several BCT techniques (reciprocity enhancement, shared activities, communication skills). The structure for the first session was largely the same for all four studies, consisting of: introduction to and orientation to ABCT framework, rationale for couple treatment for alcohol problems, and description of treatment requirements that included teaching couple to complete self-monitoring cards. Feedback from the baseline assessment also was provided to couples; this ranged from informal to formal feedback across studies. For all treatment conditions included in the present study, SOs were present during the first session. In fact, SOs attended all treatment sessions in all treatment conditions except for the Blended condition in the WTP2 study; in that condition SOs attended the first session and then attended sessions 7-12.

Measures

    Baseline measures. Basic demographic information was collected at baseline and standardized across all studies. Data for both IPs and SOs included: age, gender, race/ethnicity, education, and relationship status.

    Baseline relationship satisfaction was assessed via the Areas of Change Questionnaire (ACQ: Margolin, Talovic, & Weinstein, 1983). The ACQ measures each partner's desired change in the relationship across 34 areas of couple functioning. The ACQ has good reported reliability, as well as discriminative and predictive validity (reviewed in Fals-Stewart, Schafer, & Birchler, 1993). Scores can range from zero to 102, with a higher score indicating less marital satisfaction. In the current study, IP scores were used as SO scores were not available for all studies.

    Baseline IP alcohol use was assessed using the 90-Day Timeline Followback (TLFB: Sobell et al., 1979), an assessment technique that obtains estimates of daily

drinking over a specified period of time. For the current study, data were anchored to the 90 days prior to the IP's most recent drinking day before the baseline assessment. Using information gathered from the TLFB, percent days abstinent (PDA) was calculated. The TLFB has been shown to have high inter-rater reliability and excellent validity in multiple populations, clinical and nonclinical (Green et al., 2008).

In-session behavior was measured using a modified version of the Motivational Interviewing with Significant Others (MISO) Coding Manual (Apodaca, Manuel, Moyers, & Amrhein, 2007). This coding system was designed to capture in-session verbal behavior of both the IP and the SO at the global and individual unit of speech levels. During their first pass, coders used both an audio recording and transcript of the session to rate seven overall dimensions of in-session behavior. These global codes are provided in Table 5. For each global code, coders rated IP and SO communication over the entire session on a scale from 1 to 5. All ratings were coded such that higher scores indicate positive interactions (e.g. higher scores on Support-General indicate greater support and encouragement) except for the Contempt code (i.e. lower scores on Contempt indicate greater warmth and appreciation; higher scores indicate greater disdain or contempt). Coders then listened to the session a second time and coded IP and SO utterances on 11 overlapping, but not identical, specific behavior codes for each partner (listed in Table 5). All transcripts were pre-parsed by a different research assistant to define codeable behavior units.

Through an intensive iterative process involving, among others, an expert in ABCT and one of the developers of the original MISO system, the adapted version of the MISO for ABCT was created to capture theoretically important behavior. Preliminary

reliability analyses using non-study tapes of ABCT found the modified MISO manual could be used reliably across coders. Using a conceptually-driven deductive approach, the MISO behavior count data were collapsed into three variables for the IP and the SO (for six variables total) describing positive, negative, and neutral verbal behavior. The assignment of behavior codes into superordinate categories was based on empirical and theorized support for the function of such behavior within the relationship. As the goal of this study was to examine whether previously established couple types can be replicated in couples with alcohol problems and there is limited information on the influence of alcohol-specific versus general behavior, no distinctions between specific utterances in terms of topic were made. Thus, although positive, negative, and neutral behavior categories were created based on the information available, these categories were not assumed to be unidimensional, nor was it assumed that individual items would hang together statistically. For example, in some couples the SOs could belittle their IPs about his/her drinking in the service of encouraging their IPs to engage in treatment while in other couples SOs could berate their IPs generally and express disinterest in participating in treatment. Thus, the rates at which SOs verbalize Confronts would not necessarily be associated with rates of Counter Change Talk utterances. However, the function of these two behaviors in the current coding categorization system is still believed to negatively impact the relationship based on previous research on interactions of couples and studies on alcohol. In order to investigate whether the categories did or did not hang together statistically, Cronbach alphas were examined for the collapsed code categories. As expected, the alphas were rather low ($\alpha = .04$ for IP positive behavior, $\alpha = .24$ for SO positive behavior, $\alpha = .25$ for IP negative behavior, $\alpha = .11$ for SO negative behavior, and

*α*s could not be calculated for IP or SO neutral behavior due to a negative average

covariance among items). The alphas for any given category did not significantly

improve when any single item in that category was removed. Ultimately, the creation of

these codes was based on theoretical assumptions about the function of specific behaviors

within a relationship drawn from the general couples and alcohol literatures. Table 5

provides the grouping of the behavior codes. Additionally, because the number of codes

in a given session varied significantly, the relative frequency of each code was used

rather than the raw count. Relative frequencies were calculated separately for the IP and

SO (i.e. the sum of the 3 codes for each partner equaled 1).

As the goal of the current study was to examine *couple* behavior, IP and SO codes

were combined. This served to provide information at the couple level rather than at the

individual partner level. The following formula from Lavee & Olson (1993) was used to

aggregate partners' codes into a couple code:

$$C = \frac{(IP + SO)}{2} + \frac{k*|IP - SO|}{2}$$

where C = couple score. This formula was selected as it captures both location of the

couple on a given scale (the first part of the formula which provides the mean score of the

two partners) and discrepancy between partners (the second part of the formula which

provides information on the discrepancy between IP and SO scores). Lavee & Olson

recommend including a constant (*k*) ranging from 0 to 1 for weighting the discrepancy of

the couple. For the current study, *k* was set to 0.5, serving to weight the discrepancy

between couples such that discrepancy had half the impact on the final couple score as

scale location. This weighting was chosen as it represents the midrange value of *k* and

replicates the weighting chosen by Lavee & Olson (1993); it is important to note the most appropriate value for *k* has yet to be empirical tested.

This data reduction was done for several reasons. One, categorization of behavior along positive and negative dimensions mirrors previous studies examining couple language (e.g., Gottman 1993), and thus enhances the generalizability of the current study to the larger couples literature. Two, as it was expected that some of the specific MISO behavior codes would occur at low frequencies, grouping conceptually similar codes serves to increase the variability of the codes included in the current analysis and likely increase the reliability of the coding system. Three, too many behavior codes render the clustering analysis discussed below unwieldy, both computationally and descriptively. And four, as mentioned previously, calculating a single couple score moves the level of measurement from the individual to the couple (Lavee & Olson, 1993). As the current study is interested in describing *couples*, the couple level of measurement was determined to be preferable. Ultimately, seven clustering variables reflecting couple behavior were drawn from specific behavior codes (positive, negative, and neutral) and global codes (general support, alcohol-specific support, collaboration, and contempt). Of note, as data for alcohol-specific support only exist for the SO, this code reflects the SO's support for sobriety and treatment rather than a couple score.

Follow-up measures. Alcohol use during and after treatment was assessed using two methods: daily self-monitoring logs and the TLFB. Within treatment alcohol use was assessed with daily self-monitoring cards. For each day, IPs were instructed to record their drinking and amount (if any) on these cards. Partners also completed similar monitoring cards recording the drinking of the IP. Of note, within-treatment variables

were computed using an iterative process based on what data were available. First, weekly PDA was computed based on IP self-monitoring cards, but if IP cards were absent then SO data were used if available. In the event that no self-monitoring data existed, TLFB data were used for the Women's studies (the TLFB was not administered for within-treatment in PACT or MEN). The weekly PDA value was computed when data for at least 70% of days were available for that week; if less than 70% of the data were present for that week it was coded as missing. All posttreatment outcomes were assessed via the TLFB.

Analytic Plan

The analyses for this study mirrored the sequential structure of the study aims. Thus, a multistep analytic strategy was planned. First, the raw data were preprocessed as discussed previously and examined for violations of normality. Transformations were made as necessary or as planned (discussed in more detail below).

To test aim 1, whether couples seeking ABCT can be grouped based on their clinical presentation into groups similar to those found in community couples, a cluster analysis was conducted. Cluster analysis refers to a group of analytic techniques designed to find homogenous groups within a dataset. At the most basic level, cluster analytic strategies can be used to reduce a complex multivariate dataset to its central features. However, how a researcher arrives at a final solution depends on a number of decisions along the way. Thus, researchers must be clear about their decision-making process at each step of the analysis. Lorr (1983) described these steps as: (a) identifying cases for analysis, (b) selecting, reducing and scaling clustering variables, (c) choosing a (dis)similarity measure to differentiate cases, (d) choosing one's clustering algorithm, (e)

determining number of clusters, (f) interpreting cluster profiles, (g) determining cluster stability, and (h) determining cluster validity. As multiple researchers have pointed out, there is rarely one correct method; rather the choices made in conducting a cluster analysis depend on the study research question and researcher judgment (Borgen & Barnett, 1987; Garson, 2012; Rapkin & Luke, 1993). The analysis plan for the current study will now be described, addressing each of the steps identified by Lorr (1983).

The cases identified for analysis have already been described as the 169 couples seeking ABCT for whom data from their first treatment session are available. Additionally, selection of clustering variables has been covered; seven couple variables were entered into the cluster analysis comprising the four global codes and the relative frequency for the three collapsed behavior codes from the MISO. These were selected based on the theoretical reasons highlighted previously and on empirical grounds. Beyond including variables that are similar to those used in previous research and that will allow meaningful interpretation, the number of variables selected was intentional. According to Mooi & Sarstedt (2011), although there are no universal standards for establishing the necessary sample size based on the number of variables entered into a cluster analysis, a general rule of thumb put forth by Formann (1984) is the recommendation of a sample size of at least 2^m, where m equals the number of clustering variables. The current study met this recommendation ($n = 169$, $2^7 = 128$). Also, a high degree of collinearity between clustering variables ($r > 0.9$) will lead to similar characteristics being overrepresented in the final solution (Mooi & Sarstedt, 2011). The selected variables did not violate this condition; the highest correlation was between couple collaboration and couple contempt at $r = 0.8$, the next highest was less than 0.7.

Finally, because variables with larger values can differentially impact distance, all variables entered into the cluster analysis were similarly scaled via standardization into z-scores. Additionally, variables were Winsorized (i.e. values greater than ±3 will be set at 3) as cluster analysis strategies can be susceptible to outliers. Examination of the data indicated that less than 3 percent of cases for any given variable were changed due to Winsorization (with an average of less than two cases being altered per variable).

Squared Euclidean distance was used to derive a proximity (i.e. distance) measure among cases/clusters. Euclidean distance is the most common approach to determining similarity of cases (Rapkin & Luke, 1993) and represents the sum of the squared differences between all variables between two cases. Mathematically, the formula for Euclidean distance of two cases (Couple$_1$ and Couple$_2$) is:

$$\text{Euclidean distance } (C_1, C_2) = \sqrt{(x_1-x_2)^2 + (y_1-y_2)^2}$$

where *x* and *y* represent two clustering variables. Ward's (1963) method was selected as the clustering algorithm. Used widely in the behavioral sciences, Ward's method is designed to minimize the variance across all clustering variables within clusters at each grouping stage. Thus, this method was selected as it serves to minimize within group differences and maximize between group differences.

To determine the number of clusters, couple typologies were established using a two-phase cluster analysis strategy. First, a hierarchical cluster analysis was conducted to examine possible cluster solutions of the data. Then a K-means cluster analysis was used to determine group membership of individual couples based on the number of clusters established *a priori* during the hierarchical analysis. This analytic plan was chosen for multiple reasons: (a) utilization of hierarchical and k-means techniques (as opposed to

either one alone) enhance the likelihood of establishing meaningful couple classifications that reliably reflect the underlying data structure (Borgen & Barnett, 1987; Garson, 2012; Mooi & Sarstedt, 2011), and (b) this strategy is similar to that used in previous research on couple typologies using cluster analysis (e.g., Fisher & Ransom, 1995; Fowers & Olson, 1992; Lavee & Olson, 1993), and thus, enhanced the function of this study as replication of previous research.

As mentioned, after the clustering variables were standardized and Winsorized, the hierarchical agglomerative cluster analysis was conducted. Using this strategy, each case represents its own cluster initially. Higher order clusters then are formed by sequentially merging cases that are most similar (i.e. those with the smallest distance between them calculated via Ward's (1963) method). This bottom-up process continues until all cases are grouped into a single cluster. Advantages of starting with a hierarchical cluster analysis is that this technique work well in smaller sample sizes (< 250) and one can inspect the results with different numbers of clusters (Garson, 2012). Although the current couples literature suggests couples can be reliably classified into a small number of subtypes, the exact number of types is seen to vary across samples and studies. Thus, this analytic technique allowed for inspection and comparison of solutions with varying numbers of clusters. Based on previous literature, solutions of 3-6 clusters were considered. To evaluate the quality of fit of the various cluster solutions for the data, a number of recommended criteria were examined, including: (a) number of cases within a cluster, (b) examination of the hierarchical dendrogram, and (c) tests of multivariate effects (Funk, Ives & Dennis, 2006; Rapkin & Luke, 1993).

Once the number of clusters was established, a K-means cluster analysis framework was utilized to test the stability of the cluster solution and establish the group membership of each individual couple. Unlike hierarchical techniques, in a K-means cluster analysis number of clusters is established *a priori* and cases are assigned to clusters based on an iterative process of modifying k randomly generated cluster centers until the change in centers is minimal. In other words, this is a top-down clustering process and served as an additional strategy for validating the solution with k clusters found in the hierarchical analysis (Garson, 2012).

Once an acceptable cluster structure had been determined and cluster membership of each couple was established, the means of the seven clustering variables were examined within each cluster to allow for interpretation of the cluster solution and establish descriptive properties of each cluster. This profile interpretation then was compared to those from previous couple research, namely Gottman (1993) to test whether the characteristics of the empirically-derived couple typologies matched the predicted characteristics of validator, volatile, avoider, and hostile couples. This was done by entering the seven MISO clustering variables into a one-way ANOVA framework with cluster membership as the independent variable. Additionally, baseline relationship satisfaction and PDA were entered into this framework as a test of concurrent validity of couple clusters. For all variables, simple contrast tests were conducted to examine when one cluster varied significantly from the other clusters.

At this point in the analyses, all couples had been assigned to membership in a single typology. Aim 2 served as an additional validation test of the cluster solution by testing whether couple typology predicted alcohol outcome during and after treatment.

Aim 2 was addressed by entering typology as a level-2 predictor variable within a multilevel modeling framework. Longitudinal data from the four follow-up assessments of alcohol use (3-, 6-, 9-, and 12-months) were structured such that time points were nested within individuals. There are a number of advantages of using a multilevel framework to model the data from this study (as opposed to a repeated measures MANOVA or traditional multiple regression analysis). The following advantages were articulated by Bryk and Raudenbush (1992) and Hox (2002). First, such models provide growth curves at the individual level rather than the group level, which better fits general conceptualizations of change over time. Second, multilevel models make it simple to add higher levels to investigate the effect of groups or clusters on individual change. Third, this type of analysis allows a straightforward method to model change in individuals and average change in groups. Fourth, multilevel models offer greater flexibility in terms of missing data. Traditional methods (e.g., MANOVA) remove cases listwise in the event of any missing data points. Multilevel models do not assume the same number of observations per individual, and thus all cases with at least one data point can be retained in the analysis. Finally, the missing data do not need to be imputed, removing issues of bias around the (non)randomness of missing data.

As mentioned previously, typology was entered as the primary level-2 predictor variable of interest within a multilevel modeling framework to determine if clusters of couples differed in terms of alcohol use during the follow-up period. Baseline IP alcohol use and relationship satisfaction were entered as level-1 predictor variables to control for the effects of these baseline variables. Additionally, as outcome varied significantly by original study (Table 3), original study was entered as a covariate (i.e. level-2 variable).

Using this framework, the effect of couple typology on alcohol use outcome across the four follow-up time points (the first follow-up providing a measure of within-treatment change) was examined. As the main effect of typology only provides the overall effect of group membership across all time points, time also was entered into the framework and the interaction between couple type and time was examined to determine whether response to treatment over time varied by couple type. Finally, to test for potential moderating effects, variables of interest (e.g., gender of IP) then were entered as additional level-2 predictor variables. The fixed effects for the intercept were included in all models; this effect simply establishes whether the dependent variable, which is always follow-up PDA in the current analyses, significantly differs from zero. Categorical level-2 variables of interest (i.e. couple type, original study, gender) were assigned consecutive integer values (i.e. 1, 2, etc.). As these values were not "real" values (i.e. did not represent actual scores), these variables were not centered at zero.

Results

Reliability of MISO Codes

Seven trained raters coded study sessions based on the MISO Coding System. Approximately 10 percent of sessions ($n = 19$) were double-coded by all coders. Reliability was assessed using two-way, single-measures absolute-agreement intraclass correlation coefficients (ICCs; Hallgren, 2012; Shrout & Fleiss, 1979). This measure was selected as a more conservative estimate of reliability that allows for greater generalizability across raters. ICCs for the global, collapsed behavior, and original behavior MISO codes are provided in Table 6. According to guidelines suggested by Cicchetti (1994) for establishing clinical significance, the majority of ICCs fell in the fair

to good range (12 out of 13 estimates for the variables used the current analyses). The remaining ICC (for Alcohol-Specific Support) fell in the poor range. Thus, overall the coding of observed behavior was adequately reliable except for Alcohol-Specific Support (SO Negative Utterances was right at the cutoff point of fair-to-poor). Conclusions based on the Alcohol-Specific Support code should be made cautiously, as the poor reliability suggests that this code may not be coded consistently across different raters. Of the 22 reliability estimates for the original MISO behavior codes, all but two fell in the fair or better range. Out of these 20 codes, the reliability for five fell in the excellent range and nine fell in the good range.

Raw MISO Data

Table 7 provides descriptive information on the raw MISO codes and for the clustering variables. On average, there were 325 (SD = 149) IP behavior codes and 185 (SD = 91) SO behavior codes during the first treatment session. The majority of behavior codes were neutral utterances, with a mean (SD) frequency of 86.5% (7.0%) of IP behavior and 91% (6.1%) of SO behavior coded as such. IPs expressed positive behavior 8.6 % (4.9%) of the time, SOs 6.3% (4.6%) of the time. The rest of time, IPs and SOs expressed negative behavior, 4.9% (4.7%) and 3.1% (4.0%) respectively. Generally, SOs were supportive of IP abstinence and/or engagement in treatment as indicated by a mean (SD) rating of 4.0 (0.7) on the global Alcohol-Specific Support code. SO General Support was more moderate, although leaning towards SOs being more supportive than not with a mean (SD) rating of 3.5 (0.8). IP General Support was similar, although more tempered than that of the SOs with a mean (SD) of 3.2 (0.8). SOs and IPs were more collaborative than not as well, with mean (SD) ratings of 3.7 (0.9) and 3.5 (0.9) for Collaboration

respectively. Although not terribly explicit in their warmth, both SOs and IPs tended to score below the midpoint on the Contempt scale, 2.4 (1.1) and 2.5 (1.1) respectively, indicating that partners expressed slightly more warmth than contempt in session.

Hierarchical Cluster Analysis

Based on comparisons of 3- to 6-cluster solutions, the smallest cluster size dropped significantly from the 3- to 4-cluster solution, and then remained relatively stable (Table 8). Additionally, examination of the estimate of variance of the multivariate distribution (as measured by 1-Wilks' Lambda; Funk et al., 2006) revealed a jump from the 3- to 4-cluster solutions with a modest increase for each subsequent solution. A similar pattern was observed for Roy's Largest Root, which indicates whether one cluster group is very different from the others (Funk et al., 2006). Finally, the dendrogram provided a pictorial depiction of the agglomerative clustering of cases by the relative size of proximity coefficients at which clusters were combined, thus clusters with low distance (i.e. high similarity) are close together as indicated by shorter lines. Examination of the dendrogram suggested that a 4- or 6-cluster solution best described the data (Figure 1). Integrating these findings, a 4-cluster solution was selected as appropriate and adequate for the current sample.

K-means Cluster Analysis

K-means cluster analysis indicated a viable 4-cluster solution. Convergence was achieved within seven iterations. Cluster centers for the seven clustering variables from the MISO codes are provided in Table 9. Relative to the full sample, couples in cluster 1 ($n = 75$) were characterized by a moderate absence of valenced behavior (i.e. below

average levels of positive and negative utterances). They were slightly higher in General

Support, but exhibited slightly lower Alcohol-Specific Support. These couples displayed

moderately elevated levels of Collaboration and moderately lower levels of Contempt

(i.e. they were warmer towards one another). These couples most closely resemble

Gottman's (1993) avoider couples. Couples in cluster 2 ($n = 34$) exhibited high levels of

positive utterances and moderately low levels of negative utterances. They were observed

to display high levels of both General and Alcohol-Specific Support, as well as high

levels of Collaboration and low levels of Contempt. These couples resemble the validator

couples described by Gottman. Couples in cluster 3 ($n = 10$) were characterized by

slightly elevated levels of positive utterances and extremely high levels of negative

utterances. They displayed rather low levels of General Support, but slightly elevated

Alcohol-Specific Support. They engaged in little Collaboration and displayed high levels

of Contempt. These couples most closely present like Gottman's hostile couples. Finally,

the couples in cluster 4 ($n = 50$) displayed slightly elevated levels of both positive and

negative behaviors. They showed low levels of General and Alcohol-Specific Support, as

well as moderately low levels of Collaboration and moderately high levels of Contempt.

Although sharing some similarities to Gottman's volatile couples in demonstrating

elevated levels of both positive and negative behaviors, this group of couples also

departed from the description of Gottman's volatile couples by showing less warmth and

collaboration. Overall, the results of the current study largely replicate Gottman's

previous findings, both in terms of the number of couple types and the description of

those couple types.

Concurrent Validity of Couple Types

The concurrent validity of the 4-cluster model was tested by examining if the mean scores for couples in each cluster differed significantly from one another on the seven clustering variables as well as on baseline ACQ score and PDA. The results presented in Table 10 show that the clusters differed significantly on all variables of interest, except for PDA. Based on the clustering techniques chosen (i.e. Ward's method), it was expected that the clusters would differ significantly on the original clustering variables as was observed. However, the ACQ, as a measure of relationship satisfaction, was not included in the clustering analysis. This variable also differed significantly by cluster. Pairwise contrast tests indicated that couples in clusters 1 and 2 had significantly greater relationship satisfaction than couples in clusters 3 or 4. Clusters of couples did not differ significantly on baseline PDA.

Testing the Effect of Couple Type on Alcohol Outcome

Effect of couple type. To test whether couple type predicted treatment response, the main effect of couple type was examined across the entire follow-up period, controlling for baseline relationship satisfaction, PDA, and original study. All PDA variables were arcsine transformed to address nonnormal distributions. Table 11 provides the results of the basic multilevel model testing the main effect of couple type on PDA during the follow-up time period. Although baseline PDA and original study were significant predictors of PDA during the follow-up, couple type was nonsignificant. Thus, couple type was not a significant predictor of overall treatment response in terms of alcohol use outcome.

Effect of time. The next step was to examine the effect of time and the possible interaction with couple type. In other words, even though couple type was not significantly associated with alcohol use outcome during the follow-up, it is possible that couple type was associated with the change trajectory over the four follow-up time points. First, the main effect of time was examined. Due to the nonlinear trajectory of PDA over time (see Figure 2), time was modeled as a quadratic function rather than a linear function. As the first time point of the dependent variable was 3-month follow-up, not baseline, time was not centered at zero. In line with the quadratic representation of the variable, time was labeled so that the 3-month follow-up time point had a value of 1, 6-month a value of 4, etc. Examination of the data indicated that data were available for all 169 participants at a minimum of one follow-up time point. Data at multiple time points were available for 92% ($n = 155$) of the sample, and data from more than two follow-up time points were available for 86% ($n = 146$) of the sample. Due to the nature of the current analysis, participants with data from only one follow-up time point would not influence the results as a time trajectory cannot be calculated for those participants; thus the decision was made to include all participants in the analysis. Of note, the model was run excluding participants with data for less than two follow-up assessments; the results were essentially unchanged from the analyses including all participants. Although not reaching a significance level of $p < .05$, time was observed to have a nonsignificant trend on PDA after controlling for baseline PDA, original study, and baseline ACQ score ($\beta = -0.005$, $SE = 0.003$, $p < .1$). Next, the effect of couple type was added to the model. Again, the effect of time exhibited a nonsignificant trend ($\beta = -0.005$, $SE = 0.003$, $p < .1$), and in fact remained unchanged with the addition of the effect of cluster type to the

model. However, the effect of couple type failed to reach significance. Despite a lack of main effect of couple type, the interaction term for time X couple type was then added to the model (Table 12). This was still examined as there may be subtractive effects of the clusters that emerge in a moderation analyses even without a significant main effect. When the interaction term was included in the model, none of the effects of time, couple type, or the time X couple type interaction were significant. Of note, a comparison of the models was conducted using the -2 Log Likelihood criteria as fit indices. The comparison was significant, χ^2 ($df = 1$) = 9.88, $p < .05$ with the simpler model having a smaller -2 Log Likelihood, indicating that the model without the interaction term (and thus, the model with a nonsignificant trend for the effect of time) was a more appropriate model for the current data.

Effect of gender. Finally, the moderation effect of gender was examined despite the lack of a main effect of couple type (Table 13). The results were similar to the previous model with the effect of time, with the effects of couple type, gender, and the couple type X gender interaction were all nonsignificant.

Post hoc analyses. As original study was seen to be a significant predictor of PDA, post hoc analyses were conducted to further examine the effect of original study and whether any studies in particular were outliers that may have been exerting undue influence in suppressing any potential effects of cluster and/or time. One-way ANOVAs examining the effect of original study on PDA showed that PDA varied significantly by study at all follow-up time points except at six months (a Bonferroni correction was applied so that $p < .01$). Further examination showed that the WTP2 study was largely driving this effect, as simple contrasts found that PDA for participants in the WTP2 study

was significantly lower than PDA in other studies at the 3-, 9-, and 12-month follow-up points. PDA at the 3-month time point was observed to be significantly higher for participants in the PACT study; this effect was not observed at any later time point. As a potential outlier, the multilevel models described previously were rerun omitting participants from WTP2. The results were similar - no changes were observed in the (non)significance of any given effect. Thus, although alcohol use outcome varied by original study, there was no evidence that the poorer outcomes observed in WTP2 suppressed any possible effects of couple type.

Discussion

The current study was the first study to examine the clinical presentation of treatment-seeking couples in which one partner had a problem with alcohol with the aim of classifying couples into distinct and meaningful types based on observed behavior during an initial treatment session. The goal of the current study was to extend the literature on couple typologies in a number of ways. First, previous analyses of couples aimed at producing couple typologies used community samples. This study was the first to examine such presentations in couples in active treatment. Second, due to the nature of previous research examining non-treatment-seeking couples, previous research has not examined within treatment behavior. The present study evaluated couple behavior during their first session of ABCT. Third, previous research only had examined couple typologies in the context of relationship stability and quality. The current study investigated whether couple typologies were associated with relationship variables and individual psychopathology, specifically alcohol problems.

Based on existing research, it was hypothesized that couples could be reliably classified into four types based on their interactions during their first session of ABCT. The results of the current study supported this hypothesis. A cluster analysis of couple verbal behavior yielded a viable four cluster solution. The four couple types were validator, avoider, hostile, and ambivalent-detached. Validator couples exhibited high rates of positive behavior relative to negative behavior and presented with high levels of relationship satisfaction. Avoider couples exhibited minimal valenced behavior and also had high levels of relationship satisfaction. Ambivalent-detached couples exhibited a mix of positive and negative behavior and poorer relationship satisfaction. Hostile couples exhibited greater rates of negative behavior compared to positive behavior and had poor relationship satisfaction. Furthermore, couple types were significantly different from one another based on their observed verbal behavior, support, collaboration, and contemptuousness; couples types were distinguishable on their presenting self-reported relationship satisfaction as well. The characteristics of the couple types identified in the present study closely replicate those found in previous research. The similarities and differences between the current couple types and previously established couple types will be discussed in more detail below.

In addition to testing whether couples could be adequately classified based on their clinical presentation, the current study aimed to examine whether couple type predicted treatment response in terms of alcohol use outcomes. It was hypothesized that couples would have different treatment outcomes based on their presenting couple type membership. As this was the first examination of couple type on an alcohol use outcome, no directional hypotheses were made beyond the hypothesis that couple type would

predict treatment response (e.g., type A couples would respond more positively to treatment, type B couples less so). The results of the current study did not support this hypothesis, as couple type was not significantly associated with alcohol use outcome, either in terms of specific follow-up points or by treatment response trajectory. Similarly, support was not found for the hypothesis that IP gender would moderate any potential effects of couple type on treatment outcome. Despite the lack of support for these particular hypotheses, this study provides the first integration of the couple typology literature with research on couples in conjoint alcohol treatment. In addition to discussing the findings of the current study as it relates to the larger general couples literature, the findings within the context of the ABCT literature will be discussed as well.

Study Findings in the Context of Previous Couple Typology Research

Multiple researchers have called for further study of couple typologies as a theoretically and clinically useful strategy for integrating a plethora of information into meaningful descriptions (e.g., Fisher & Ransom, 1995; Olson, 1981). Previous research has examined couple typologies in a variety of community sample of couples. As Givertz and colleagues (2009) commented, the findings from these studies have been surprisingly similar, with researchers using a range of data collection and statistic techniques arriving at a small number of conceptually and descriptively similar types of couples. Although the exact number of types has been seen to vary slightly (e.g., Lavee & Olson [1993] found evidence for as many as seven couple types), a number of studies using vastly different sources of data and analytic strategies have arrived at four types of couples whose presenting characteristics are found relatively consistently (in fact, Lavee & Olson went on to create four superordinate couple types on conceptual grounds after further

examination of their findings). The present study serves as further replication of research establishing the existence of four distinct types of couples; furthermore, the four types of couples found in this study share a number of characteristics with couple types found across other studies (e.g. Fisher & Ransom, 1995; Fowers & Olson, 1992; Gottman, 1993).

Cluster 1 couples were characterized by relatively low levels of both positively and negatively valenced verbal behavior. However, these couples did engage in positive-to-negative behaviors at a ratio of two to one, indicating they emitted positive utterances twice as frequently as negative ones. Although the current study does not allow for an in-depth exploration of the function of low affect in the relationship, this has some implications in the context of the role of alcohol in the relationship. A more detailed discussion of this topic is provided in the next section on ABCT-specific mechanisms. Not surprisingly, Cluster 1 couples were neither particularly supportive nor unsupportive, falling in the middle of the General Support scale, which indicates a rather neutral stance in terms of one another's goals and concerns. Relative to the rest of the sample, these couples were about average on general support. This makes sense when one considers that these are couples that tend to avoid expression of affect, and thus may be uncomfortable and/or have difficulty expressing either encouragement and assistance or disagreement and resistance. Interestingly, these couples did display support for alcohol treatment and abstinence. However, this level of alcohol-specific support was slightly lower when compared to the average of the overall sample. The implications of these findings will be discussed in more detail in the following section. As couples that tended to avoid emotional expression, Cluster 1 couples tended to work moderately well together

as evidenced by a Collaboration score above the midpoint on the raw scale and greater than the average of the sample as a whole. Although not directly assessed, this collaboration likely may be explained more by the lack of disagreement and argument than active problem-solving and engagement in these couples. In line with this hypothesis, Cluster 1 couples tended to be warmer towards one another than not based on their Contempt scores and were lower on the Contempt scale when compared to all couples, but this warmth and appreciation tended to be more implicit than overt as their Contempt scores were closer to the middle of the scale. Overall, Cluster 1 couples appeared to avoid expressing much affect, be it positive or negative, via their verbal behavior. As a result, they tended to be neither supportive and warm nor unsupportive and disdainful. They appeared to work well together, perhaps because they avoided difficult or emotion-laden topics. In the end, these couples were relatively satisfied in terms of the quality of their relationship, likely because they avoided contentious issues, which may have long-term costs in the service of short-term harmony. This presentation is very similar to the presentation observed in the avoider couples described by Gottman (1993). Although a measure of relationship satisfaction was not used, Gottman's avoider couples were considered stable based on lower rates of divorce and serious consideration of divorce. Cluster 1 couples endorsed a higher level of relationship satisfaction based on average ACQ scores. Thus, both the present study and Gottman (1993) identified one couple type defined by relatively stable and satisfied relationships and low levels of valenced affect expression. One notable difference between Cluster 1 couples and Gottman's avoider couples pertains to the ratio of positive-to-negative behaviors; Gottman found a five-to-one ratio compared to the two-to-one ratio in the current study.

Cluster 2 couples were characterized by high levels of positive behavior and moderately low levels of negative behavior compared to other couples. The ratio of positive-to-negative utterances was five-to-one. Cluster 2 couples were very supportive of alcohol treatment and abstinence, evidenced by the fact that their Alcohol-Specific Support scores were on the very high end of the scale. As expected, they also had the highest score on General Support relative to all other couples as well. This high level of support in two domains may have served to increase their relative rates of positive behavior while at the same time lowering their negative behavior (e.g., the current coding system would have included a potential SO criticism of IP drinking under positive behavior [Change Talk] rather than negative as it would have been under Gottman's system). Based on the codes for positive verbal behavior included in the present study, this means that Cluster 2 couples expressed much more encouragement and support, both generally and in terms of alcohol treatment, than criticism or support for drinking. Therefore, partners tended to present as validating of one another's opinions and concerns in a treatment context. Cluster 2 couples scored on the high end of the Collaboration scale, and on average had higher ratings for this code compared to other couples overall. This fits the concept of these couples as validating and willing to work together, even in spite of differences. And not surprisingly, these couples on average had the lowest scores for Contempt, indicating they expressed warmth and caring to one another and avoid disdain and disgust. In the end, Cluster 2 couples appeared to be in highly functioning, well-adjusted relationships. In fact, they had the lowest average ACQ score and their ACQ scores were significantly than Cluster 3 and 4 couples, indicating greater relationship satisfaction than those other couples. This presentation is most

similar to Gottman's description of his validator couples, in which partners provide support and empathy and communicate understanding and acceptance even in the face of disagreement. Gottman's validator couples, while expressing greater amounts of positive behavior than negative, expressed moderate-to-high levels of positive behavior and moderate levels of negative behavior. This varies slightly from the high levels of positive behavior and low levels of negative behavior in the current study. This difference in presentation may be explained by the inclusion of alcohol-specific goals (and codes) in the current study as discussed earlier.

Couples from cluster 3 exhibited moderate levels of positive behavior and extremely elevated levels of negative behavior. This resulted in these couples being the only couples in which the frequency of negative behavior was greater than the frequency of negative behavior compared to the other couple types; these couples had the lowest average General Support, although this was not significantly different from all other couples. They did exhibit significantly lower Collaboration, scoring on average almost a full point below the next lowest couple type. In other words, these couples were not interested in working together and/or had a difficult time engaging constructively. Similarly, Cluster 3 couples were significantly elevated on the Contempt scale, meaning that partners expressed a high level of disgust and disdain towards one another with minimal warmth or appreciation. As one would expect, Cluster 3 couples had the highest scores on the ACQ, indicating that these couples were much more dissatisfied in their relationship. Put all together, these couples most closely resembled Gottman's hostile couples. Gottman's typology research yielded similar results, in that only one of his four couple types exhibited a different pattern of positive-to-negative behaviors, the hostile

couples. This description seems appropriate for Cluster 3 couples as well. Interestingly, these couples fell on the higher side of the scale for Alcohol-Specific Support, although this higher level was not significantly different when compared to the other three types of couples.

Cluster 4 couples exhibited moderate levels of both positive and negative behavior. Although positive behavior was seen more frequently than negative behavior, the ratio of positive-to-negative behavior was less than for Cluster 1 or 2 couples. Additionally, even though these couples expressed levels of General Support on the lower side of the mid-range of the scale, this was significantly lower than the satisfied couples, Clusters 1 and 2. Alcohol-Specific Support was also lower than in the entire sample, although it was on the positive side of the raw scale. Collaboration was in the middle of the scale, but significantly lower compared to Cluster 1 and 2 couples. Similarly, average raw score for Contempt in Cluster 3 couples was in the middle of the scale, and these couples fell between the two groups of satisfied couples and Cluster 3 couples. Interestingly, average relationship satisfaction in these couples was moderate; their mean ACQ score was significantly higher than the couples in clusters 1 and 2. Cluster 4 couples represent a couple type that most departs from the couple types described by Gottman (1993). Gottman's remaining couple type, volatile, were characterized by high levels of both positive and negative behaviors while still maintaining a higher ratio of positive-to-negative behavior. Overall, Cluster 4 couples express a lack of support and did not work well together, while also displaying a lack of warmth. They engaged in a moderate level of both positive and negative behavior, perhaps suggesting that these couples may start out with good intentions but fall into negativity out of frustration when attempts to

problem-solve or work together are ineffective. Perhaps a better description of these couples would be ambivalent-detached couples. They mix their positive and negative behavior and are neither supportive nor unsupportive, collaborative nor combative, contemptuous nor warm.

The current study found evidence for four types of couples seeking ABCT. This replicates previous findings from the general couples literature suggesting that couples can be reliably and robustly clustered into four types based on presenting characteristics. Additionally, the defining characteristics of the couple types in the current study are largely consistent with previous typologies (e.g., Gottman, 1993), suggesting that couples dealing with alcohol problems can be categorized similarly to couples at large. Of note, Gottman did not distinguish between his three types of stable couples in terms of relationship quality. However, other researchers have suggested that although validator, volatile, and avoider couples all have relatively good relationship quality, there are differences, such that validator couples seem to have the highest relationship quality (Holman & Jarvis, 2003). The current study also found evidence that these couples are distinct in terms of relationship satisfaction. In the current sample, validator couples had the highest relationship satisfaction. Interestingly, relationship satisfaction in this group of couples did not significantly differ from satisfaction in avoider couples. This departs from the findings by Holman and Jarvis (2003), and suggests that avoidance of conflict may serve a different function in couples where alcohol is a problem than couples without alcohol problems. This will be discussed in more detail in the next section. Ambivalent-detached couples had significantly poorer relationship satisfaction. Hostile couples had the lowest relationship satisfaction, although their satisfaction did not differ

significantly from ambivalent-detached couples. The results of the current study suggest that in couples struggling with alcohol problems, there are two approaches to interactions that may be adaptive; engagement and validation of one another, even in the face of disagreement, and avoidance of discussing tough topics appear to result in greater levels of relationship satisfaction than couples that are combative or couples that send mixed messages.

Study Findings in the Context of ABCT Research

In addition to examining the current findings within the context of the general couple typology literature, discussion of the couples types found in this study and ABCT-specific literature is warranted. First, a discussion of the lack of significant findings for alcohol use outcome by couple type is warranted. This was the first study to develop and examine a couple typology in the context of alcohol treatment. In fact, a review of the literature suggests that this is the first study to examine the effect of couple type on treatment outcome of any kind (other typology studies that have investigated longitudinal outcomes have been in naturalistic settings). Some research has indicated that specific presenting variables impact response to treatment in terms of relationship satisfaction. For example, more severely distressed couples tend to do worse in couple therapy (Jacobson & Addis, 1993). According to the hypothesized mechanisms posited by ABCT, such relationship variables should be associated with alcohol use. The current results suggest that a couple's presentation in terms of their interactions during their first session of treatment did not predict response to treatment in terms of alcohol use. Due to the nature of the current study, it is difficult to determine what to make of this finding. One possible explanation is simply that relationship functioning and drinking may be less

related than the underlying theory for ABCT suggests. Previous research supports this concept as well (e.g., McCrady et al., 2004). Another potential explanation is that the behaviors assessed to determine couple type in this study were precisely the behaviors targeted by the actual therapy. Because these behaviors were only assessed at the first treatment session, it is impossible to know how couples responded to treatment in terms of their behavioral interactions. Thus, the nonsignificant findings for alcohol outcome could possibly be explained by couples adopting positive communication and coping skills during the course of therapy to the extent that differences in behavioral presentation between couple types became negligible. Research has already shown that adoption of targeted relationship behaviors is related to alcohol outcome (McCrady et al., 2002; O'Farrell et al., 1993). Despite the inability to investigate the within-treatment processes as mediating pathways between couple type and treatment outcome, this study still produced a number of implications for the study of couple interactions in the treatment of alcohol problems.

This study was the first to examine couple typology based on couple interactions of couples where one partner is seeking treatment for an alcohol problem, and the presenting characteristics of the couples in the current study are consistent with previous research on couples where alcohol is a problem. However, overall in the current sample, couples tended to exhibit lower rates of positive behaviors relative to negative behavior than previous research. Gottman (1993) found that for three of his four couple types (the stable couple type), couples displayed positive behaviors five times as often as negative behaviors. In the current sample, only one of the couple types reached this ratio; two other types had greater frequencies of positive behaviors relative to negative behaviors,

but at lower ratios. This is not surprising when one considers previous findings on interactions of couples managing alcohol problems. These couples have been shown to exhibit less positive behavior and greater rates of negative behavior compared to couples where alcohol is not a problem (Billings, Kessler, Gomberg, & Weiner, 1979; Jacob & Krahn, 1988; Jacob & Leonard, 1992). Based on such previous findings, one would expect lower ratios of positive to negative behaviors in the current example. Thus, this study provides further support that couples struggling with alcohol problems also struggle in terms of their affective expression. Interactions and communication suffer in ways that general BCT theory predicts would impact overall marital quality. This may lead to greater levels of distress and conflict in such couples, and in fact divorce rates are higher for individuals with alcohol dependence than any other psychological disorder (Halford et al., 1999). These findings further support the need for and importance of treating alcohol problems within a couple framework, as alcohol affects the system, not only the individual.

Another interesting finding in the current study as it relates to the treatment of alcohol problems within a couple context is that relative levels General Support and Alcohol-Specific Support were not correlated across couple types. Of note, this finding should be considered cautiously in light of the poor reliability for the coding of Alcohol-Specific Support. That said, in Cluster 1 couples General Support was slightly higher than average and Alcohol-Specific Support was slightly lower than average. Both forms of support were well above average for Cluster 2 couples. General Support was substantially below average in Cluster 3 couples, yet Alcohol-Specific Support was slightly higher than average. Finally, both forms of support were below average in

Cluster 4 couples. Examination of the existing research suggests that this is the first study to parse and examine general and alcohol-specific support in the same couples. Based on the current findings, it appears that the two forms of support have different influences. This is consistent with the larger social support literature examining alcohol problems, as general and alcohol-specific support have been shown to be distinct constructs that contribute unique variance when predicting alcohol outcomes (Beattie & Longabaugh, 1999). Even as couple types were defined by higher or lower Alcohol-Specific Support relative to the overall sample mean, couple types were universally elevated on the Alcohol-Specific Support scale. This makes sense as the sample was comprised of SOs who were willing to participate in treatment for their IPs' alcohol problems. However, the current findings also suggest that not all support for alcohol-related goals is the same and should be considered within a larger context of the couple presentation. Here is where the advantage of a couple typology is realized as these findings can be discussed within the context of the larger clinical presentation.

For example, despite falling on opposite sides of the sample mean in terms of Alcohol-Specific Support, Cluster 1 and 2 couples both had higher General Support. These two couple types also were characterized by greater levels of relationship satisfaction. Cluster 1 couples previously were characterized as avoider couples based on their low levels of expressed valenced behavior. Previous literature has suggested these couples tend to avoid conflict (Fisher & Ransom, 1993; Gottman, 1993). Thus, it would be easy to hypothesize that Cluster 1 couples appear generally supportive due to lack of conflict, yet this results in a lack of alcohol-related support due to avoidance of this contentious subject. On the other hand, Cluster 2 couples may not avoid the topic of

alcohol and feel more comfortable discussing it effectively. These couples were previously characterized as validators, a type of couple that previous research has shown to be effective in engaging and resolving conflict (Fisher & Ransom, 1995). Thus, these couples may not avoid discussion of alcohol-related goals, instead providing support for treatment and sobriety in an encouraging manner. Cluster 3 and 4 couples were both characterized by below average General Support. Yet like Cluster 1 and 2 couples, they fell on opposite sides of the sample mean Alcohol-Specific Support. Cluster 3 couples were described as hostile. Therefore, it makes sense that they were not supportive in general (i.e. encouraging and emotional supportive). Alcohol-Specific Support was coded slightly differently, and was based on an SO's support for and encouragement of treatment and abstinence, even if these were not goals for the IP. Thus, one can imagine SOs in this couple type as frustrated by their partner's drinking and expressing support for abstinence in a critical and accusatory fashion. Cluster 4 couples were characterized as ambivalent-detached. This ambivalence-detachment appears to extend to both general and alcohol-specific areas of content as these couples expressed mixed messages of support based on their locations on the scales of the two forms of support.

Another finding in the present study that is important to discuss in the context of ABCT is the distribution of couples across couple types in the current sample in comparison to the distribution of couples in community samples. In his sample, Gottman (1993) classified 15% of couples as avoider type, 19% as validator type, 49% as hostile type, and 17% as volatile type. In the current study, 44% of couples were classified as avoider type, 20% as validator type, 6% as hostile type, and 30% as ambivalent-detached type. At first glance, the distribution of couples in the current sample is quite different

from the comparable Gottman type. However, the current findings appear consistent with previous research. Over thirty years ago, Steinglass (1976) posited that drinking can serve an adaptive function in families that may in turn reinforce problematic levels of drinking. To this end, Jacob & Krahn (1988) found that alcohol consumption prior to an interaction task led to greater expression of affective behavior, both positive and negative, in couples compared to a no-alcohol interaction. This finding suggests that from a systems perspective, alcohol serves to increase affective expression. Thus, a common adaptive function of drinking in a relationship may be to increase communication and displays of emotion. Jacob & Krahn (1988) also found that this effect was greater for couples in which the husband met criteria for an AUD than in control couples (this study did not include couples where the female met criteria for an AUD). Based on the high number of couples classified as avoider in the current sample, the current study suggests that couples presenting for ABCT are likely to struggle with expressing emotion and managing conflict without alcohol. To be clear, the current analyses do not allow any causative statements to be made. Further research is needed to examine the developmental trajectory of alcohol problems within a couple. However, the findings of this study add to the research that suggests alcohol problems develop within a system that reinforces drinking due to difficulties with communicating affect and resolving conflict.

Limitations of the Present Study

The current study has a number of limitations. One major limitation of the current study was the low reliability of some of the behavioral codes used for the analyses. Although only Alcohol-Specific Support fell in the poor range of clinical significance as described by Cicchetti (1994), a number of other codes fell in the fair range. Ideally, the

reliability across coders would be higher, allowing for greater power to draw definitive conclusions regarding the accuracy and generalizability of the current findings. As such, further study and replication of the present findings is needed before more conclusive statements can be made about the presentation of couples seeking treatment for alcohol problems. One possible explanation for the poor reliability of some codes may be related to the difficulty defining the behaviors that are being coded. Within the context of ABCT, SOs are faced with potentially conflicting goals; being positive and supportive and at the same time expressing disapproval of IP drinking and advocating for change. This is a paradox that SOs must struggle with, and something that researchers also may struggle to adequately capture and quantify. Based on the results, the codes used for the present study perhaps could be reconsidered to better capture the juxtaposition of *validating one's efforts to this point* and *pushing for change* that SOs of problem drinking individuals face. Of note, although not reported in this manuscript, a post-hoc examination of the results of the cluster analysis omitting the Alcohol-Specific Support variable resulted in a very similar four cluster solution as the results reported in the current study when that variable included. Thus, the couple types identified in the current study appear to be stable despite the poor reliability of Alcohol-Specific Support.

Similarly, the internal consistency of the behavior code categories was poor. As mentioned previously, this was not unexpected due to the theory-driven data reduction strategy utilized. However, this finding does indicate that further research is needed to examine if there are better ways to capture valenced verbal behavior in couples struggling with alcohol problems. In the current study, behavior was considered positive or negative regardless of whether it was occurring within an alcohol or general relationship context.

Perhaps distinguishing between the sources may be useful, and could offer further evidence for the different pathways be which ABCT influence productive change. That said, the categorization of couple behavior in the current study also can be considered a strength from a clinical perspective as it collapsed all couple interactions into three simple groups that offer predictive information in terms of relationship satisfaction. Thus, the results of this finding suggest that clinicians may be able to simplify the behavioral presentation of couples and make use of superordinate classes of behavior to guide clinical judgment and decision-making. Of course, additional research will be needed before definitive statements can be made about the most appropriate strategy for reducing the plethora of presenting information into useful categories.

A second limitation of the current study was that ACQ data were only available from the baseline assessment. Thus, it was not possible to examine whether couple type was associated with relationship satisfaction outcome during and after the course of treatment. This limited the potential predictive information of couple type on relevant and clinically useful variables. Additionally, relationship satisfaction was only available for the IP across all four studies. Although partners' ratings of relationship satisfaction often are highly correlated, it would have been helpful to have both partners' ratings.

Additionally, couple type was determined based on the behavioral presentation of couples in the first treatment session. Thus, the current study does not provide information on whether couple type was stable across the course of treatment. In one of the few studies to examine couple types over time, Kamp Dush & Taylor (2012) found evidence for couple types similar to those presented by Gottman (1993) and that the level of conflict that defined couples remained relatively stable over time. However, this study

was of a study of non-treatment-seeking community couples. It is possible that couples in therapy change their couple type as they learn relationship skills (e.g., positive communication, conflict resolution skills). Unfortunately, this study did not assess stability of couple type during treatment and whether change in couple type was associated with treatment outcome.

A third limitation is the relatively small size of some clusters of couple type, namely cluster 3 ($n = 10$). Due to the small cluster size, the power to detect significant effects of couple type was reduced. This is even truer for the tested moderation effects. Although the overall sample was of adequate size for the cluster analysis, the subsequent tests of the effects of couple type on alcohol use outcome were likely underpowered, thus limiting the ability to make conclusive statements about the presence or absence of a significant effect. This limitation was compounded by the fact that follow-up rates varied by assessment point (ranging from 57-95%). While the analytic strategy used in the current study minimized this issue as it did not require listwise removal of cases with missing data, the number of couples in a given couple type at a given assessment point still may have been quite small due to missing data at that time point, rendering it unlikely a significant effect could be established.

Another limitation of the current study is the relative homogeneity of the sample on some characteristics. For example, the current sample was predominantly Caucasian, thus it is difficult to apply the current findings to minority couples. Additionally, the current sample consisted entirely of heterosexual individuals, the vast majority of whom were married (as opposed to other forms of committed intimate relationships). Although this limitation, as well as the ethnicity limitation, applies to the larger literature on couple

therapy, it leaves out a number of other populations that would benefit from further study. For example, these limits on generalizability make it hard to assess whether similar couple types exist in minority couples or non-heterosexual couples.

Strengths of the Current Study

The present study also had a number of strengths. One strength is that observational data of actual couple behavior were utilized. Previous researchers have concluded that observational data of couple behavior and interactions provide a valid and powerful method for quantifying important information about a relationship (e.g., Gottman & Notarius, 2000; Heyman, 2001). Thus, the variables selected for inclusion in the cluster analysis likely have good ecological validity and capture central aspects of the processes involved in determining whether a relationship is satisfactory or not. Moreover, the observational data from this study were cross-validated against self-report data, further strengthening the ability to draw meaningful conclusions about relationship variables in couples presenting for ABCT by utilizing multiple sources of data.

A second strength pertains to the method by which relationship quality was measured. Frequently in the general couples literature, relationship quality is assessed by relationship stability. Unfortunately, relationship status is only a single dimension of relationship quality and one that may not even be all that informative. After all, couples that remain together can be highly distressed and sometimes, as two leading couple therapy researchers point out, sometimes facilitating an amicable divorce/separation may be a satisfactory outcome for therapy (Jacobson & Christensen, 1996). The current study measured relationship quality using the ACQ, a well-validated instrument that assesses relationship satisfaction as a continuous variable (Fals-Stewart et al., 1993), but not

relationship status. Not only does a measure of relationship quality better capture the experience of the couple, but it also increases the power to detect effects by providing a continuous outcome variable rather than a categorical (and often dichotomous) one.

A third strength of the current study is that it examined the predictive power of typology on an outcome of interest over time. Almost all of the literature on couple typologies has been cross-sectional. Thus, the current research provides strong concurrent validity for the utility for classifying couples by types; however, the impact of couple type on relationship trajectory is relatively untested. Even though the current study was not able to examine the effect of couple type on relationship satisfaction over time, it did investigate how couple type was associated with alcohol use, another outcome variable, over a yearlong period.

Another strength was that the current sample was comprised of couples who were actively seeking treatment. Much of the couples typology literature is based on community samples of couples. Due to selection bias, it would be easy to make the assumption that couples seeking treatment would represent a skewed sample (i.e. would present with greater relationship distress than a random sample of couples from the community). This study adds to the limited information on the presentation of couples in treatment settings. However, couples in the current sample were presenting for both couple therapy and treatment of alcohol problems. Thus, caution is needed in extending the findings of the current study to all couple therapy. For example, some couples presenting for ABCT may be quite satisfied with their relationship, hence the presence of a supportive spouse willing to participate and help their loved one resolve their problem with alcohol.

Although the current sample was relatively homogenous on a number of demographic variables, another strength of the current study was that it including couples in which the female partner presented with an alcohol problem, not just the male partner. The vast majority of previous research on couples and alcohol problems has only considered samples where the male partner had the alcohol problem. Thus, the findings can be generalized to a wider range of couples with alcohol problems, regardless of which partner struggles with an alcohol problem.

Finally, this was the first study to examine the impact of couple type on outcomes other than relationship quality. Using a theory-driven approach, it was hypothesized that couple type (which is associated with relationship quality and stability in the general couple literature) would be associated with alcohol use outcomes in couples receiving ABCT. Although the current study yielded nonsignificant results, it represents a novel application for testing the theoretical framework for couple-focused treatments of individual disorders and clinical utility of developing couple typologies in couples seeking such treatments. As a meaningful integration of relevant data, couple typologies represent a strategy for examining the impact of intimate relationships on a range of health outcomes. Given that a large body of evidence indicates the advantages of involving spouses in the treatment of a wide range of physical and mental health disorders, utilization of couple types could yield a new area of knowledge and investigation.

Implications for Clinical Practice with Couples Struggling with Alcohol Problems

The findings from the present study have several implications for future clinical applications and research. The major finding of the current study was that couples

seeking couple therapy for alcohol problems were observed to have similar presentations to community samples. Thus, clinicians providing ABCT can feel confident that general BCT techniques are likely to be appropriate and useful in this population. Similar to couples in general, characteristics of couple interactions in these alcoholic couples, such as the expression of positive and negative affect and ability to collaborate and problem-solve together, are associated with relationship satisfaction. In fact, couples struggling with an alcohol problem may be particularly at risk for presenting with behavioral patterns indicative of poor relationship satisfaction (e.g. lower rates of positive-to-negative affect, lack of warmth and appreciation), the behaviors that couple therapy is designed to target and change.

The present study also has implications for clinicians specifically treating couples struggling with alcohol problems. For example, as mentioned before, in the current sample rates of positive-to-negative behaviors were much lower in the majority of couples than rates seen in couples without alcohol problems. This is important, as the 5:1 ratio of positive-to-negative behaviors has been shown to robustly predict relationship stability (Gottman, 1993). Yet only one type of couple (validator), representing 20% of the total sample, reached this ratio in the current study. At the same time, the frequency of negative behavior was not terribly high for most couple types. Thus, a clinician can be safe in assuming that couples presenting for treatment for alcohol problems are going to suffer from a lack of positive interactions. This finding suggests that an ABCT clinician wants to be attentive to any positive affective expression and work to reinforce that behavior within these couples. This was particularly true for avoider couples, which represented a large proportion of couples in the current sample. As couples in treatment

for alcohol problems appear more likely to avoid conflict and emotion, clinicians providing ABCT want to be very attuned to this fact, not only reinforcing and promoting expression of positive affect, but also attending to instances of avoidance of conflict or disagreement as such moments provide teachable moments to help the couple engage in productive and positive problem-solving and conflict resolution.

Another implication of the current study pertains to the results suggesting that couple type during initial presentation for treatment does not have a significant effect on alcohol use outcomes of the IP. From one perspective, this is encouraging as this finding suggests that couples respond to treatment similarly in terms of alcohol use outcomes, regardless of their presenting behavioral interactions. However, couple type does distinguish couples based on their presenting relationship satisfaction and in-session behavior. Thus, clinicians want to be aware of the patterns of behavior during the treatment session, as this is associated with relationship satisfaction outside of session. Relationship satisfaction is an important component of getting couples engaged in therapy, as a foundation of goodwill and positive expectations are critical to building trust. Trust is required in order to get couples to implement new skills, as partners need to know they can count on their spouses. As the current study captured behavior at the utterance and global level and integrated these levels of behavior into meaningful descriptions, clinicians need to be able to pay attention to both levels of behavior during session. This has implications both for clinicians providing ABCT and how clinicians should be trained to provide ABCT.

Conclusion and Future Directions

In summary, the results of the present study suggest that couples seeking treatment for alcohol problems can be reliably and robustly classified into one of four couple types based on observation of their interactions during the initial therapy session. Each couple type was characterized by a unique profile that included level of positive and negative behavior, general and alcohol-specific support, collaboration, and contempt. Couple type membership was significantly associated with overall relationship satisfaction. Couple type was not associated with alcohol use, however, either at baseline or during and after treatment.

Ultimately, although providing some interesting results and suggestions in terms of ABCT theory and application, the current study serves to highlight the areas where ABCT researchers and clinicians need to gather more information and empirical evidence. The current study reinforces the concept that not all couples with alcohol problems present to treatment with similar behavioral profiles, mirroring findings from the general couples literature. Further study is needed to investigate the function of alcohol within a relationship. For example, it may be useful for clinicians to make a specific assessment goal to gather information on the role of alcohol on the expression of emotion within the couple. This may offer additional insight into the etiology and maintenance of alcohol problems and provide the couple more insight into how some of their interactions depend on alcohol. Additionally, with more knowledge about how the presenting profile of a couple is related to treatment outcomes, such information can be made available in real-time to a clinician who is looking for specific signs of emotional avoidance and allow that provider to address that issue more readily. To answer some of

the questions raised in the present study, additional research needs to be directed towards

examining whether couple type has an effect on in-session couple behavior change during

treatment and relationship quality during follow-up. It may be that such change mediates

the relationship between treatment and alcohol outcome. By investigating such lines of

inquiries, researchers and clinicians will better be able to identify the most salient aspects

of a couple's presentation and intervene accordingly.

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Figure 1. Dendrogram using Ward linkage
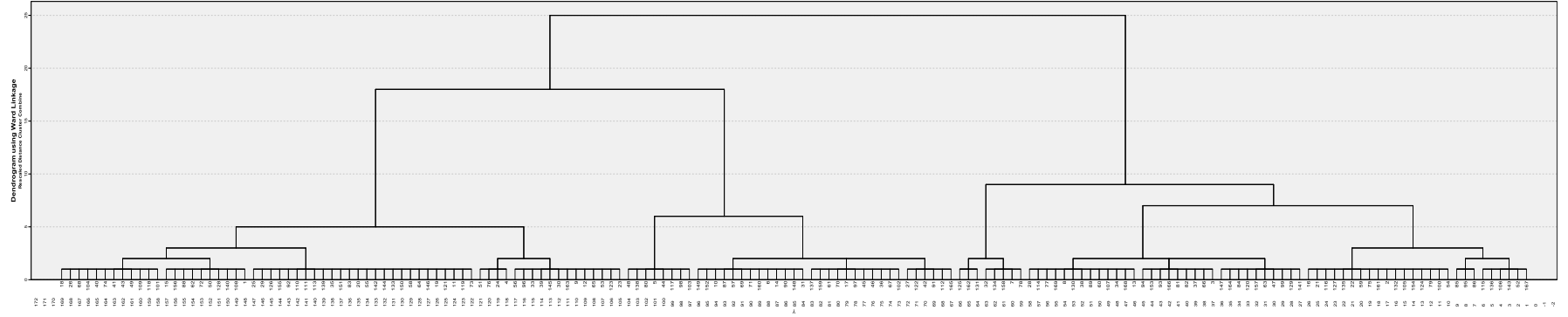
Figure 2. Percent days abstinent (PDA) over time by couple type
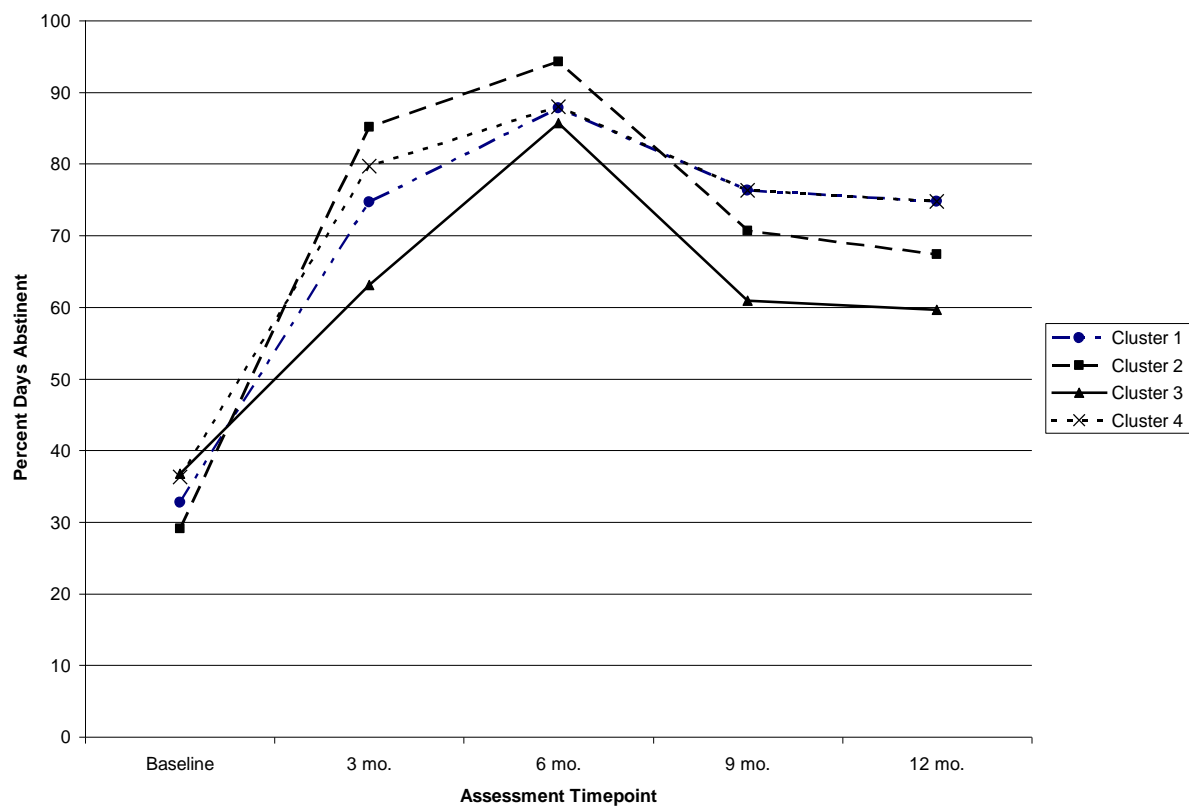
Table 1. Description of Gottman's couple types

Type	Relationship Quality	Positive Behavior	Negative Behavior
Validator	stable	↑	↓
Volatile	stable	↑	↑
Avoider	stable	↓	↓
Hostile	unstable	↓	↑

Gottman (1993) found that stable couple types showed a greater rate of positive behaviors than negative behaviors, hostile couples were the only couple type of have a greater rate of negative behaviors compared to negative behaviors.

Table 2. Inclusion/exclusion criteria by original study

	PACT	MEN	WTPI	WTPII
Inclusion Criteria				
21-60 years old	X			
Male IP	X	X		
Female IP	X		X	X
Current Relationship Criteria:				
Married	X	X	X	X
Married, separated, or cohabiting for at least 6 mos.		X	X	X
Married, cohabiting for at least 6 mos., or in committed relationship of at least 1 year with intent to continue			X	X
Partner willing to participate in treatment	X	X	X	X
IP Current Drinking Problem Criteria:				
Drinking problem for 2+ years	X			
Consumed alcohol in past 60 days	X	X	X	X
Score of 5+ on MAST	X			
Current drinking problem (4+ on MAST in past year)		X		
Experienced 4+ problems due to drinking in past 12 mos.	X			
Current alcohol abuse or dependence (DSM-IV criteria)			X	X
Exclusion Criteria				
SO or IP abusing or physiologically dependent on drugs	X	X	X	X
IP psychotic	X	X	X	X
SO psychotic		X	X	X

	PACT	MEN	WTP1	WTP2
IP evidence of significant cognitive impairment	X	X	X	X
SO evidence of significant cognitive impairment			X	X
Evidence of current alcohol abuse by SO	X	X		
Evidence of domestic violence in past 12 months			X	X
Currently in other treatment, unwilling to discontinue	X			

PACT = Program for Alcoholic Couples Treatment, MEN = Men's Relapse Prevention Study, WTP1 = Women's Treatment Project I, WTP2 = Women's Treatment Project II, MAST = Michigan Alcoholism Screening Test.

Table 3. Mean percent days abstinent (PDA) over time by study

Time point	Original Study				p
	PACT (*n* = 19)	MEN (*n* = 58)	WTP1 (*n* = 44)	WTP2 (*n* = 48)	
Pretreatment	34.5 (30.6)	40.0 (32.4)	31.3 (29.7)	26.7 (24.7)	0.139
3-month Follow-up	94.8 (7.8)	79.0 (27.6)	76.6 (25.7)	70.1 (29.2)	0.008
6-month Follow-up	96.1 (9.3)	91.9 (18.0)	87.9 (20.2)	81.4 (32.1)	0.175
9-month Follow-up	81.3 (29.8)	82.5 (32.1)	78.8 (29.9)	58.2 (37.5)	0.004
12-month Follow-up	79.3 (30.9)	82.2 (30.0)	76.7 (34.4)	55.3 (40.9)	0.003

Mean (SD) PDA in the previous three months is provided. Follow-up periods are anchored to the first treatment session. For all but seven cases (all in the MEN study), couples completed treatment within six months. Significance-level refers to one-way ANOVA comparing PDA by study. PACT = Program for Alcoholic Couples Treatment, MEN = Men's Relapse Prevention Study, WTP1 = Women's Treatment Project I, WTP2 = Women's Treatment Project II.

Table 4. Basic information on treatment conditions by original study

	Original Study			
Variable	**PACT**	**MEN**	**WTP1**	**WTP2**
Participants	19	58	44	48
Maximum Number of Sessions	15	15	20	12
Length of Sessions (minutes)	90	90	90	90
Maximum Duration of Treatment (months)	n/a	n/a	6	4
Treatment Conditions	ABCT	ABCT	ABCT	ABCT
		ABCT + RP		Blended
		ABCT + AA		

Only treatment conditions relevant to the current study are included. PACT = Program for Alcoholic Couples Treatment, MEN = Men's Relapse Prevention Study, WTP1 = Women's Treatment Project I, WTP2 = Women's Treatment Project II, ABCT = Alcohol Behavioral Couple Therapy, RP = Relapse Prevention, AA = Alcoholics Anonymous.

Table 5. Description of MISO global and behavior codes

Code	Description	Clustering Variable	Coded for SO	Coded for IP
Global				
Support-General	Captures partner's overall support related to other partner's non-alcohol-related goals/concerns		X	X
Support-Alcohol Specific	Captures SO's overall support related to IP's alcohol-related goals/concerns		X	
Collaboration	Captures how well partner problem-solves and communicates with other partner		X	X
Contempt	Captures partner criticism or warmth		X	X
Behavior				
Giving Information-General	Provides general information about partner or couple	Neutral	X	X
Giving Information-Drinking	Provides alcohol-related information about IP or SO response to IP drinking	Neutral	X	X
Encourage/ Support-General	Provides general support, encouragement to, or appreciation of partner	Positive	X	X

Encourage/ Support- Drinking	Provides support or encouragement to IP related to abstinence or treatment	Positive	X	
Giving Advice	Offers advice, a suggestion, or possible action to partner	Positive	X	X
Discuss Self- General	Provides general information about self	Neutral	X	X
Discuss Self- Drinking	Provides alcohol-related information about self	Neutral		X
Direct	Makes a command or order of partner	Negative	X	X
Confront	Conveys disapproval, criticism, or judgment of partner	Negative	X	X
Change Talk	Statements reflecting IP desire, ability, reason, need, or commitment to change alcohol behavior	Positive	X	X
Counter Change Talk	Statements reflecting reasons against changing or barriers to changing IP's alcohol behavior	Negative	X	X
Follow-Neutral	Statements not fitting into other behavior codes	Neutral	X	X

Table 6. Reliability estimates for MISO variables

Variable	IP	SO
Clustering Variable		
Positive Utterances	0.681	0.652
Negative Utterances	0.681	0.398
Neutral Utterances	0.696	0.680
Support-General	0.477	0.477
Support-Alcohol Specific	n/a	0.197
Collaboration	0.579	0.413
Contempt	0.426	0.549
Original MISO Behavior Code		
Giving Information-General	0.94	0.769
Giving Information-Drinking	0.658	0.731
Encourage/Support-General	0.322	0.458
Encourage/Support-Drinking	n/a	0.401
Giving Advice	0.787	0.806
Discuss Self-General	0.397	0.619
Discuss Self-Drinking	0.867	n/a
Direct	0.459	0.714
Confront	0.718	0.434
Change Talk	0.717	0.576
Counter Change Talk	0.647	0.265
Follow-Neutral	0.675	0.654

Values represent two-way, single-measures absolute-agreement intraclass correlation coefficients (ICCs).

Table 7. Descriptives of the original MISO behavior codes and clustering variables

	IP		SO	
	M	*SD*	*M*	*SD*
Clustering Variable				
Neutral Utterances*	86.5	7.0	90.6	6.1
Positive Utterances*	8.6	4.9	6.3	4.6
Negative Utterances*	4.9	4.7	3.1	4.0
Support-General	3.2	0.8	3.5	0.8
Support-Alcohol Specific	n/a		4.0	0.7
Collaboration	3.5	0.9	3.7	0.9
Contempt	2.5	1.1	2.4	1.1
*Original MISO Behavior Code**				
Giving Information-General	11.3	6.4	20.5	8.6
Giving Information-Drinking	2.5	2.4	15.2	8.6
Encourage/Support-General	0.3	0.6	0.7	1.2
Encourage/Support-Drinking	n/a		1.7	2.3
Giving Advice	0.3	0.8	0.7	1.0
Discuss Self-General	27.6	11.4	35.8	11.0
Discuss Self-Drinking	25.6	9.0	n/a	
Direct	0.3	0.6	0.6	0.8
Confront	1.4	3.3	1.8	3.6
Change Talk	7.8	4.7	3.3	3.2
Counter Change Talk	3.1	2.7	0.7	0.9

| Follow-Neutral | 19.4 | 9.4 | 19.1 | 10.7 |

*values represent relative frequency of that code.

Table 8. Results of multivariate tests of hierarchical solutions with 3-6 clusters

Clustering Variable	Number of Clusters in Solution			
	3	4	5	6
Neutral	36%	**45%**	**53%**	**58%**
Positive	26%	27%	**48%**	**61%**
Negative	34%	**70%**	70%	72%
SG	34%	**39%**	42%	45%
SAS	51%	52%	52%	53%
Collaboration	51%	54%	56%	**61%**
Contempt	49%	53%	54%	58%

Multivariate Test Estimate

1-Wilks' Lambda	0.844	0.932	0.955	0.974
Roy's Largest Root	1.75	3.43	3.49	4.01
smallest group n	35	8	7	7

Values for each clustering variable in the top half of the tables refer to Eta-squares formatted as percents (i.e. variance accounted for in the solution by that variable). Values in bold font represent an increase of 5% or more from the n-1 cluster solution.

Table 9. Cluster centers for the seven MISO variables in a 4-cluster solution

Behavior	Cluster			
	1	2	3	4
Neutral Utterances	0.670	-0.387	-1.931	-0.324
Positive Utterances	-0.609	1.016	0.172	0.180
Negative Utterances	-0.394	-0.403	2.435	0.258
General Support	0.135	1.081	-1.628	-0.612
Alcohol-Specific Support	-0.168	1.055	0.225	-0.511
Collaboration	0.341	0.994	-1.799	-0.828
Contempt	-0.415	-0.844	1.671	0.863

All variables are z-scored, so positive values indicate cluster centers that are greater than the sample mean,

negative values indicate cluster centers less than the sample mean.

Table 10. One-way ANOVA of cluster by the seven MISO clustering variables, baseline

ACQ score, and baseline PDA

Variable	Cluster				p
	1	2	3	4	
Neutral Utterances	91% [a]	85% [b]	74% [c]	85% [b]	<.001
Positive Utterances	4% [a]	10% [b]	7% [a,b,c]	7% [c]	<.001
Negative Utterances	2% [a]	2% [a]	14% [b]	4% [c]	<.001
General Support	3.2 [a]	3.9 [b]	2.1 [c]	2.7 [d]	<.001
Alcohol-Specific Support	3.9 [a]	4.8 [b]	4.2 [a,c]	3.7 [a,c]	<.001
Collaboration	3.8 [a]	4.4 [b]	1.8 [c]	2.7 [d]	<.001
Contempt	1.9 [a]	1.5 [b]	3.8 [c]	3.1 [d]	<.001
Baseline ACQ	17.5 [a]	13.6 [a]	33 [b]	24.7 [b]	<.001
Baseline PDA	32.7 [a]	29.1 [a]	36.7 [a]	36.3 [a]	ns

p-values are for the overall One-way ANOVA comparing all clusters. For each variable (rows), clusters

(columns) with different superscripts ([a,b,c,d]) differ significantly from one another using a pairwise contrast

at $p < .01$ to correct for multiple comparisons. Based on test of homogeneity of variances, assumption of

equal variance was used for Alcohol-Specific Support, Collaboration, and ACQ, for remaining variables

variance was not assumed equal. ACQ = Areas of Change Questionnaire (lower scores represent higher

relationship satisfaction), PDA = percent days abstinent.

Table 11. Multilevel model of fixed effects of couple type on alcohol use (PDA) during

follow-up

Parameter	β	S.E.	p
Intercept	1.26	0.11	<.001
Baseline ACQ	0.00	0.00	ns
Baseline PDA	0.32	0.09	<.001
Original Study	-0.13	0.03	<.001
Couple Type	-0.01	.02	ns

ACQ = Areas of Change Questionnaire, PDA = arcsine transformed percent days abstinent.

Table 12. Multilevel model of fixed effects of couple type, time, and couple type X time interaction on alcohol use during follow-up

Parameter	*β*	*S.E.*	*p*
Intercept	1.27	0.12	<.001
Baseline ACQ	0.00	0.00	*ns*
Baseline PDA	0.32	0.09	<.001
Original Study	-0.13	0.03	<.001
Couple Type	0.00	0.03	*ns*
Time	0.00	0.00	*ns*
Couple Type*Time	0.00	0.00	*ns*

ACQ = Areas of Change Questionnaire, PDA = arcsine transformed percent days abstinent. Time was coded so that 3-mo. follow-up = 1, 6-mo. follow-up = 2, etc.

Table 13. Multilevel model of fixed effects of couple type, IP sex, and couple type X IP sex interaction on alcohol use during follow-up

Parameter	β	S.E.	p
Intercept	1.19	0.21	<.001
Baseline ACQ	0.00	0.00	ns
Baseline PDA	0.34	0.09	<.001
Original Study	-0.12	0.03	0.001
Couple Type	0.06	0.07	ns
IP Gender	0.03	0.11	ns
Couple Type*IP Gender	-0.05	0.04	ns

ACQ = Areas of Change Questionnaire, PDA = percent days abstinent. Time was coded so that 3-mo. follow-up = 1, 6-mo. follow-up = 2, etc. IP sex was coded as that male = 1, female = 2.