

ABSTRACT

Title of Document: DUI: TREATMENT COMPLIANCE,
RETENTION, AND MOTIVATION FOR
TREATMENT.

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Alcohol abuse and its treatment have been an increasing focus of legal, social, and treatment research during recent decades. Motivational Interviewing (MI) is one treatment approach that has received considerable attention and increasing empirical support for treating individuals with alcohol use problems. DUI offenders represent a subgroup of the alcohol-abusing population who appear to face unique issues related to “coerced treatment”, low motivation for change, and a major treatment focus on decreasing recidivism. Success in treating this population been mixed. Given their unique treatment issues, DUI offenders may particularly benefit from MI’s focus on increasing motivation for change. However, only preliminary research examining the impact of MI on DUI offenders currently exists.

The purpose of this study was to examine the factors that affect treatment participation, treatment engagement, and drinking behaviors by implementing a MI intervention with DUI offenders mandated to enroll in an outpatient treatment program. This study was the first to consider recidivist status and examine the efficacy of MI with

DUI offenders with a reasonable sample size ($N = 98$). A brief MI intervention was randomly administered to 48 of the DUI offenders enrolling in outpatient treatment and data was collected at baseline and 3-month follow-up. Results of primary analyses revealed that only one outcome, *self-confidence*, was significantly affected by any predictor variables (i.e., treatment group, recidivist status, and motivation for treatment). Secondary analyses were conducted with two revised models. Offender *compliance* (i.e., number of positive urine tests) was predicted by recidivist status when the additional predictor variable of drug co-morbidity was included in the model. The second revised model limited the sample size to 54 “recent” offenders (i.e., entered treatment within 180 days of their most recent DUI offense) and revealed several additional significant findings.

Although few significant findings were found relating to the impact of MI, results of this study nevertheless suggest that further examination of MI for treatment with DUI offenders is warranted. Moreover, the offender’s recidivist status and the amount of time lapse since offense appear to be important clinical and empirical considerations for this population. Study limitations and future directions are discussed.

DUI: TREATMENT COMPLIANCE, RETENTION, AND MOTIVATION FOR
TREATMENT.

By

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Dissertation submitted to the Faculty of the Graduate School of the
University of Maryland, College Park, in partial fulfillment
of the requirements for the degree of
Doctor of Philosophy
2006

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Dedication

To Erin, the love of my life. Your patience and support through the years (and through this project) have inspired me to become a better person, while teaching me the most important lessons in life. My accomplishments are yours. Thank you for being right there beside me through this.

Acknowledgements

I would be remiss to not mention my gratitude for the following individuals and their support during my dissertation “years”:

Kevin O’Grady – for his patience and collaboration on this project

Robert Brown – for all his help getting me started on my graduate career

The clinical psychology faculty – for their mentoring and support

My wife and children – for their patience during all the evenings that “daddy” was gone to Baltimore . . .

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CHAPTER 1: INTRODUCTION

The costs of substance abuse to our society are both astonishing and largely underestimated (Harwood, Fountain & Livermore, 1998; Foster & Modi, 2000). For several decades, mental health professionals have mobilized and intervened on multiple levels to help individuals suffering from substance abuse problems, as well as the loved ones and members of society who suffer directly and indirectly from their behaviors. Substance abuse drains individual, familial, and social network, as well as community, resources. Evidence of the far-reaching effects is witnessed in child welfare settings, family agencies, mental health agencies, the health care field, the world of work, the school systems, and in our communities, in general.

The Problem of Alcohol Abuse

It has become clear that alcohol abuse, as a major contributor to the substance abuse problem, is a major public health concern in the United States and is largely under-reported by health care professionals (US Department of Health and Human Services, 1997). Major reports (e.g., National Clearinghouse for Alcohol and Drug Information, 1995) outlining the immense impact of alcohol abuse on our society suggest that such abuse has been implicated as a factor in many of our country's most serious problems, "including violence, injury, child and spousal abuse, HIV/AIDS and other sexually transmitted diseases, teen pregnancy, school failure, car crashes, escalating health care costs, low worker productivity, and homelessness" (p. 1).

It has been estimated that the annual social cost of alcohol abuse is \$148 billion (Cook & Moore, 1998). It was estimated, during a three-year period in the 1990s, that

there were more than 600,000 alcohol-abuse-related clinic admissions per year (Substance Abuse and Mental Health Services Offices of Applied Statistics, 1997). Moreover, a high percentage of suicides (36-40%) appear to be associated with alcohol consumption (Hawton et al., 1991; USDHHS, 1997, p. 259). Finally, there is a large body of literature that link alcohol consumption with violent crimes, including murder (Peranan, 1991; Parker & Rebhun, 1995), rape (Collins & Messerschmidt, 1993), assault (Peranan, 1991), and domestic violence (Fagan, 1993; Leonard, 1993; Kantor, 1993). It is also associated with apparently minor conflicts leading to more severe crimes (Fagan, 1993; Peranan, 1991, 1993).

Even a decade ago there were more than 120,000 deaths annually related to excessive alcohol consumption (McGinnis, 1993) and that number appears to steadily increasing (USDHHS, 1997, p.247). Alcohol is involved in almost 45% of the 45,000 automobile accident deaths each year, while an additional 289,000 individuals are injured in such alcohol-related accidents (USDHHS, 1997, p.11). The cost of all alcohol-related automobile crashes is estimated to be \$45 billion a year (USDHHS, 2000). There is little doubt that the widespread abuse of alcohol negatively impacts our society in costly and destructive ways.

Etiology and Treatment of Alcohol Abuse

There exist numerous theoretical and practical approaches to understanding the etiology of and treatment for alcohol abuse in the United States (Miller & Hester, 1995), leading to continuing confusion about how alcohol problems should be treated. The integration of these various conceptual models has been slow in coming, although it is generally agreed upon, and supported by the empirical literature, that no single model is

likely to be adequate in guiding efforts to intervene with and prevent all alcohol problems. With a number of myths (e.g., nothing works, all approaches are the same, etc.) concerning treatment of alcohol abuse having been dispelled by recent research, there is now a relatively large body of treatment research that indicates there are, in fact, distinct approaches and interventions which are significantly better than no intervention or alternative treatments.

Various interpretations of the outcome research related to the treatment of alcohol abuse have led to a research focus on finding common core ingredients to alcohol programs that evoke change and are associated with positive outcomes. Based on the analysis of these core ingredients, it is apparent that the underlying characteristic of all these components, whether taken individually or as a whole, is a goal of fostering increases in the individual's motivation for change. While the most commonly implemented approaches in the treatment of alcohol abuse (i.e., 12-Step Facilitation Approach, Cognitive-Behavioral Coping Skills Therapy, Aversion Therapies, Relapse Prevention Strategies, Marital and Family Approaches) may differ in their core models and conceptualizations of the issues, one major theme has been increasingly considered an important factor in the treatment of addictive behaviors: motivation for change (Miller, 1985). Described as a prerequisite necessary for any significant progress in substance abuse treatment (Beckman, 1980), motivation for change, or the lack thereof, is often used to explain the failure of individuals to enter into, continue in, comply with, and succeed in treatment (Miller, 1985). Consequently, treatment interventions which target the enhancement of motivation for change have become increasingly of interest to researchers and clinicians alike.

Motivational Interviewing

The Motivational Interviewing (MI) intervention was developed and designed to produce rapid, internally motivated change by mobilizing the client's personal change-related resources (Miller, 1983). Based upon Prochaska and DiClemente's (1992) stages of change model – which posits a sequence of stages through which individuals progress in the modification of addictive behaviors – MI helps the client to consider how much of a problem their drinking behaviors pose, to assess the possibility and the costs/benefits of changing the problem behaviors, to reach a determination or decision to make a change, and to resolve to overcome unsuccessful past attempts and push through the cycle of change (Prochaska & DiClemente, 1992). The therapist's major efforts are to create an environment that will facilitate the client's own motivation for and commitment to change, which must be intrinsic in order to have a lasting and positive impact on their efforts (Miller, 1983).

MI, although sometimes implemented in conjunction with other treatment strategies and approaches, is, in its own right, an effective outpatient treatment strategy (Miller & Rollnick, 2002). Treatment outcome research and clinical trials strongly supports MI strategies as effective in producing change in the alcohol abusers and problem drinkers (Allsop, Saunders, Phillips, & Carr, 1997; Miller, Benefield, & Tonigan, 1993; Miller, Sovereign, & Krege, 1988; Sellman, Sullivan, Dore, Adamson, & MacEwan, 2001). For example, the results of the Project MATCH Research Group (1997, 1998a, 1988b) studies established a great deal of credibility for the efficacy of MI, finding 4 sessions of Motivational Enhancement Therapy (a structured format of MI) to

be equally effective as cognitive-behavioral therapy and 12-step facilitation in maintaining abstinence in problem drinkers at 3-year follow-up.

In addition to alcohol-abusing populations, MI has been found to be associated with similarly successful treatment outcomes in other populations, including heterogeneous groups of drug abusers (Lincourt, Kuettal, & Bombardier, 2002; Longshore, Grills, & Annon, 1999; Saunders, Wilkinson, & Phillips, 1995; Schneider, Casey, & Kohn, 2000), amphetamine abusers (Baker, Boggs, & Lewin, 2001), marijuana users (Stephens, Roffman, & Curtin, 2000), cocaine abusers (Stotts, Schmitz, Rhoades, & Grabowski, 2001), and smokers (Colby et al., 1998). Clinical trials have found that MI is associated with positive gains on measures of cardiovascular health (Wollard et al., 1995) and in improving adherence to treatment programs with women who suffer from diabetes (Smith, Heckemeyer, Kratt, & Mason, 1997). Finally, MI has also been demonstrated to be associated with successful treatment outcomes when working with psychiatric inpatients (Kemp, Kirov, Everitt, Hayward, & David, 1998; Swanson, Pantaloni, & Cohen, 1999), individuals who suffer from bulimia (Treasure et al., 1999), chronic gamblers (Hodgins, Currie, & el-Guebaly, 2001), and individuals at risk for HIV (Carey et al., 1997). The overall effectiveness of MI compares favorably with outcomes of alternative treatments, and when cost-effectiveness is considered, indeed appears to fair relatively well in comparison to other treatment approaches (Holder, Longbaugh, Miller, & Rubonis, 1991).

The Driving Under the Influence (DUI) Offender

Some research indicates that hazardous use of alcohol by “problem drinkers” is accountable for more social costs of alcohol misuse than the damage incurred by those

with more severe alcohol disorder (Yalisove, 2004). A major part of this impact is accounted for by “problem drinkers” who choose to drink and drive. However, only a small percentage of drinkers are ever apprehended (estimated to be only 1% of all infractions; Yalisove, 2004).

This category of lawbreakers includes those who have been charged with either a Driving While Intoxicated (DWI) or Driving Under the Influence (DUI) violation. The technical difference between DUI and DWI offenses vary by state and also between state and federal laws. In most cases, the terms are used interchangeably and simply refer to “drunk driving”. However, for the federal government the distinction between the two is drawn based on severity, where a DWI is issued when blood alcohol content (BAC) is over the 0.08 limit, and a DUI refers to a less severe offense (i.e., BAC is under 0.08). [Note: from this point forward, all drunk-driving offenders will be referred to as DUI offenders for the sake of simplicity.]

The DUI offender group represents a distinctive sub-sample of the alcohol-abusing population (Caviola & Wuth, 2002); a group with unique histories and treatment issues because the nature of the offense. For example, the primary legal objective in treating the DUI offender is to reduce, and ultimately eliminate, future offenses. Oftentimes, however, this objective is not the therapeutic goal of the mental health professional who works directly with the offender. Yet the legal sanction issues have a major impact on the focus of the treatment interventions and, subsequently, the offender’s motivation for treatment and change (Ross, 1984; Weisner, 1990).

During the 1980s and 1990s, legislative changes, increased law enforcement, highly visible advocacy, public education, and tougher prosecution and punishment were

all components of the "war on drunk driving." Many credit this combination of interventions with the reductions in drunk driving witnessed during those decades. Efforts to reduce impaired driving have ranged from environmental approaches targeting alcohol availability, sales, and service within a community, such as ordinances that limit the number of alcohol outlets in an area, to approaches targeting individual driving behavior, such as the designated driver public awareness campaign.

Overall, treatment of the DUI population has offered mixed outcome results. However, some researchers and clinicians remain optimistic about intervention, based on anecdotal and limited empirical evidence (Bloomberg, Preusser, & Ulmer, 1987; Klein, 1989; Nichols & Ross, 1989; Sadler & Perrine, 1984; Tashima & Peck, 1986; Wells-Parker, 1994). Despite the optimism, recidivism rates for this population remain unacceptably high, even for those offenders who have completed intensive treatment programs, and the need for clinical research in the treatment of problem drinkers, including DUI offenders, is great. The factors related to success in the treatment of DUI offenders are complex in nature but the primary issue to address should be, what is often referred to as, "coerced treatment". Removing some of the voluntary nature of their participation in treatment appears to have a direct effect on their motivation to change, leading to resistance to treatment interventions, and, consequently, high recidivism rates (Ginsburg, Mann, Rotgers, & Weekes, 2002).

MI and the DUI Offender

Theoretically, MI represents a therapeutic tool that potentially targets or addresses many of the treatment issues specific to working with DUI offenders. The basis for implementing and evaluating a MI intervention with this population is built on the

empirical and theoretical foundation of such motivational techniques with similar alcohol-abusing populations. Although there may be some procedural adjustments to administering MI to this population (e.g., focus on the perceived coercive nature of enrollment in treatment), the basic principles remain the same: eliciting client concerns, reflecting ambivalence, and allowing the client to develop a plan for change that best suits him or her (Ginsburg et al., 2002). Thus, MI attempts to restore some of the offender's control over a treatment process that is perceived to be lost through the coercive aspect of treatment.

MI has previously demonstrated significant benefits in treating alcohol abuse in similar populations, including increasing the percentage of patients who remain abstinent (Allsop et al., 1997; Project MATCH Research Group, 1997; Handmaker et al., 1999), increasing the number of days to next relapse or drink (Allsop et al., 1997; Bien, Miller & Boroughs, 1993), and decreasing the number of drinks per week or month (Bien et al., 1993; Borsari & Carey, 2000; Brown & Miller, 1993; Heather et al., 1996; Marlatt et al., 1998; Miller et al., 1993; Murphy, Duchnick, Vuchinich, Davison, Karg & Olson, 2001; Sellman et al., 2001; Senft et al., 1997). However, despite the considerable empirical evidence supporting the effectiveness of MI with various populations (Miller, 1996), such motivational enhancement techniques have rarely been examined in the context of outpatient treatment programs for DUI offenders. To date, there have only been four studies conducted (Ferguson, 1998; Nochajski & Stasiewicz, 2002; Nochajski, Stasiewicz, & Gonzalez, 2000; Stein & Lebeau-Craven, 2002) that have examined the possible impact of employing MI in the treatment of this population and, in the case of three, the sample sizes have been relatively small.

In a small-scale controlled study, Ferguson (1998) reported null findings after implementing MI with treatment-mandated DUI offenders. This was the only study to find that there were no significant differences, at follow-up, between the intervention and control groups in levels of alcohol consumption. Nochajski and colleagues (2000) collected data on 25 DUI offenders and found that MI (modified to focus on harm reduction strategies) was linked to reduced recidivism rates and better treatment retention, suggesting that MI can, in fact, be effective with this population. Stein and Lebeau-Craven (2002) demonstrated, in a pilot study with 25 DUI offenders, that MI (combined with relapse prevention strategies) improved offenders' coping skills, as well as treatment satisfaction and retention. Finally, Nochajski and Stasiewicz (2002) conducted a larger scale clinical trial ($N=62$) with DUI offenders mandated to receive an alcohol abuse assessment and compared the effects of a single session of MI to that of a single control session (described as education on the effects of alcohol advertising). The results of the trial suggested that the MI intervention was associated with reductions in general drinking, as well as drinking-driving, behaviors.

In light of the results of these few studies, the literature on DUI still tells us very little about the direct relationship between MI interventions and the treatment compliance and retention of DUI offenders, particularly repeat offenders. But these studies do suggest that more well-controlled, and larger, clinical trials are warranted to study the effectiveness of MI in treating this population.

Direction of the Present Study

Perspectives on and theories about the etiology of alcohol abuse have evolved greatly as our empirical, physiological, and socio-cultural understanding of alcohol, and

its effects, has improved. The issues surrounding etiology, treatment, and public policy are being investigated on a variety of levels, involving politicians, medical researchers, social scientists, and mental health professionals. Unfortunately, addictive disorders are complex and cannot be reduced to simplistic theories based on biological or psychosocial factors alone. It is only by integrating our understanding from the various perspectives and theories about the etiology and treatment of alcohol abuse that we will truly headway into addressing the widespread concerns associated with the problem. A growing body of research continually contributes to this understanding and the current study contributes an important piece in the puzzle that remains largely incomplete.

In this vein, the objectives of this study were to better understand the factors that affect treatment participation, treatment engagement, and drinking behavior of DUI offenders in community-based substance abuse treatment programs – and whether it is possible to positively impact these factors among both initial and repeat DUI offenders. Recruiting 98 DUI offenders, who were enrolled in outpatient treatment for substance abuse, we examined how treatment participation, treatment engagement, and drinking behavior were impacted by the addition of a brief motivational intervention (i.e., MI) component, as a supplement to the typical outpatient group treatment interventions. Moreover, the role that initial motivation for treatment played in the responsiveness to group treatment, both with and without the addition of a motivational interviewing component, was examined. Consequently, the results of this study will inform both researchers and treatment program developers about the important relationship treatment motivation may have with decreased recidivism rates and improved treatment outcomes with DUI offenders.

CHAPTER 2: LITERATURE REVIEW

A greater understanding of alcohol abuse has evolved over the past several decades as its widespread abuse and concomitant effects on our society have taken a spotlight on the stage of major public health problems. From the initial conceptualizations of Benjamin Rush in 1795, labeling the excessive use of distilled liquor as a disease, the disease model has maintained dominance in mainstream thought surrounding perspectives on alcohol abuse. Consequently, numerous movements were organized over the past two centuries to impose duties on liquor, promote temperance education, and prohibit the sale of alcohol beverages. One important culmination of these efforts came in 1939 with the formation of Alcoholics Anonymous, a successful and widespread support that actively promotes sobriety. However, as our culture has evolved in recent decades, so have our perceptions, experiences, expressions, help-seeking behaviors, and treatments of alcohol abuse.

To a degree, US communities largely remain tolerant of alcohol abuse, only labeling abuse behaviors as abnormal once they become self-destructive and severely dysfunctional for the individual and/or family. Consequently, mental health professionals have made efforts to formalize diagnostic criteria (e.g., DSM-IV-TR) in order to interpret and diagnose the illness behavior of individuals abusing substances. But only in the cases of major offenses toward society (i.e., drunk-driving offenses) does society become proscriptive regarding the necessity for treatment and punishment. Nonetheless, millions of individuals with alcohol abuse problems are treated each year, representing an extremely heterogeneous population in terms of their drinking behaviors, motives for

abuse, level of dependence, desire for help and treatment reasons for seeking help, and diagnosable co-morbid disorders.

A number of different terms have been used interchangeably when referring to alcohol abuse, including alcohol-related disorders, alcohol dependence, addiction, and alcoholism. In the context of this study proposal, the term *alcohol abuse* will be used throughout this study to refer to all of these alcohol-related conditions. Therefore, it encompasses *alcohol dependence*, a more severe form of abuse characterized by a habitual use of alcohol that is taken more frequently in larger amounts, leading to increasingly negative consequences. Terms such as *alcoholism*, *addiction*, and *alcohol-related disorder* can be viewed simply as conditions related to *alcohol dependence*.

Etiology of Alcohol Abuse

There exist a myriad of theoretical and models concerning the nature and etiology of alcohol abuse in the United States (Hester & Sheeby, 1990; Miller & Hester, 1995). Ranging from models that focus on biochemical abnormalities (Milam & Ketcham, 1981) or personal choice (Fingarette, 1988), to those that emphasize social learning process (Peele, 1985), family dynamics (Steiner, 1971), or sociocultural influences (Calahan, 1987), disagreements about which conceptualizations are most appropriate or superior in working with alcohol abuse, and consequently problem drinkers, abound. As a result, the debates around this issue have contributed to continuing confusion about how alcohol problems should be treated (Hester & Sheeby, 1990).

Moral and Temperance Models. Moral theories view alcohol problems as willful violations of societal rules and norms. These models have traditionally emphasized deficits in personal responsibility or spiritual strength as the cause of

excessive drinking. The evidence that this model continues to impact our policy toward alcohol can be seen in the fact that while the majority of criminal acts are committed under the influence of alcohol and drugs, intoxication is rarely a justifiable defense in the courts.

The temperance model, which initially emerged in the 1800s, posits alcohol as a hazardous substance, encouraging moderate and cautious use. As the temperance movement became increasingly popular and wielded more political influence, its views of alcohol became more extreme, resulting in Congress passing the 18th amendment to the Constitution, which began the era of Prohibition. The temperance movement died with the repeal of Prohibition in 1933, but the key assumptions have survived, influencing our thinking about alcohol today. In fact, it is likely that if alcohol were only now being introduced in our society, it is doubtful that it would even be legalized, given our current knowledge of its devastating health and social consequences (NIAAA, 1994). These moral theories in practice and intervention are observed in exhortation for temperance or abstinence, as well as efforts to control the costs, availability, and promotion of alcohol to the general public.

The American Disease Model. After the temperance model fell from prominence, Alcoholics Anonymous (AA) soon after emerged and with it the American disease model. The central assumption of this model is that alcoholism is a progressive, irreversible condition characterized primarily by loss of control over drinking. In essence, it cannot be cured, only arrested by complete abstinence. The AA approach to the treatment of alcohol abuse, in practice, centers around 12 steps which provide guidelines for achieving a sober life (Miller & Kurtz, 1994). From this perspective,

alcohol abuse is understood to be a condition that individuals are powerless to overcome on their own. Thus, it becomes necessary to turn over one's life to a higher power, following a spiritual path to recovery.

Characterological Models. Other theories characterize alcohol abuse as a dispositional disease, which emphasizes constitutional differences between alcoholics and other people, or as being rooted in the abnormalities of personality (Moyers & Miller, 1993). This conceptualization was rooted initially in psychoanalysis and suggested that alcoholics were fixated at some stage of personality development. In practice, such approaches focus on abstinence as the only means of arresting the progress of the illness or total personality restructuring.

Biological Models. Related to these dispositional models, biological models (e.g., Milam & Ketcham, 1981) place strong emphasis on genetic heredity and brain physiological processes as determinants of alcohol abuse. This model is supported by evidence of higher levels of alcoholism among offspring of alcoholics, even if not raised by their biological parents. The implications for intervention from this perspective vary greatly from risk identification and genetic counseling (for those who are at risk) to medical treatments.

Behavioral Models. Behavioral models postulate that learning and conditioning processes explain how alcohol problems develop. A array of behavioral treatment strategies that focus on re-learning behavior, aversion therapies, community reinforcement approaches and contingencies are now employed in a wide variety of treatment settings. More complex social learning models point to the interaction between individuals and their environment in shaping patterns of alcohol use, leading to treatment

strategies that stress coping skills and altering the client's relationship with the environment. Because expectancies and beliefs about the effects of substances use have been found to increasingly important (Brown, 1993), cognitive models have contributed additional strategies of relapse prevention, coping with cravings, and modification of beliefs that promote problematic use of alcohol (Beck, Wright, Newman, & Liese, 1993).

Social Learning and Educational Models. Emphasizing the social context in which heavy drinking occurs, social learning theories posit that the causal factors include deficits in coping skills, peer pressures, modeling of heavy drinking, positive expectancies about drinking, and psychological dependence are important determinants of alcohol abuse. Educational models assume that alcohol abuse stems from deficits in knowledge about the harmful effects of alcohol and heavy or hazardous drinking. Consequently, in both of these models the appropriate agents of intervention include psychoeducation, cognitive-behavioral therapies and role models.

Socio-cultural and Systems Models. On a much broader level, sociocultural and systems models posit that environmental factors, cultural norms, boundaries and rules in relationships, and family dysfunction all contribute significantly to alcohol problems. Most of the social system is the family, indicating that dysfunctional family can be the major causal factor in alcohol abuse. However, the role of societal norms about drinking, the cost and availability of alcohol, and the nature of the drinking environment itself are important factors to consider. Family therapy interventions are the recommended approach for addressing the specific environmental system of each client, while social policy, including price and distribution controls, represent interventions that would impact all or, at least, a large segment of society.

The integration of these various conceptual models has been slow in coming, as the developmental history of approaches to the treatment of alcohol problems is largely a history of contention rather than cooperation among the models described above. Although the theoretical and practical implications of these models differ greatly, it is generally agreed upon and supported by the empirical literature that no one of them is likely to be adequate in guiding efforts to intervene with and prevent alcohol problems. However, a public health model (Hester & Sheeby, 1990; Miller & Hester, 1989, 1995), being espoused by an increasing number of public health professionals, considers causal factors from many of the seemingly incompatible perspectives and offers hope for integration of the various explanations for the more effective treatment of alcohol problems. This model is more comprehensive than any single model discussed previously and emphasizes multiple aspects or levels of the problem, without excluding others. Consequently, the primary and secondary prevention efforts implied by an integrative model are multidimensional and broad spectrum (Hester & Sheeby, 1990). Ultimately, there is a clear relationship between assimilating various theoretical models and more effective treatment strategies, and interventions have been guided by a single model all too often. Alcohol problems and the people who face them are diverse, requiring approaches that offer effective alternatives and treatment components incorporated from a variety of models.

Major Treatment Approaches to Alcohol Abuse

12-Step Facilitation Approach. Grounded in the perspective that alcohol abuse is a spiritual and medical disease, the underlying content of the 12-step facilitation approach is consistent with the 12 Steps of Alcoholics Anonymous (Nowinski, Baker, &

Carroll, 1995). This approach assumes that alcohol abuse is a progressive illness that affects the body, mind, and spirit, and that the only effective remedy is abstinence from alcohol. The overall objective is to have the individual maintain active involvement and participation in the fellowship of AA, which is presumed to be the primary factor in responsible for maintaining sobriety or recovery. AA itself is not a treatment method but a fellowship of peers, united by their common addiction. The 12-step facilitation approach is structured program that outlines the goals and methods for achieving the more specific objectives (e.g., cognitive, emotional, behavioral, social, spiritual) of the intervention.

When this program was manualized for the Project MATCH study (Nowinski et al., 1995), the primary focus was on first 5 steps of the AA process, including acceptance, surrender and getting active, as well as fostering firm client commitment to participation in the program. The protocol delineates that patients actively attend AA meetings, maintain a detailed journal, and attend 12 highly structured, individual sessions. The individual sessions are used as a tool to review symptomology, reinforce participation in the program, introduce and explain the weekly theme, and set new goals.

Cognitive-Behavioral Coping Skills Therapy. Based on principles of social learning theory, the general cognitive-behavioral treatment approach conceptualizes drinking behavior as functionally related to major problems in a person's life. Thus, addressing a broad spectrum of problems will prove more effective in the treatment of alcohol abuse than focusing on the drinking alone. Behavioral techniques are implemented to help the individual overcome skill deficits and increase their ability to cope effectively with high-risk situations that typically precipitate relapse, as well as

provide a means of obtaining social support that is deemed critical to the maintenance of sobriety. The eliciting situations usually include interpersonal difficulties and intrapersonal discomfort, including anxiety and depression.

Many specific coping and social skills programs have been developed to target substance abuse problems (Marlatt & Gordon, 1985; Monti, Abrams, Kadden, & Cooney, 1989). For example, in a 12-session format that was manualized for evaluation in a major outcome research study (Kadden et al., 1999), clients are trained to use active behavioral and cognitive coping methods to deal with problems, rather than relying on alcohol as a maladaptive coping strategy. The primary goal of treatment is to help the client master skills that will help to maintain abstinence from alcohol and other drugs. High-risk situations for relapse are identified (including both internal and external precipitants) and basic skill elements for dealing with these common problem areas are taught. The clients engage in problem solving, role playing (Monti et al., 1989), and homework practice exercises that should enable them to apply their new skills and meet their own particular needs.

Drinking often serves as coping mechanism for stress and anxiety in the drinker's life (Stockwell, 1995). Because drinkers may be consuming large amounts of alcohol to gain some control over their stress reactions (i.e., anxiety, fear, anger, depression), interventions that help the drinker "manage" the stress are frequently helpful. Common cognitive-behavioral methods help a person to modify a tendency toward depressed mood states and reduce social anxiety by training assertiveness and other social skills. Such methods often include monitoring anxiety during withdrawal, removal of alcohol-related cues, reduction of social and environmental stressors, reducing cognitive conflicts about

whether to drink or not, preventing faulty cognitive attributions, avoiding stimulants, and relaxation training.

Aversion Therapies. Aversion therapies are designed to diminish or eradicate an individual's desire for alcohol (Rimmele, Howard, & Hilfrink, 1995). A variety of treatment methods can be employed with alcohol-abusers in an effort to pair unpleasant stimuli (such as images) with alcohol consumption. By condition a negative response to those cues associated with drinking (e.g., taste, smell, sight), the client's level of alcohol consumption should dramatically decrease. The most common strategies are nausea, electric shock, imagery, and apnea, and because of the unpleasant and sometimes painful nature of the stimuli, appropriate supervision of the client is often required and client dropout rates are high.

Relapse Prevention Strategies. Relapse prevention focuses on the most common treatment outcome for alcoholics: relapse. The importance of maintaining positive changes initiated by treatment has become increasingly evident as Marlatt and Gordon (1985) first described relapse prevention as a cognitive-behavioral self-management program designed to address this "revolving door" phenomenon. Combining behavioral skills procedures with cognitive techniques (Craighead, Craighead, Kazdin, & Mahoney, 1994), relapse prevention focuses on three distinct treatment issues: anticipating and preventing relapses, coping effectively with relapse, and reducing health risks and adjusting lifestyle imbalances. This treatment approach has been implemented in conjunction with a variety of other strategies (Dimeoff & Marlatt, 1995) and has been found to work well as the main treatment in group settings (Wanigaratne, Wallace, Pullin, Kearney, & Farmer, 1990).

Marital and Family Approaches. Marital and family therapy (MFT) approaches have been increasingly employed to facilitate other substance abuse treatment modalities. A growing body of clinical and research evidence supports the theories of an interdependent relationship between marital-family interactions and abusive drinking. It is widely accepted that many alcoholics have extensive marital and family problems (e.g., O'Farrell & Birchler, 1987) and that positive marital and family adjustment is associated with better alcohol abuse treatment outcomes at follow-up (e.g., Moos, Finney, & Cronkite, 1990) and vice versa (i.e., marital and family conflict may often precipitate relapse of drinking behaviors; see Maisto, O'Farrell, Connors, McKay, & Pelcovits, 1988). These MFT interventions are implemented at all stages of the recovery process (O'Farrell, 1995) and may achieve a number of different goals to assist the client's process of change. Family members may be taught how to help the client initiate the change process and overcome resistance to treatment. MFT strategies may then try to stabilize short-term change in the alcohol problems and in the alcoholic's marriage and family relationships through altering relationship interaction patterns and creating an atmosphere that is more conducive to sobriety.

Outcome Research in Alcohol Abuse

A large body of treatment outcome research indicates that there are, in fact, a number of diverse approaches and interventions that are significantly better than no intervention or alternative treatments (Armor et al., 1987; Miller et al., 2001; Moos et al., 1999; Project MATCH Research Group, 1997; Timko et al., 1995, 2000). No single approach appears superior in terms of treatment effectiveness. Neither are all treatments equally effective (or ineffective). Consequently, there is reason for hope and optimism in

the field of alcohol abuse treatment, because an array of promising and effective alternatives exist, each of which may be most effective for different types of individuals or populations (as will be discussed later in this review).

Recent research on the treatment of alcohol abuse appears to point to surprisingly few differences in outcome between longer, more intensive alcohol treatment programs and shorter, less intensive, and even relatively brief, alternative approaches (Annis, 1985; Miller & Hester, 1986; Miller & Rollnick, 1991). Although some pessimistic interpretations might suggest that all alcohol treatments are equally ineffective, a larger review of the literature reveals significant differences among alcohol treatment approaches in close to half of clinical trials (Miller et al., 1999). Additionally, numerous studies have demonstrated that the lack of an intervention is less effective than relatively brief treatment strategies (Bien, Miller, & Tonigan, 1992; Holder et al., 1991).

A Core Ingredient for Success: Motivation for Change

Various interpretations of the outcome research related to the treatment of alcohol abuse have led to a research focus on finding common core ingredients to alcohol programs that evoke change and are associated with positive outcomes. It has been argued that more extensive treatment interventions often include components unnecessary to achieving treatment success, and that therapeutic strategies need only include the critical strategies that are sufficient to induce change (Orford, 1986).

In a more in-depth commentary on the common elements of the relatively brief interventions that have been shown by research to induce change in problem drinkers, Miller and Sanchez (2000) outlined six “active” ingredients that appear to at least be

theoretically linked to change. They summarized the essence of these elements by the acronym FRAMES, which stands for:

- FEEDBACK of personal risk or impairment
- Emphasis on personal RESPONSIBILITY for change
- Clear ADVICE to change
- A MENU of alternative change options
- Therapist EMPATHY
- Facilitation of client SELF-EFFICACY or optimism

The underlying characteristic of all these components, whether taken individually or as a whole, is a goal of fostering increases in the individual's motivation to change (Sanchez, 2000). Whether the intervention is administered by psychologists, physicians, social workers, or clergy, the one point on which they all seem to agree, despite the wide differences in how alcohol problems are viewed, is that client motivation for treatment and change is a key issue to recovery. Therapeutic interventions containing some or all of these motivational elements have been demonstrated to be effective in initiating treatment and in reducing long-term alcohol use, alcohol-related problems, and health consequences of drinking (Bien et al., 1992).

For over two decades now, motivation for change has been considered an important factor in the treatment of addictive behaviors such as substance abuse (Karoly, 1980; Miller, 1985). Some mental health professionals have described it as a prerequisite necessary for any significant progress in substance abuse treatment (Beckham, 1980). Moreover, a lack of proper motivation for change is often used to explain the failure of individuals to enter, continue in, comply with, and succeed in treatment (Miller, 1985).

Various views on the underlying nature and malleability of motivation for change in substance abuse clients have been put forth, attributing it to client characteristics (i.e., personality traits), resistance, and overuse of defense mechanism such as denial (Miller, 1985). In stage theories of motivation (e.g., see Prochaska & DiClemente, 1992), which suggest that motivation for treatment is multi-dimensional, the client's characteristics, such as recognition of the alcohol-related problems and a desire for help, are considered motivational issues in the process of change (DeLeon, 1984; Simpson & Sells, 1982). Thus, an individual's perceived need for any treatment assistance in personal change represents a distinct level in the process of change than if they were feeling motivated to change but did not see the necessity of treatment (DeLeon & Jainchill, 1986).

An established body of research has demonstrated that the recognition and perception of the severity of substance abuse problems is directly related to tenure in treatment (DeLeon & Jainchill, 1986; Simpson, 1984; Simpson & Joe, 1993). Individuals who suffer from substance abuse problems and do not view their addictions as problematic or severe in nature, do not remain long in treatment. Consequently, treatment success is adversely affected by low motivation for change.

Motivational Interviewing (MI)

Motivational Interviewing (MI) is a semi-structured intervention; an approach based on principles of motivational psychology. It is designed to produce rapid, internally motivated change by mobilizing the client's own change-related resources. According to Miller and Sanchez (1994), the core elements of MI can best be conceptualized in terms of the FRAMES criteria: 1) systematic assessment and *Feedback* of individual findings; 2) the client's personal *Responsibility* and free choice for change;

3) direct *Advice* to make a change; 4) a *Menu* of different ways in which change could be accomplished; 5) therapist *Empathy*; and 6) strengthening the client's *Self-Efficacy* for change, reinforcing optimism in one's ability to succeed.

Moreover, consideration of the six separate stages in natural recovery identified in Prochaska and DiClemente's (1992) stages of change model is important in understanding how MI promotes change. Each stage requires certain tasks to be accomplished and certain processes to be used in order to achieve lasting change. From a stages-of-change perspective, the MI approach addresses where the client currently is in the cycle of change and assists the client to move through the stages toward successful sustained change. For the MI therapist, the *Contemplation* and *Preparation* stages are the most critical. The objective is to help clients seriously consider two basic issues. The first issue is how much of a problem their detrimental behaviors pose for them and how those behaviors are affecting them (both positively and negatively). Tipping the balance of these pros and cons of substance use toward change is essential for movement from *Contemplation* to *Preparation*. Second, the client in *Contemplation* assesses the possibility and the costs/benefits of changing the problem behavior. Clients consider whether they will be able to make a change and how that change will affect their lives. In the *Preparation* stage, clients develop a firm resolve to take action. That resolve is influenced by their past experiences with change attempts. Individuals who have made unsuccessful attempts to change problem behaviors in the past need encouragement to decide to go through the cycle again.

A goal of the MI therapist is to evoke from the client statements of problem perception and a need for change. The MI therapist emphasizes the client's ability to

change rather than the client's helplessness or powerlessness over drugs. Arguing with the client is carefully avoided, and the therapist's approach is reflective rather than confrontational. No direct client-skills training is included in the MI approach. Clients are not taught 'how to.' Rather, the MI strategy relies on the client's own natural change processes and resources. Instead of telling clients how to change, the MI therapist builds motivation and elicits ideas as to how change might occur. MI assumes that the key element for lasting change is a motivational shift that instigates a clear and firm decision and commitment to change. Unlike non-directive approaches, MI employs systematic strategies toward specific goals. The therapist actively seeks to reveal discrepancy – the difference between where clients are and where they want to be – and to channel this realization toward behavior change (Miller & Rollnick, 1991). As such, MI can be considered both a directive and persuasive approach.

MI is a clinical intervention developed to facilitate lasting, internally motivated change within individuals (Miller & Rollnick, 2002). The general treatment strategy is one in which the therapist employs systematic techniques that will help the client to mobilize their own resources, as opposed to guiding them through a comprehensive series of therapeutic steps to the point of recovery. By virtue of both its rationale and content, MI requires fewer therapist-facilitated sessions than some alternatives, making it particularly useful in situations where contact with the problem drinker is limited to a few or infrequent sessions.

Development of the MI Model

The MI model replaced the traditional models of motivation, which attributed problem behaviors to properties of the individual's personality with an emphasis on the

abilities of the intervention to elicit certain changes within the individual (Miller, 1983). Hence, this approach begins with the assumption that the responsibility and capability for change lies within the client. Therefore, the therapist's primary efforts are to create an environment that will facilitate the client's own motivation for and commitment to change. This motivation must be intrinsic in order to have a lasting and positive impact on the efforts to change.

MI is based on the core therapeutic style or therapist characteristic of "accurate empathy", as defined by Carl Rogers and his colleagues (Rogers, 1957, 1959). There appears to be a strong relationship between the therapists ability to implement this skill and successful outcomes for clients (Miller & Baca, 1983; Miller, Taylor, & West, 1980). For example, this characteristic has been shown to be a powerful predictor of therapeutic success with problem drinkers, even when the treatment is guided by another approach (e.g., behavioral; Miller et al., 1980; Valle, 1981).

The MI approach is also a sharp contrast to other techniques that prescribe direct confrontation when working with problem drinkers. Conceptually opposed to an empathic style, such as that found in MI, Miller and colleagues (2000) actually found that the degree to which therapists engaged in direct confrontation was predictive of continued client drinking one year after treatment.

The MI approach is further grounded in research on processes of natural recovery. Prochaska & DiClemente (1982, 1984, 1985, and 1986) have comprehensively described a trans-theoretical model of how people change addictive behaviors, with or without formal treatment. In this model, individuals move through a series of changes as they progress in modifying problem behaviors. In the six different stages, identified in the

model (Prochaska & DiClemente, 1984, 1986), individuals must accomplish certain tasks and go through certain processes before achieving change and moving onto the next stage.

A brief overview of the stage model of the process of change:

- *Precontemplation* – This is the stage where individuals who are not even considering in their problem behavior.
- *Contemplation* – This stage marks the beginning of an individual's recognition and consideration of the feasibility and costs of changing that problem behavior.
- *Determination* – At this point, individuals decide to take an action and change.
- *Action* – This stage entails the efforts to modify the problem behavior.
- *Maintenance* – In this stage, individuals have achieved sustained change after successfully negotiating the action stage.
- *Relapse* – If sustained efforts fail then the individual begins another cycle.

Although the ideal path is to continue from one stage to the next until sustained success is achieved, many problem drinkers experience several slips or relapses in their efforts to maintain their goals. However, in describing the nature of this cycle, Prochaska and DiClemente emphasized that those individuals who relapse will often go through the cycle again, beginning with contemplation, and may eventually learn to maintain change successfully after several concerted efforts.

Miller and Rollnick (1991) have suggested that the MI may be best conceptualized within the context of Prochaska and DiClemente's developmental model

for change (Prochaska & DiClemente, 1982, 1984, 1985, 1986). The MI approach helps to establish where the individual stands in the cycle of change and assists the person to move forward toward specified goals of sustained change. Intervention before the *action* stage of the process is emphasized, focusing on factors that are associated with the success of *action* and *maintenance* stage changes. Therefore, for the therapist, the *contemplation* and *determination* stages are often deemed the most critical (Miller et al., 1999).

The primary treatment objective of MI is to help the client to consider how much of a problem their detrimental behaviors pose, including how it is affecting them both positive and negatively, and to assess the possibility and the costs/benefits of changing the problem behavior. Once the client reaches a determination or decision to make a change, their resolve will undoubtedly be influenced by unsuccessful past attempts and they will need encouragement to continue pushing through the cycle. If the therapist has a clear understanding of the cycle of change, then they can better exhibit the appropriate empathy needed for change and give better direction to the intervention strategies (described below).

Taking all of the theoretical underpinnings into consideration, Miller and Rollnick (1991) described five basic motivational principles that underlie the MI approach. The following is a brief description of these principles:

The first principle is to *express empathy*. The successful therapist will communicate respect, avoid implications of superiority, blend support with knowledge, and leave the freedom of choice to the client. Much of the time in session should be spent in reflective listening (accurate empathy), rather than telling.

The second principle is to *assist in developing discrepancy*. The motivation for change occurs when individuals perceive a discrepancy between where they are and where they want to be. The MI approach seeks to enhance and focus the client's attention on such discrepancies, as they relate to problem behaviors. The amount of effort expended by therapists to accomplish this depends on the present stage of the client. Raising awareness in the pre-contemplative stage takes much more time than it would if the client were in the later contemplation stage.

The third principle is to *avoid argumentation and confrontation* so as to reduce the client's discomfort and their likelihood of developing defensive coping strategies. The therapists must constantly be aware of their tendencies to diagnose, convince, or devalue the client. If conducted properly, the client, and not the therapist, should be voicing the arguments for change (Miller & Rollnick, 1991).

Fourth, the therapist's *handling of resistance* is key to maintaining any positive momentum of the sessions. Resistance and ambivalence to change should be viewed as normal.

Finally, the therapist *needs to support the self-efficacy* of the client, or their belief that they can perform a behavior or accomplish a task. Clients can continue to move toward change if there is some hope for success, even if they are not optimistic about it.

Description of the MI Intervention

In describing the specific practical strategies of motivational counseling, the approach is typically broken down into two phases: building motivation for change and strengthening commitment to change (Miller & Rollnick, 1991). The amount of time spent in each of these phases and the exact format of each session truly depends on the

client's readiness to change, which will vary widely at the time of initial treatment.

While some clients may begin treatment with a firm desire to change and may have even begun the action stage of the process, others will be reluctant, coerced into treatment, and possibly hostile.

Building motivation for change is sometimes thought of as "tipping the motivational balance" (Janis & Mann, 1977; Miller & Sovereign, 1989; Miller et al., 1988; Miller et al., 1999). On one side of the balance there is the status quo, or continued drinking behaviors that is weighed down by fears of change and perceived benefits of drinking, while the other side represents change in behaviors. The therapist's task is to shift the balance in favor of change and there are eight key strategies described to accomplish this end (Miller & Rollnick, 1991; Miller & Rollnick, 2002; Miller et al., 1999):

- (1) *Eliciting self-motivational statements* – open-ended questions and empathic statements are employed
- (2) *Listening with empathy*
- (3) *Objective assessment* – measures of nature and severity of the alcohol-related problems are administered
- (4) *Education* – may be initiated by individual or therapist, focusing on issues such as effects of overdrinking, addiction and dependence, restructuring the label of "alcoholic", craving and loss of control, choice and control, or problems of controlled drinking.
- (5) *Summary* – therapist summarizes the information discussed in the first three phases

(6) *Transition* – eliciting the individual’s reaction, he or she must reach the point of determination for action

(7) *Negotiation of alternatives* – a plan of action is laid out, discussing a number of options

To further emphasize the qualitatively unique nature of MI approach to treatment, it is useful to consider its major differences from other treatment approaches employed with problem drinkers. For example, MI differs dramatically from the confrontational treatment strategies in which the therapist assumes primary responsibility for breaking down the client’s denial and defensive patterns (Miller & Sovereign, 1989). The confrontation approach emphasizes that the client accepts that they are an “alcoholic” and recognizes that they are dealing with a disease over which they have little control. The therapist then makes efforts to convince the client of the diagnosis and directly, sometimes in an argumentative style, confront any resistance, or denial, that they have about their condition. Conceptually the opposite of this approach, MI de-emphasizes labels and emphasizes the critical role of personal choice in the future use of alcohol. The therapist conducts an objective evaluation but focuses on eliciting the client’s own concerns and evoking from the client statements of problem perception and the need for change. Obviously, resistance is seen as an interpersonal pattern and is met with reflection rather than confrontation.

The MI approach also differs a great deal from general cognitive-behavioral strategies. Cognitive-behavioral strategies make an effort to teach the client specific coping skills and make the assumption that the client is motivated to change. More specifically, such strategies attempt to identify and modify maladaptive cognitions and

then teach specific coping and problem-solving behaviors through instruction, modeling, directed practice, and feedback. The MI approach, would, instead first build up the client's motivation to change, based on their readiness for change, and carefully explore the client's perceptions, making efforts not to label or correct them. The specific mechanisms for change would then be elicited from the client as natural problem-solving processes that are unique to the client's situation. Therefore, it is assumed that skills-training approach may be ineffective because it shifts the focus of treatment from the key element of transformation: the firm and committed decision to change (Miller & Rollnick, 1991; Syme, 1998).

Finally, the MI treatment approach should be differentiated from other non-directive approaches with which it might be confused. Unlike traditional Rogerian approaches, MI therapists employ systematic strategies that lead to specific treatment goals and do not simply follow the client's direction, wherever it may lead. Thus the MI approach is directive in efforts to create discrepancy and selectively reinforce certain points, and is not a passive technique.

Miller (1983) outlined four key principles for enhancing motivation that, when implemented effectively in the techniques of this intervention, should predict more successful outcomes with problem drinkers.

(1) De-emphasis on labeling – labeling is not essential because it is only important to identify the problems the person is having in relation to the alcohol, and what needs to be done about them.

(2) Individual responsibility – the therapist needs to treat the individual as a responsible adult who can decide for himself/herself how severe the problem is and what needs to be done about it.

(3) Internal attribution – the individual should be given responsibility for their present condition and, consequently, credit for any changes in that situation. Changes attributed in this fashion tend to be more long-lasting, help the individual overcome the tendency to accept the role of being “helpless”, and are more consistent with the scientific literature in this area (Heather & Robertson, 1981; Hodgson, Rankin, & Stockwell, 1979).

(4) Cognitive dissonance – facilitating the recognition of discrepancies between the individual’s beliefs and behaviors necessitates change in one these two areas. Altering of the individual’s beliefs usually involves either denial of the behavior or a decrease in self-esteem or self-efficacy. Alternatively, the individual may, instead, change the drinking behavior itself. The therapist makes efforts to increase the individual’s experienced dissonance and direct it at changing behavior, while increasing self-esteem and self-efficacy.

Motivational Enhancement Therapy (MET). As a part of the experimental design of the Project MATCH research, MI was adapted to fit a 12-week format for comparison to some of the previously described alcohol abuse interventions. Termed Motivational Enhancement Therapy (MET; Miller et al., 1999), four carefully structured and individualized treatment sessions were developed in a manualized format. Throughout some recent publications in the MI literature, the terms *Motivational Enhancement Therapy* and *Motivational Interviewing* are often times used

interchangeably, but MET can be designated as the motivational treatment plan that was manualized for the Project MATCH research, while MI most often refers to the general treatment approach.

Summary of the MI Outcome Research

Whether in conjunction with other treatment approaches, or as the sole therapeutic tool, outcome research and clinical trials increasingly support MI-related strategies as effective treatment interventions. The outcome research includes numerous random-assignment clinical trials, longitudinal studies, and a wide variety of patient populations. In conducting a meta-analysis of research on MI, Hettema and colleagues (2005) came to a number of important conclusions regarding the impact of MI in 72 distinct outcome studies. First, MI demonstrated robust and enduring effects when added at the beginning of treatment interventions, including treatment retention, adherence, and staff-perceived motivation. Second, like other substance abuse treatment approaches, the positive effects of MI often emerge quickly in the course of treatment. Third, the between-groups effects diminish over time (i.e, 12-months), which is also true of other interventions and likely due to the comparison groups “catching up” over time. Finally, the effects of MI are highly variable across sites and providers, suggesting that treatment process variables, and not provider characteristics, predict effectiveness with MI.

Alcohol abusers are one such population that has received considerable attention in the MI research (Allsop et al, 1997; Miller et al, 1988, 1993, 1999; Sellman et al, 2001). Allsop and his colleagues (1997) conducted a randomized clinical trial examining a problem drinker population ($N=60$), comparing a group skills training intervention to several sessions of MI and skills training together, and found significant increases in

abstinence levels and number of days to relapse for the MI group at a 6-month follow-up. In two studies comparing MI sessions to a “confrontational” sessions (both administered at intake to treatment), Miller and colleagues (1988, 1993) found modest, yet significant, reductions in problematic drinking behaviors through 18-month follow-up. When compared to nondirective reflective listening approaches (Sellman et al., 2001), it was found to significantly decrease heavy drinking episodes at 6-month follow-up. Indeed, the overall effectiveness of MI compares favorably with outcomes of alternative treatments, and when cost-effectiveness is considered, indeed appears to fare relatively well in comparison with these other approaches (Holder et al., 1991).

The results of the Project MATCH (1997, 1998a, 1998b) research established further evidence for efficacy of MI in treating alcohol abuse outpatient populations. Project MATCH investigators selected three behavioral treatments that differed markedly in philosophy and practice: 12-step facilitation therapy, cognitive-behavioral, and motivational enhancement therapy (based on motivational psychology and designed to help patients mobilize personal resources to effect change). The treatments were selected, in part, for their distinctiveness and, in part, because each had demonstrated effectiveness, the potential to reveal matching effects, and the potential to be incorporated into standard alcoholism treatment programs. The researchers recruited 1,726 patients for two parallel study arms--one with alcohol dependent patients who received outpatient therapy and one with patients who received aftercare therapy following inpatient or day hospital treatment. Overall, Project MATCH participants showed significant and sustained improvement in increased percentage of abstinent days and decreased number of drinks per drinking days, with few clinically significant outcome differences among

the three treatments in either treatment arm. Patients who participated in Project MATCH also showed decreased use of other drugs, depression, and alcohol-related problems as well as improved liver function--improvements that were maintained throughout the 12 months following treatment, the period during which most relapses typically occur. Results from these studies (i.e., Project MATCH, 1997, 1998a, 1998b) also revealed that MI was equally effective as the other established treatment approaches on most treatment outcomes examined in the research.

As mentioned previously, MI has been found to be associated with similarly successful treatment outcomes in general drug-abusing populations. Several clinical trials with drug abusers (e.g., Lincourt et al., 2002; Longshore et al., 1999; Saunders et al., 1995; Schneider et al., 2000) have found that MI-related interventions improved a variety of treatment outcomes. For example, Lincourt et al. (2002) found that a MI group program was linked to decreased diagnostic symptoms of substance abuse and increased treatment retention for 73 outpatient clients over 2-year period, when compared to clients who did not attend the MI intervention prior to enrollment.

A study targeted specifically at amphetamine abusers (Baker et al., 2001) found that 4 MI sessions significantly reduced drug use and increased abstinence for 64 outpatients when compared to an intervention of 2 sessions of therapy and a workbook. Another clinical trial studied 291 marijuana users (Stephens et al., 2000) and established that MI, when compared to waitlist and behavioral therapy conditions, significantly decreased drug use versus the waitlist and achieved positive results more quickly than the behavioral intervention. In a study with 105 cocaine dependents (Stotts et al., 2001), MI, when added to a routine detoxification program, significantly positively impacted

treatment completion and was particularly successful with patient with initial low motivation to change. Finally, MI has demonstrated some promise with assisting smokers to decrease nicotine use and remain abstinent (Colby et al, 1998; Stotts et al., 2002).

Other clinical trials offer evidence that MI contributes to positive treatment gains with a variety of medical populations. Two studies found significant increases on measures of cardiovascular health when a MI intervention component was added to medical management (Scale, 1998; Wollard et al., 1995). MI has also improved adherence to treatment programs with women who suffer from diabetes (Smith et al., 1997). MI has been linked to successful treatment outcomes when working with psychiatric inpatients (Kemp et al., 1988; Swanson et al, 1999), as well as individuals who suffer from bulimia (Treasure et al., 1999). A study looking at the treatment efforts with chronic gamblers (Hodgins et al, 2001) found that MI appears to be associated with decreased days gambling, decreased losses, and fewer clients left unimproved by interventions. MI has also been shown to be associated with improved treatment outcomes when implemented with individuals at risk for HIV (Carey et al., 1997).

The meta-analysis of research on MI (Hettema et al., 2005) found that the average number of MI sessions across 72 outcome studies was 2 (or 2.2 hours). The evidence for the efficacy of even 1-2 sessions of MI, as an added component to other effective treatment programs, has been established in a large number of clinical trials (Borasi & Carey, 2000; Brown & Miller, 1993; Marlatt et al., 1998). For example, Bien and colleagues (1993) conducted a study with 32 problem drinkers and found that the addition of a single MI session to a generic group therapy program significantly

decreased drinks per month and increased abstinence over the course of a similar time period. In two recent studies with binge-drinking and heavy drinking college students (Borasi & Carey, 2000; Marlatt et al., 1998), the addition of a single MI session during the initial assessment procedure practically eliminated binges through 3 months post-discharge from treatment and significantly reduced drinking frequency and quantities at an 18-month follow-up. This supported the results of a similar study that was run with inpatient alcoholics (Brown & Miller, 1993) which found that the single MI session at intake to treatment significantly increased abstinence at 3-month follow-up. Similar results in outcome, in evaluating an addition of a single MI session to treatment, have been documented with outpatient alcohol-dependent drinker (Dench & Bennett, 2000), pregnant drinkers (Handmaker et al., 1999), adolescents in emergency room care (Monti et al., 1999), adults in primary care (Senft et al., 1997), and adult heavy drinkers (Heather et al, 1996).

In sum, MI is well grounded in theory and research on the successful resolution of alcohol problems. It is theoretically consistent with the major stages and processes that underlie change in addictive behaviors. It draws on motivational principles that have been derived from both experimental and clinical research. A summary of alcohol treatment outcome research reveals that brief, motivational approaches of this kind are demonstrated to be effective in achieving numerous positive changes in problem behaviors, such as alcohol abuse. Exploring the relative clinical utility of this intervention with a wide variety of clinical populations, such as those individuals in mandated substance abuse treatment programs, will continue to inform us regarding the implementation and process of motivational interventions.

DUI Offenders and Their Treatment

Like alcohol abuse, drunk driving has been considered one of our society's major health problems over the past several decades (Caviola & Wuth, 2002). The relationship between automobile crashes and excessive alcohol consumption has been long recognized as a problem. In 1998, 38% of all traffic fatalities involved alcohol, and this represents one alcohol-related traffic fatality every 33 minutes (NHTSA, 1998). Linked directly to staggering economic costs, such injuries cost over \$46 billion in 1990 (NHTSA, 1994), and high levels of property damage (Robbins, 1986), the number of deaths caused by drunk drivers, with over 1.2 million in 1993 (NHTSA, 1994), is the most tragic aspect of the problem. Drunk drivers constantly threaten the lives and well-being of other drivers, passengers, and pedestrians, causing a disproportionately large percentage of injuries, property damage, and fatalities compared to other drivers. The FBI (Yalisove, 2004) reported that DUI-related arrests accounted for highest arrest rates in 1990, followed by larceny theft and drug offenses, and, in 1997, one out of 122 licensed drivers was arrested for driving under the influence of alcohol or narcotics (NHTSA, 1998).

While the effects of alcohol abuse and the issues of treating it have been increasingly recognized and addressed over the course of the past century, society's prevention and intervention efforts toward drunk driving, and its horrifying costs to society (Waller & Turkel, 1996), experienced a much more drastic change that has been built primarily on law enforcement (USDOT, 1998). Designed to produce general deterrence by persuading motorists from getting behind the wheel after drinking, legal penalties have included a range of severe fines and jail sentences for drunk driving. High

recidivism rates have traditionally been the target of community action programs, but problem of drunk driving has proven to be a stubborn issue that does not easily give way to solutions. Drinking drivers often do not respond to legal sanctions as well as they do to therapy, and continue to commit related offenses, even when facing severe consequences such as loss of license or driving privileges, significant financial costs, or imprisonment. As a result, it has become apparent that the issue of decreasing the frequency of drunk-driving offenses involves more than “convincing” problem drinkers from getting on the road.

The greatest expansion of addiction treatment services is occurring in the criminal justice sector (Margolis & Zweben, 1998), even to the diminution of treatment resources in the health care system. The DUI offender group represents a distinctive sub-sample of the alcohol-abusing population, which can be further subdivided and characterized in terms of context and offense. The DUI offender is unique in history and treatment issues because the nature of the offense centers around the problematic behaviors associated with alcohol abuse and, if not incarcerated, is often coerced into participating in treatment.

The major legal objective in treating the DUI offender is to reduce, and ultimately eliminate, future offenses. In other words, reduce rates of recidivism within the population. However, this objective is oftentimes not the primary therapeutic goal of the mental health professional who treats the offender, as many clinicians are likely to be focused on treatment goals related to simply decreasing self-destructive behaviors and improving functioning in many aspects of the offender’s life. Nonetheless, in the case of this population, the legal sanction issues have a major impact on the course and focus of

the treatment interventions (Ross, 1984; Weisner, 1990). As is the case with the general substance abuse population, a variety of interventions have aimed to address the offenders' needs (e.g., antisocial attitudes, inadequate problem-solving skills) in an effort to reduce the risk that they will re-offend (Andrews, Bonta, & Hoge, 1990).

The likelihood of recidivism has been found to be associated with the general and historical nature of the offenders drinking patterns. DUI offenders can be, and are, commonly categorized into one of two groups:

1. Social drinkers – those offenders who seem to have made the simple mistake of drinking and driving at the same time.
2. Problem drinkers – those offenders who that truly have problems controlling alcohol consumption and problematic behaviors.

Obviously, the recidivism rates for the problem drinkers group are much higher than those of the social drinkers, and it is this sub-sample of the DUI offenders that are receiving increasing attention at legal, clinical and research levels. Consequently, there has been a growing interest in and emphasis on treatment for this problem drinker population (Inciardi, 1993; Kinlock, O'Grady, & Hanlon, 1999).

In recognition of the need for prevention and interventions efforts on multiple levels, DUI offenders have been frequently enrolled in alcohol abuse treatment programs (Caviola & Wuth, 2002). These programs typically treat a wide variety of alcohol abusers, including the “traditional” dependent alcoholic, who has lost control over their drinking, often producing extremely heterogeneous treatment groups. Herein lies one of the problems with treating the DUI offender, as clear differences between the characteristics of the majority of DUI offenders and alcoholics may explain why outcome

of treatment is often less than satisfactory. Offenders are often mandated to complete treatment. However the perception of coerced treatment appears directly related to lower treatment motivation and retention. Moreover, the objectives of the treating DUI offenders seem too often to focus on simply reducing impaired driving, as opposed to promoting the recovery of the individual from alcohol abuse problems. These population and treatment issues have lead to an increased interest in effective assessment of alcohol abuse and appropriate treatment condition for DUI offenders.

Treatment of this population has offered mixed results but many researchers and clinicians are optimistic about improving treatment efforts, based on anecdotal and growing empirical evidence that supports the success of certain intervention strategies. These approaches have generally produced a decrease in abusive drinking and an improvement in psychosocial functioning (Bloomberg, Preusser, and Ulmer, 1987; Klein, 1989; Sadler & Perrine, 1984; Tashima & Peck, 1986; Nichols & Ross, 1989; Wells-Parker, 1994). However, recidivism rates for this population remain unacceptably high, even for those offenders who have completed intensive treatment programs and the need for clinical research in the treatment of DUI offenders (problem drinkers) is great. Moreover, there is a dearth of well-designed and controlled clinical studies (both process and outcome) with this population. While some minor work has been done to examine treatment components in prison settings with other incarcerated, criminal populations (Leukefeld & Tims, 1992), which might be loosely compared to DUI offender population, this research appears to tell us very little about what works and what does not when working DUI offenders in outpatient treatment setting.

Treatment modalities are diverse and rarely standardized, making even elementary judgments about the efficacy of interventions extremely difficult. The standards and implementation of such outpatient programs vary from state to state. The Institute of Medicine's 1990 report on interventions for alcohol problems noted that there has been no recent review of structural and operating characteristics of these programs nor any comprehensive evaluation of their effectiveness. Ultimately, the coerced treatment of DUI offenders needs to be examined in controlled clinical trials that take into consideration the unique treatment issues associated with conducting therapy with the population.

Treatment Issues with DUI Offenders

As is the case with the heterogeneity that exists within most patient populations, not all alcoholics or alcohol drinkers are "made the same". DUI offenders can differ significantly among themselves, suggesting that this population comprises a fairly heterogeneous group (Veneziano & Veneziano, 1992; Nochajski, Miller, Wierczok, & Whitney, 1993). For example, they appear to differ in their motivation for alcohol use, in their specific drinking behaviors, and in their incentives and goals to pursue treatment. Consequently, it has been repeatedly demonstrated that not all problem drinkers respond optimally to any one specific treatment intervention (Margolis & Zweben, 1998; McLellan, Alterman, Woody, & Metzger, 1992; Project MATCH, 1997).

The factors related to success in the treatment of DUI offenders are complex in nature and are certainly associated with the personal characteristics and unique substance abuse patterns and history of the client. However, the major issue in regards to treatment outcomes appears to be that these offenders are most often in what is often referred to as

“coerced treatment”. Removing some of the voluntary nature of their participation in treatment seems to have a direct effect on their motivation to change, resistance to treatment methods, and, consequently, high recidivism rates (Ginsberg et al., 2002). With this in mind, the DUI offender often presents with critically different treatment issues than many other types of alcohol abusers (Margolis & Zweben, 1998). For example, DUI offender’s treatment goals may revolve solely around fulfilling a legal requirement related to their offense, such as maintaining or restoring their driving privileges.

Research (Wieczorek, Callahan, & Morales, 1997) has consistently shown that many DUI offenders view treatment as having a high cost and a low benefit. Consequently, many DUI offenders in treatment express an ambivalence about any substantial benefit for change, viewing their participation in treatment as a result of a single event, the DUI offense, and not as a result of problematic behaviors related to alcohol consumption. In general, DUI offenders often resist formal treatment efforts. This resistance may manifest itself in low engagement during treatment, low levels of participation (including missing and arriving late for sessions), and early dropout from treatment.

Several studies have established that DUI offenders who fail to complete treatment have higher recidivism rates than do those DUI offenders who do complete treatment (Nochajski, 1999; Nochajski, Miller, Wieczorek, & Whitney, 1993; Nochajski & Walter, 1998). Subsequent offenses often lead to beginning the treatment process all over again. Successive involvements in treatment may adversely affect motivation to

change and increase resistance, decreasing even more the likelihood of successful recovery and thus elimination of future offenses.

Motivation for Change in DUI Offenders

DUI offenders have often been noted, in clinical assessment, to possess relatively little motivation to change. Research has shown that a major contributor to early treatment dropout (Ryan, Plant, & O'Malley, 1995; Stewart & Montplaisir, 1999) and poor outcome in substance-abuse treatment is low client motivation for treatment (DeLeon & Jainchill, 1986; Simpson & Joe, 1993), and indeed, DUI offenders show from high treatment attrition rates and poor treatment success, including high recidivism rates. Lack of internal motivation is particularly apparent in settings in which offenders are referred or mandated to treatment by the criminal justice system (Farabee, Prendergast, & Anglin, 1998), as is the case with many in this population. This circumstance is not surprising. When the idea of change or treatment is forced on an unwilling recipient, it is not uncommon for the individual to engage in problem behavior to a greater extent in an attempt to assert his or her freedom (Brehm & Brehm, 1981; Miller & Rollnick, 1991). Others will simply participate in the treatment program with little personal investment in behavioral change.

Similar to other criminal-justice populations, DUI offenders typically lack sufficient internal motivation to recognize, let alone reduce, their substance abuse, increasing the need for motivational enhancements to treatment interventions. Enhancing problem drinker motivation to engage and remain in treatment may be particularly relevant for this population, because the outpatient programs that often treat such offenders tend to have varying levels of structure, control, and supervision. Anecdotal

evidence suggests that problem drinkers often *appear* to be motivated for treatment and/or behavior change, given they realize they stand to suffer a substantial loss if convicted, namely, their driver's license.

MI and DUI Offenders

Many criminal justice workers acknowledge that offender motivation is a critical component to the behavior change process (Ginsberg et al., 2002), therefore an increasing recognition by mental health professionals, who work with such populations, is on what can be done to help offenders engage and remain in programs that focus on changing criminal behavior. Theoretically, MI represents a potential therapeutic tool that would target or address many of the treatment issues specific to working with DUI offenders (Miller & Rollnick, 2002), and the little empirical support exists to support or challenge this conjecture. Moreover, as discussed previously, the MI intervention was initially developed to enhance the treatment efficacy in drug-abusing populations.

Therefore, the basis for implementing and evaluating a MI intervention with this population is built on the empirical and theoretical foundation of such motivational techniques with similar alcohol-abusing populations. Although there may be some procedural adjustments to administering MI to this population, the same basic principles remain the same: eliciting client concerns, reflecting ambivalence, and allowing the client to develop a plan for change that best suits him or her (Ginsberg et al., 2002). Thus, MI attempts to restore some of the offender's control over treatment process that is perceived as lost in the coercive aspect of treatment. Additionally, outcome research (Annis & Chan, 1983; McMurrin & Hollin, 1993; Murphy & Baxter, 1997; Walker, Daniels & Murphy, 1997) suggests that the authoritarian approach to prompting behavior change is

less effective than those that target internal motivation, creating a more conducive atmosphere for the offender to feel in control. The belief that harsh treatment is good for offenders is simply untrue (Andrews, Zinger, et al, 1990).

MI offers a brief, adaptable, and inexpensive supplement to treatment with DUI offenders. It has demonstrated significant benefits in treating alcohol abuse in similar populations and this study will attempt to establish some empirical support for its efficacy with problem drinkers in an outpatient treatment program.

As mentioned previously, despite the sizeable empirical evidence supporting the usefulness of MI with non-correctional populations of individuals experiencing alcohol abuse or dependence (Miller, 1996), motivational enhancements approaches to treatment have only received preliminary attention in the context of outpatient treatment programs for DUI offenders. At this point, the literature on DUI still tells us very little about the direct relationship between MI interventions and the treatment compliance and treatment retention of DUI offenders, particularly repeat offenders. But these studies do advise that further research is warranted.

CHAPTER 3: THE CURRENT STUDY

Research Rationale

The primary purpose of this study was to examine both the treatment process and outcome associated with the introduction of Motivational Interviewing (MI) as a component of treatment with DUI offenders in an outpatient community mental health center setting. Although the initial focus in the development of the MI model and approach was the alcohol abuse population, outcome research specific to DUI offenders in this type of outcome treatment setting is sparse. The growing volume of MI-related outcome research has demonstrated efficacy with a variety of clinical populations and addiction patterns (Miller & Rollnick, 2002), suggesting that further study of its clinical utility in treating DUI offenders is warranted. Indeed, there appears to be promise in conducting research to assess its efficacy in reducing the general symptoms and specific behaviors of DUI offenders, who represent a unique sub-sample of the problem drinkers who enter treatment.

Research has shown that a major contributor to early dropout and poor outcome in substance-abuse treatment is low client motivation for treatment (DeLeon & Jainchill, 1986; Simpson & Joe, 1993). Lack of internal motivation is particularly evident in settings in which offenders are referred or mandated for treatment by the criminal justice system, as is ostensibly the case with the majority of problem drinkers (to include DUI offenders). Moreover, research has consistently shown that many DUI offenders view treatment as having a high cost and a low benefit, express an ambivalence regarding the need for change, and often resist formal treatment efforts (Ginsburg et al., 2002). Additionally, DUI offenders who fail to complete treatment have higher recidivism rates

than do those offenders who complete treatment (Nichols & Ross, 1989; Sadler & Perrine, 1984; Tashima & Peck, 1986; Wells-Parker, 1994). Considering the substantial and ever-present contingency of DUI offenders within the criminal justice system (Caviola & Wuth, 2002; Margolis & Zweben, 1998) and the increasing emphasis on treatment for this population, development of interventions to enhance treatment engagement becomes all the more important.

Based on research with motivational-focused treatment models, a brief MI-focused intervention should facilitate readiness for, and involvement in, outpatient treatment and improve treatment retention, ultimately increasing the likelihood of successful outcomes to treatment. There is empirical evidence (T. H. Bien et al., 1993; Borsari & Carey, 2000; J. M. Brown & Miller, 1993; Dench & Bennett, 2000; Handmaker et al., 1999; Heather et al., 1996; Marlatt et al., 1998; Monti et al., 1999) to suggest that MI interventions, as short as 2 sessions, may be effective in helping problem drinkers more quickly and successfully navigate the stages of change, but further investigation is needed. Consequently, this clinical study was conducted to establish that MI should be considered an important component of outpatient treatment programs, targeting problem drinkers, as an extremely cost-effective predictor of successful outcomes.

Variables of Interest

This clinical trial examined the relationship between three explanatory concepts and three distinct treatment outcome variables. In addition to the primary explanatory variables, demographic variables such as age, therapist, and treatment center were controlled statistically.

The three explanatory concepts included the following:

1. *Treatment Condition*: Participants were randomly assigned to either a MI Treatment condition or a Control condition.
2. *Treatment Motivation*: Participants' motivation for change assessed with a self-report instrument that produced 3 sub-scales: *problem recognition*, *desire for help*, and *treatment readiness*).
3. *Recidivism Status*: Participants were classified as either first-time or repeat offenders.

The primary treatment outcome variables included the following:

1. *Treatment Participation*: An assessment of treatment involvement per self-report and a report from outpatient counselors that includes three sub-scales: *self-confidence*, *motivation*, and *rapport*.
2. *Treatment Engagement*: A behavioral record of program retention (i.e., enrollment status in program), treatment attendance (i.e., number of session attended and missed), and compliance to treatment requirements i.e., number of positive UAs).
3. *Drinking Behaviors*: A detailed summary of drinks consumed during a 30-day period prior to assessment.

Primary Hypotheses

The original hypothesis of interest was that a significant Treatment Condition X Treatment Motivation interaction would occur. However, due to the complexity of the statistical model, exploring this hypothesis directly was not feasible. However, additional hypotheses of interest were that a Treatment Condition main effect and a Treatment

Condition X Recidivist Status interaction would be found. It was anticipated that MI would demonstrate a positive impact on the treatment outcome variables in this study as had been demonstrated with previous clinical trials with MI with alcohol abusers, as well as other treatment populations. It was also anticipated that there might be a differential impact of MI on participants based on their recidivist status (i.e., recidivists or first-time offenders may particularly benefit from a MI intervention). Continued exploratory interest in the role of motivation was the basis for maintaining the motivation variables in the model.

CHAPTER 4: METHOD

The Participants

The participants ($N=98$) for this study were recruited from a population of DUI offenders who were admitted for outpatient treatment at one of four treatment sites (see **The Treatment Sites**, below) of a community-based substance abuse treatment clinic in Baltimore County. DUI offenses included any kind of violation of law related to drinking and driving that could have occurred at any time in the client's past, for which he or she was currently seeking treatment, or had been mandated to treatment by the courts.

A recent report (Givens, 2003) of the demographic makeup of the DUI population at the four treatment sites indicates that approximately 325 DUI offenders were seen by treatment site counselors (Givens, 2003) in 2002, representing approximately two-thirds of the new substance abuse cases opened at the four clinic sites during that year. Moreover, the number of repeat offenders at the four treatment sites is estimated to be approximately one-third to one-half of the caseload of DUI offenders. All DUI offenders who were admitted during 2002 were adults. Approximately 75% of clients were male. The general racial makeup of this population was broken down into the following categories: 83% White, 13% Black, 1% Asian/Pacific Islander, and 6% Other. The ethnic makeup of the White population was further broken down into the following categories: 3% Mexican, 1.5% Other Hispanic, and 95.5% not Hispanic.

During an initial interview at all treatment sites, a thorough assessment of the drinking patterns of the DUI offender is conducted by a qualified mental health care professional or counselor at one of the outpatient clinics. This initial evaluation

determines the type of drinking profile (i.e., severity of drinking problem; *social drinker* or *problem drinker*) of each DUI offender and culminates in a proposal for treatment intervention to the court system, based on the assessment information. This assessment is mandated by the Maryland Alcohol and Drug Abuse Association (MADAA) and the assessment information is presented to the court or judge, where offenders are then sentenced to an appropriately corresponding treatment protocol, depending on whether or not they have been assessed as a social or problem drinker. Moreover, treatment recommendations most often include outpatient treatment settings approved by the MADAA, although they may be referred to appropriate inpatient treatment programs. For example, those clients assessed as *social drinkers* are typically assigned to 13 weeks of psychoeducational treatment, whereas those clients who are categorized as *problem drinkers* are typically assigned to 26 weeks of combined psychoeducational, cognitive-behavioral, and 12-step facilitation therapy group treatment.

It may also be determined that offenders fall into a third group commonly described as *primarily drug-involved drinkers*, or DUI offenders whose principal substance abuse problem revolves around a drug other than alcohol. However, these types of cases are significantly less common at the outpatient clinics used in this study.

The group of interest in this study was the *problem drinker* population, as the majority of clients with an arrest or charge for a DUI-related offense are typically found, on the basis of MADAA-mandated assessment, to be members of this group. No exclusions were made with regard to gender or race/ethnic group. No adult who is decisionally-impaired was knowingly admitted to participate in this study.

Additionally, anyone under the age of 21 was not recruited for inclusion in this study. Empirical research and sociological data (Statistical Bulletin, 1993; Burnside, Baer, McLaughlin, & Pokorny, 1986; Copans & Kinney, 1996; Kinney, 1989) suggest that the problems associated drinking in childhood and adolescence can differ significantly from those associated with an adult population. Consequently, it is assumed that younger populations should be treated differently in terms of assessment and intervention.

In summary, only those clinic clients who were 1) convicted of or charged with a DUI offense, 2) assessed to fall into the category of problem drinker, 3) primarily seeking alcohol abuse treatment (versus drug abuse treatment), and 4) at least 21 years old were eligible for enrollment in the study.

The Treatment Sites

The four outpatient treatment sites that provided access to clients for this study were outpatient community mental health centers located in Baltimore County. These sites are branches of a single community-based substance abuse treatment clinic. All sites offer a comprehensive outpatient treatment program to people whose lives have been adversely affected by alcohol and other drugs, including a variety of drug-free therapeutic, preventative, and educational services to children, teenagers, adults, and their families, and have been providing counseling services to the community for over 28 years. The clinic staff consists of trained mental health professionals from various human service professions. The majority of the substance abuse counselors who work directly with patients are trained masters-level social workers and all counselors are certified alcohol and drug abuse counselors (CADACs). Regardless of level of education, all

counselors have participated in intensive training in the treatment of substance abuse populations in an outpatient setting.

These treatment sites are among the MADAA-endorsed clinics which are funded by various county and state agencies, including MADAA, Maryland Department of Health and Mental Hygiene (DHMH), Baltimore County Bureau of Substance Abuse, and Baltimore County Office of Safe and Drug Free Schools. These clinics play a critical role in the state's process for prevention, assessment and treatment of alcohol and drug abuse problems. Moreover, all of the treatment sites' outpatient interventions are approved by the MADAA. Because most individuals convicted of a DUI offense are mandated by the courts or are highly encouraged by their legal counsel to attend and successfully complete an MADAA-approved outpatient treatment program, these treatment sites offer a readily available and appropriate treatment environment for the DUI offender population.

The Assessment Process

The intake assessment process is generally uniform across all four treatment sites and includes a full biopsychosocial assessment of the potential client's current and past functioning. The intake counselor completes a state-approved, structured interview that contributes valuable data to a statewide database on DUI offenders and additional assessment instruments, including the Michigan Alcohol Screening Test (MAST) and Addiction Severity Index (ASI).

The MAST is a 22-item self-report assessment of drinking problems where a score of 6 or higher categorizes the offender as a "problem drinker" (Selzer, 1971). This measure is employed by the treatment site intake counselors for assessment and treatment

planning purposes. This instrument is one of the most commonly evaluated self-report alcohol assessment tools. Although there appears to be a large variation in reports and research findings with the instrument, a number of reviews (Ross, Gavin & Skinner, 1990; Storgaard, Nielsen & Gluud, 1994; Teitelbaum & Mullen, 2000) suggest that it is a generally valid and reliable (i.e., good internal-consistency reliability, as indicated by Cronbach's alpha coefficients of .83 to .93) instrument for alcohol abuse assessment and diagnostic purposes.

The ASI has become a standard assessment tool for alcohol and other addictions (Leonhard et al., 2000). The ASI is an interview that assesses history, frequency, and consequences of alcohol and drug use. It yields scores on seven domains that are commonly associated with alcohol/drug use: drug, alcohol, medical, employment/support, legal, family/social, and psychiatric functioning. Scores on the ASI vary between 0 and 1 and higher scores indicate a greater need for treatment in the respective domain of the individual's life.

Data from these assessment instruments and the clinical interview are used to profile potential patients' problem areas and plan effective treatment efforts. The intake counselors then make treatment recommendations, including assignment to one of the site's group treatment programs.

The Treatment Model

Problem drinkers required to attend the 26-week treatment program are involved in a standard group-treatment model while enrolled at the treatment sites. Group sessions are ongoing weekly events and involve rolling admissions. Because of the numerous limitations, individual therapy sessions are rarely offered. Group sizes will vary, because

of the rolling admission policy, but typically involve 5-10 clients in a given session. Groups generally tend to be heterogeneous in terms of client demographics. However, it should be noted that some groups are defined as either DUI-only, consisting exclusively of DUI offenders and *problem drinkers*, or mixed-offender, consisting of *problem drinkers* and clients in treatment for other substance abuse problems.

Clients are required to be on time for all sessions, but are given a 10-minute grace period before they are not given credit for attendance at any one session. Missing (or not receiving credit for) five group sessions before successful completion of the treatment program, is grounds for immediate termination of services and discharge from the program. An additional reason for discharge is testing positive for alcohol use on a urine sample drug screening, which is administered periodically and randomly by the clinic over the course of a client's treatment obligation. Urine samples are typically collected once every 2-4 weeks and results are returned to the treatment sites with a week. Testing is done for all major categories of illicit drugs in addition to alcohol. Clients are informed of any positive tests results at their next visit and the potential impact of a positive test result is made explicit at treatment outset, and emphasized when urine test results are discussed with a client.

If clients are officially discharged from treatment at one of the sites, they are often given the option of re-enrolling in the same program after another intake evaluation session is conducted. However, they do not receive any credit for previous treatment participation and are required to start over again and complete the full 26-week plan. It should be noted, however, that in terms of this study's sample, no clients had been officially discharged and re-enrolled in the treatment program at the time of the 3-month

follow-up. When clients follow-through on all the requirements of the treatment program (i.e., attend enough required treatment sessions) they are discharged and released from further obligation to the clinic. At this point, the Court and the Maryland Department of Motor Vehicles are notified of the client's successful completion of the treatment program.

The general treatment model implemented at the clinics is a group format approach that incorporates some cognitive-behavioral strategies into a modified version of 12-Step Facilitation Therapy (Nowinski, Baker, & Carroll, 1995). This model is based, for the most part, on the rehabilitation steps of the traditional Alcoholics Anonymous (AA) model and is employed with both the DUI-only and mixed-offenders groups. Clients enrolled in treatment at the clinics and recruited for participation in the study were involved with one of seven different counselors at one of the four treatment sites. However, these counselors remained consistent as the facilitators of their respective groups over the course of the study.

Each client's progress is reviewed individually by their treatment counselor at least every 90 days, though often on a more frequent basis. Therapy and session records are kept by the counselors, documenting attendance, level of participation, individual progress, and completion of the treatment program.

Study Procedures

Pre-intervention Session. Immediately following their initial intake interview and enrollment in the treatment program at a clinic site, potential participants met briefly with the project investigator who solicited their consent to participate in the study. During this pre-intervention session, the purposes of the study and the details of their

participation were comprehensively explained to each potential participant. During this phase of the research, there were only a total of 2 clinic clients who refused to participate in research. Those clinic clients who consented to participate in the study completed written consent forms (see Appendix A) and were given a copy of the form for their personal reference.

After obtaining informed consent, participants were asked to complete two assessment tasks during the remaining time of the pre-intervention session. These tasks took approximately 30 minutes and included the following:

(1) A 24-item treatment motivation measure [*Client Evaluation of Self at Intake* (CESI), see Appendix B] (Knight, Holcum, & Simpson, 1994; Simpson & Chatman, 1995)

(2) A structured interview with the investigator [*Timeline Follow Back* (TLFB), see Appendix C] that tracks specific substance-abuse behaviors during the 30-day period prior to their enrollment for treatment at the clinic (Sobell & Sobell, 1992, 1996).

Treatment Group Assignment. Upon completion of the initial assessment tasks, participants were then randomly assigned to one of two study treatment groups, including an experimental MI Condition ($n=48$) or a Control Condition ($n=50$). Participants were informed of the random nature of this assignment and the details of the appropriate protocol were carefully explained.

Participants in the Control Condition continued with the clinic's usual treatment protocol with no additional components, interventions, or changes to procedure. These clients normally returned to the clinic the following week and began regular participation in the group treatment program as prescribed by the clinic's protocol. They were

informed that their participation in the study would then culminate with a brief 3-month follow-up session with the investigator.

Participant in the MI Condition received a two-session MI-based intervention prior to continued participation in clinic's treatment protocol. Following intake, participants assigned to this condition returned to the clinic for two weekly MI-based individual therapy sessions in place of attendance at the clinic group treatment sessions. Attendance at these sessions counted toward their required total sessions in order to receive successful discharge from the program. After attending the initial two sessions with the MI counselor, these participants then returned the following week to continue with the clinic group to which they were originally assigned. Their individual cases were then managed by their assigned clinic counselor through the remaining course of their treatment.

The MI therapist. A single advanced doctoral student therapist administered all MI-based individual therapy sessions for this study. This therapist was trained in the MI model by a certified MINT (Motivational Interviewing Network of Trainers) trainer over the course of a 2-day workshop. Training included specialized instruction and guidance in administering motivational intervention strategies with substance-abuse populations. The trainer conducted brief follow-up meetings by phone to monitor the therapist's implementation of the prescribed intervention. Ongoing clinical supervision of the therapist was conducted by a clinical faculty member, supervising staff from treatment sites, and the certified MI trainer.

Implementation of the MI Intervention. During the MI-based individual therapy sessions, participants met with a therapist who was trained specifically in the MI

model. These two sessions generally lasted 40-60 minutes and focused on the participant's motivation to change and desire to achieve a successful outcome through participation in this treatment program. The nature of this outcome (i.e., the treatment goals of each participant) was not specified during the MI sessions, although there was a general effort to guide change-talk toward decreasing drinking behaviors. Moreover, the MI sessions did not target reduced drinking and driving, and was not coordinated with the specific treatment goals of the outpatient programs.

The format of these two sessions (see Appendix D) is a direct adaptation of the initial sessions originally employed in the multi-site clinical trial Project MATCH (Miller, Zweben, DiClemente, & Rychtarik, 1999). This decision to implement only the first two sessions of the original 4-sessions format is both theoretically and empirically supported. Theoretically, the recommendation of Dr. William Miller (Miller & Rollnick, 2002), who is the primary developer of MI, is that content and objectives of the first two sessions include the essential ingredients of the treatment and should always be implemented. Consequently, he considers the booster sessions (the last two of the four introductory sessions) as not being central to the intervention's effectiveness. Empirically, a convincing number of MI outcome and process studies suggest that the implementation of only one or two sessions is both adequate and effective with alcohol abuse populations (see Bien et al., 1993; Borsari & Carey, 2000; Brown & Miller, 1993; Dench & Bennett, 2000; Heather et al., 1996; Marlatt et al., 1998; Miller et al., 1993; Monti et al., 1999; Murphy et al., 2001).

In summary, the first treatment session focused on establishing the rationale for a client-centered approach, obtaining information regarding problems associated with level

of alcohol use and related problems, and building client motivation to initiate or continue change. A balance sheet was employed to facilitate the client's evaluation of the pros and cons of drinking behavior change.

This initial session also included conducting a brief subjective assessment of the participant's readiness for change behaviors related to alcohol use. Using a 10-point Likert scale (range 1-10), these ratings were obtained from both the participant at the beginning of the session and the therapist at the end of the session (see Appendix D). These data were collected to supplement the motivation for change information collected through the self-report motivation measures administered at treatment intake.

The second session continued the motivational enhancement process, working toward consolidating the client's commitment to change. This session entailed structured feedback, providing clients with a written personal feedback report containing baseline assessment information. A change plan worksheet was used during this phase of treatment to aid the client in specifying their action plan. The conclusion of the process involves the generation of a formal commitment to change on the part of the client.

Treatment Fidelity. In order to evaluate the validity of the MI treatment implemented in this study, a measure of treatment fidelity was utilized. The Motivational Interviewing Treatment Integrity (MITI) Code (Moyers, Martin, Manuel, & Miller, 2003) was implemented to accomplish this purpose. The MITI was developed to code audiotaped (or videotaped) motivational interviewing interactions between a therapist and an individual client during a treatment session. Trained coders carefully evaluate the content and process of the session following the MITI guidelines. The MITI Code was developed out of the more extensive MI coding system called the Motivational

Interviewing Skills Code (MISC; Miller, Moyers, Ernst, & Armhein, 2003) as a tool for assessing how comparable an intervention is to traditional motivational interventions.

The procedure implemented in this study involved trained coders reviewing recorded therapy segments using the MITI Coding Sheet (see Appendix F), giving segments global ratings on empathy and spirit of MI and completing behavioral counts for MI-related therapist behaviors. The two global ratings are made using a 7-point Likert scale. Specific performances of the therapist that are under evaluation include giving information, MI-adherent behaviors (i.e., asking permission, affirming, emphasizing control, support), MI non-adherent behaviors (i.e., advising, confronting, directing), open and closed questions, and simple and complex reflections. The behavioral counts are then used to calculate four summary scores:

- Reflection to Question Ratio (R:Q)
- Percent Open Questions (%OC)
- Percent Complex Reflections (%CR)
- Percent MI-Adherent (%MIA)

These MITI summary variables or behavioral indices have been recommended as provisional summary indicators of the quality of motivational interviewing (Miller, 2000). Based on the performance of novice and expert therapists, Moyers et al. (2003) suggest the following performance benchmarks for beginning proficiency in motivational interviewing:

- Global Therapist Ratings: 5
- Reflection to Question Ratio: 1
- Percent Open Questions: 50%

- Percent Complex Reflections: 40%
- Percent MI-Adherent: 90%

The MI therapist ratings were then compared to these benchmarks as a further effort to ensure that the quality of the implementation of the experimental intervention is adequate. In general, these indicators are oriented towards assessing the elements of effective MI therapy and the characteristics of an effective MI therapist. Generally, an effective MI therapist will talk less than the client does, use reflection as the most common response, reflect at least twice for each question asked, use complex reflections at least half the time, use mostly open questions when inquiring, and avoid getting ahead of the client's level of readiness.

For this study, 23 randomly-selected individual MI session segments (each of approximately 20 minutes in duration) were evaluated using the MITI system. Before recording the randomly-assigned MI sessions, the purpose of the recording was explained to the client and informed consent was obtained by the MI therapist (see Appendix E).

In consultation with the dissertation director, it was decided that a minimum of 20 randomly-selected sessions would be necessary for adequate statistical analyses and sufficient representation of the nature of the treatment being administered. This number was exceeded to ensure an ample number of recordings would be available for assessment.

Two independent coders, both with an undergraduate education background in psychology, were recruited and trained for the purpose of coding the recorded sessions. The coders were given general training in the MI model and then task-specific training for using the MITI code with recorded therapist-client interactions. Coders reviewed

practice interactions and coded transcripts to enhance training. Inter-rater reliabilities during training were calculated to be as high as .78. Although realistic inter-rater reliabilities are still in the process of being developed for the MITI and MISC coding system (Moyers & Ernst, 2001) it has been suggested that reliabilities between .65 and .85 (depending on the variable) are sufficient to permit independent coding.

Post-Intervention Session. Three months following baseline assessment, participants were contacted by the research investigator for a brief follow-up session. Worth noting, participants were at varying stages of the treatment progress at follow-up due to varying degrees of treatment compliance. While the vast majority of participants were still enrolled in treatment ($n=85$), there were a small percentage that had already dropped out of the program at 3-month contact ($n=13$). Efforts to contact study participants at follow-up were greatly facilitated by the extensive case management system of the treatment sites. Consequently, all participants initially enrolled in the study were able to be contacted for follow-up data collection, and all consented to this follow-up assessment.

During this follow-up assessment session, participants were asked to complete two assessment tasks which took approximately 15-20 minutes complete:

(1) A 12-item questionnaire, the *Client Evaluation of Treatment* (see Appendix G), which explores the client's regard for their counselor and satisfaction with treatment process (Knight et al., 1994; Simpson & Chatman, 1995).

(2) A structured interview with the investigator [*Timeline Follow Back* (TLFB), see Appendix C] that tracks specific substance-abuse behaviors during the 30-day period prior to their enrollment for treatment at the clinic (Sobell & Sobell, 1992, 1996).

In addition to the information that collected during the post-intervention session with the participant, each participant's treatment site group therapist was asked to complete the *Counselor Rating of Client* questionnaire (see Appendix H; Knight et al., 1994; Simpson & Chatman, 1995). This measure describes the general participation and motivation of the participant during treatment and can be compared to behavioral data and the participant's self-report measures.

Independent Variables

The following is a summary of the independent variables and measures of interest in this study (see Figure 1).

Treatment Variable: Treatment Assignment. Participants were randomly assigned to one of two treatment conditions in this study, including an experimental MI condition ($n=48$) and a control condition ($n=50$).

Explanatory Variables: Treatment Motivation. Initial treatment motivation was measured by three subscales from an established self-report instrument, the *Client Evaluation of Self at Intake* (CESI), administered during the pre-intervention session. The CESI (see Appendix B; Knight et al., 1994; Simpson & Chatman, 1995) is a self-report measure consisting of three subscales (24 items total) for assessing motivation for modifying personal behavior and undertaking treatment.

The three subscales measure different aspects of readiness to undertake behavior change, including the extent to which the client possesses the following:

(1) *Problem Recognition* - believes behavior problems are associated with his/her substance abuse

(2) *Desire for Help* - expresses concern about getting help to quit substance use

Figure 1: Independent and Outcome Variables List

Variable	Scale	Measure
<i>Independent Variables</i>		
1. Treatment Condition	Dichotomous	Random assignment
2. Treatment Motivation <ul style="list-style-type: none"> • Problem Recognition • Desire for Help • Treatment Readiness 	Continuous	<i>Client Evaluation of Self at Intake</i>
3. Recidivism Status	Dichotomous	Obtained from treatment site records
<i>Outcome Variables</i>		
1. Treatment Participation <ul style="list-style-type: none"> • Treatment Evaluation • Rapport • Motivation • Self-confidence 	Continuous	<i>Client Evaluation of Treatment</i> <i>Counselor Rating of Client</i>
2. Treatment Engagement <ul style="list-style-type: none"> • Compliance • Duration • Retention 	Continuous & Dichotomous	Obtained from treatment site records
3. Drinking Behavior <ul style="list-style-type: none"> • No. days since last drink • No. of days since last drink • No. continuous days drinking • Total no. days drinking • Total standard drinks • Most drinks in single day 	Continuous	<i>Timeline Follow-Back</i>

(3) *Treatment Readiness* - views the treatment program as significant to the process of change.

Separate scores for each of the three scales were calculated and used as predictors in this study. Test-retest reliabilities for the three subscales have been shown to vary between .74 and .87; moreover, the three subscales have been found to predict retention in treatment for 60 days or more (Simpson & Joe, 1993).

Explanatory Variable: Recidivism Status. Specific information about history of DUI offenses for each participant was obtained from client records at the treatment sites. Participants were categorized on the basis of their recidivism status as either first-time DUI offenders (i.e., no previous offenses recorded) or repeat DUI offenders (i.e., existing history of at least one offense recorded). This variable was statistically controlled during the data analysis. Additional data garnered from the client's file included total number of DUI violations of each offender and the amount of time lapsed since most the most recent offense date to the date of intake. As anticipated, the range of data on all three predictors varied greatly and descriptive statistics can be found in the Results section.

Control Variables: Age, Counselor and Group. As anticipated, general demographics of the study's sample were heterogeneous. For example, age of the client ranged from 21 to 66. This variable was statistically controlled during data analyses because of its potential impact on outcome, independent of treatment condition. Moreover, because there may be systematic variation among the four treatment sites and/or the seven treatment site counselors there exists the possibility that clients in each clinic or group might differ in terms of their responsiveness to the intervention.

Therefore, treatment site and counselor were included as additional random blocking factors in all analyses.

Outcome Variables

The following is a summary of the outcome variables and measures of interest in this study (see Figure 1).

Outcome Variables: Treatment Participation. The general level of each client's participation in treatment was measured by two rating instruments. One was administered to the client, the *Client Evaluation of Treatment*, and the other to the client's regular treatment site counselor, the *Counselor Rating of Client*. Both were administered at the time of the post-intervention session, six months following their enrollment in the study.

The *Client Evaluation of Treatment* (Knight et al., 1994; Simpson & Chatman, 1995) is a brief 12-item questionnaire, administered to a client who has recently been involved in a therapeutic relationship or treatment program. This scale yields a single score and examines different aspects of the client's cognitive and behavioral involvement and progress in treatment. Joe and colleagues (Joe, Broome, Rowan-Szal, & Simpson, 2002) examined the psychometric properties of this scale and found both good internal consistency reliability ($\alpha = .80$) and construct validity (i.e., confirmatory factor analyses suggest that the item pool does not represent more than one factor).

The *Counselor Rating of Client* (Knight et al., 1994; Simpson & Chatman, 1995) is a 48-item, Likert-scale instrument completed by the counselor in a therapeutic relationship at the conclusion of treatment. Counselors are asked to read a statement about the nature of the interaction and counseling activities that they experienced with a

particular client during the previously 3 months and rate the degree to which it describes their own experience with the client. The items are divided into two sections, with the first presenting items about the client's characteristics and the second including items about the counseling activities experienced with that client. This instrument includes the following three subscales:

(1) *Rapport*: client openness and honesty

(2) *Motivation*: client involvement in treatment

(3) *Self-confidence*: client assertiveness

Taken together, this measure describes the general participation and motivation of the participant during treatment. This information can be extremely helpful to clinicians and researchers when compared and contrasted to behavioral data and the participant's self-report measures, thus creating a more comprehensive picture of the process of the treatment.

The *Counselor Rating of Client* and *Client Evaluation of Treatment* have been administered to more than 1,000 clients in three drug-abuse treatment programs as a part of the DATAR research project (Simpson, Joe, Rowan-Szal, & Greener, 1995; Simpson & Joe, 1993). These measures were well received by clients in that research program and were employed to measure aspects of the client-counselor relationship and attitudes toward treatment. In this study, each of these scales was analyzed separately, as has been the practice in previous analyses of these measures.

Outcome Variables: Treatment Engagement. Careful review of the client's treatment site records yielded data related to each participant's treatment *compliance*, *duration*, and *retention*, behavioral measures of treatment outcome in this study. These

behavioral measures paint an overall picture of the client's treatment engagement over the course of their participation in the study.

Compliance was measured by calculating the number positive urine analyses during the first three months while enrolled in treatment.

Duration of treatment was calculated in two ways: 1) the number of missed sessions during the first 3 months of treatment, and 2) the number of individual or group sessions attended during the first 3 months of treatment.

Retention was determined by the actual status of client's enrollment in the program at 3 months, categorized as either "still enrolled" or "no longer enrolled".

Outcome Variables: Drinking Behavior. The drinking behaviors of each participant were measured by a single, reliable self-report interview, the *Timeline Follow-Back* (TLFB; L. C. Sobell & Sobell, 1992, 1996), conducted by the therapist during both the pre-intervention and post-intervention sessions. The TLFB is a 10-15 minute structured interview method that reliably assesses alcohol consumption (M. B. Sobell, Sobell, Klajner, Pavan, & Basian, 1986), by respondent's retrospective report of drinking behaviors over the designated time period.

Developers of this measure have operated under the assumption that each problem drinker has their own unique pattern and level of drinking, which to be accurately assessed, must be measured over time. In contrast to more the traditional summary methods (e.g., Quantity-Frequency, Lifetime Drinking History and Self-Monitoring) that have long dominated the alcohol field, the TLFB, first developed in the early 1970s (L. C. Sobell, Maisto, Sobell, & Cooper, 1979), asks clients to recall as accurately as possible

all their drinking that occurred during a specific time period. The TLFB method employs several procedures to aid recall of specific daily drinking (see Appendix C).

The decision to employ the TLFB method of data collection was based on need for appropriate level of accuracy (Addiction Research Foundation, 1993) and the flexibility of the time frame that might be assessed. The TLFB, like the Quantity-Frequency and Lifetime Drinking History methods, is retrospective, obtaining information about alcohol use after it has occurred. Self-monitoring is more prospective, as clients are asked to keep records of their drinking as it occurs. Several articles have outlined the advantages and disadvantages of each of these measurement approaches (Room, 1990; Skinner, 1984; L. C. Sobell & Sobell, 1992, 1995). Although empirical research has employed a variety of designated time periods, charting 30 days appears to be a valid and reliable indication of drinking behavior (L. C. Sobell & Sobell, 1996). With a regular monthly calendar on hand, the interviewer asks certain questions of the client to be able chart alcohol consumption over the past month

The TLFB method has gained international acceptance being referenced in publications from a dozen countries and has been evaluated with a variety of populations of alcohol abusers, from mild to severely dependent (L. C. Sobell & Sobell, 1996). The TLFB has also been employed with both male and female normal drinker populations, with adolescent substance abusers, black and white male and female college students, and with drinkers ranging in age from 16 to 70.

Found to have good measurement properties (L. C. Sobell & Sobell, 1992, 1996), the TLFB can profile pattern, variability, and level of drinking for problem drinkers, using such variables as percentage of days drinking at different levels, or pattern of

weekday/weekend drinking. Periods of relapse can be identified and explored with the subject. Hence, a variety of variables can be generated that provide more precise and varied information about an individual's drinking than that produced by summary techniques. Some commonly calculated variables are maximum number of drinks in one day, maximum number of continuous drinking days, percentage of all days in which drinking occurred, and percentage of days drinking at various levels (e.g., abstinent days, high-consumption days, low-consumption days).

In this study, information about the client's drinking behaviors during the 30 days prior to their enrollment in treatment at the clinic was collected during the pre-intervention session. During the post-intervention session, information about the client's drinking behaviors was collected for the 30 days leading up to the follow-up meeting. From this data, one simple variable was generated to measure drinking behaviors during the month previous to assessment: *total standard drinks consumed*. Although it is possible to generate a number of other behavioral variables from the TLFB data, it was decided that a simple measure of total alcohol consumption was the most appropriate representation of overall drinking behavior during a 30-day period, as well as an adequate outcome measure for analysis in the study.

Statistical Analysis

A generalized linear mixed model (GLMM) approach was utilized to analyze the data in this study. GLMM is suitable for continuous, discrete, and binary outcome variables (Breslow & Clayton, 1993; McCulloch & Searle, 2001; Wolfinger & O'Connell, 1993), as well as for both fixed and random predictor variables. As both an extension of the generalized linear model (McCullagh & Nelder, 1989) and the general

linear mixed model (Fahrmeir & Tutz, 1994; Lindsey, 1993; Littell, Milliken, Stroup, & Wolfinger, 1996; Verbeke & Molenberghs, 1997), GLMM allows for random effects in the model, as well as tests of significance when the distribution of variables is other than normal, such as binomial and Poisson. Additional advantages of this statistical approach are that it requires fewer distributional assumptions, is more robust to violation of the restrictive assumptions of the mixed-model ANOVA, allows for the appropriate estimation of random effects and their standard errors, is considerably more flexible in the presence of missing data, and has been shown to be less susceptible to bias in the analysis of binary outcome data (Liang & Zeger, 1986).

CHAPTER 5: RESULTS

Overview

Results of the data analyses are organized into three sections: 1) data related to the description of the sample; 2) regression analyses results for the study's primary hypotheses; and 3) results of secondary analyses. The distribution of DUI-offenders across treatment site and treatment counselor is shown in Table 1. Demographic data for the total sample and the two treatment groups and are shown in Tables 2, while means, standard deviations, and distributions of data related to drinking-related and DUI offense-related characteristics are presented in Table 3. Descriptive data for the baseline measures related to treatment motivation and specific drinking behaviors during the month prior to intake are presented in Table 4.

Results of the assessment of treatment fidelity, as evaluated using the MITI (Motivational Interviewing Treatment Integrity) system, are presented in Table 5. Table 6 presents the results for the internal consistency analyses of the motivational measures employed in this study. Correlational data for all measures is presented in Table 16 of Appendix I.

Next, in order to determine whether or not the MI intervention impacted the outcome variables of interest, a generalized linear mixed model (GLMM) approach was utilized to analyze the data (see the brief description at the end of the Methods section). The results of these analyses are shown in Tables 7-15. Finally, to further explore the clinical data available on the sample, various secondary analyses were conducted. Summary tables for these analyses may be found in Tables 17-47 of Appendices J and K.

Description of the Sample

In this section, both the total sample and the experimental and control groups will be described in terms of the demographics and pre-treatment variables, including DUI offense characteristics, assessments of severity of alcohol abuse, treatment motivation, readiness for change, and alcohol consumption. Inferential statistical analyses, including independent sample *t*-tests and chi-square (χ^2) goodness-of-fit tests, were performed to evaluate the possibility of pre-treatment differences between the experimental (MI) group and control (C) group within the recruited sample of clients.

Treatment site/counselor distribution. The distribution of recruited DUI offenders across treatment site and treatment counselor is shown in Table 1. Participants were recruited from all four treatment sites at rates comparable to the capacity and intake rates of each specific treatment site. Within the four treatment sites, seven different outpatient program counselors conducted treatment with this study's participants. Counselor 1 conducted all treatment with participants at treatment site 1. At the other three treatment sites, participants were assigned to work with one of two different counselors, depending on either group schedule or the demographics/treatment focus of various groups at the site.

The overall distribution of offenders recruited from each of the four sites (Site 1: 28, 28.6%; Site 2: 24, 24.5%; Site 3: 17, 17.3%; Site 4: 29, 29.6%) and the seven treatment counselors (Counselor 1: 28, 28.6%; Counselor 2a: 22, 22.4%; Counselor 2b: 2, 2.0%; Counselor 3a: 10, 10.2%; Counselor 3b: 7, 7.1%; Counselor 4a: 26, 26.5%, Counselor 4b: 3, 3.1%) is as anticipated, based on the recent enrollment trends of the treatment sites described previously. The apparent discrepancies between counselors 2a

Table 1

Distribution of Total Sample and the two Treatment Groups across Treatment Site and Counselor

Treatment site/counselor	Total (N=98) Distribution	MI (n=48) Distribution	Control (n=50) Distribution	χ^2	<i>p</i>
Treatment Site				.219 ^a	.974
#1	28 (28.6%)	14 (50.0%)	14 (50.0%)		
#2	24 (24.5%)	11 (45.8%)	13 (54.2%)		
#3	17 (17.3%)	9 (52.9%)	8 (47.1%)		
#4	29 (29.6%)	14 (48.3%)	15 (51.7%)		
Treatment Counselor				.771 ^b	.993
#1	28 (28.6%)	14 (50.0%)	14 (50.0%)		
#2a	22 (22.4%)	10 (45.5%)	12 (54.5%)		
#2b	2 (2%)	1 (50.0%)	1 (50.0%)		
#3a	10 (10.2%)	5 (50.0%)	5 (50.0%)		
#3b	7 (7.1%)	4 (57.1%)	3 (42.9%)		
#4a	26 (26.5%)	12 (46.2%)	14 (53.8%)		
#4b	3 (3.1%)	2 (66.7%)	1 (33.3%)		

Two-tailed test statistic (χ^2) compares means or frequencies between the MI and Control groups

χ^2 : Pearson Chi-square statistic

^a 0 cells (.0%) have expected values less than 5. The minimum expected count is 8.33.

^b 7 cells (50.0%) have expected values less than 5. The minimum expected count is .98.

and 2b and counselors 4a and 4b are due to the general case load of those counselors. Counselors 2a and 4a are the regular therapists for the DUI offender group session at their respective treatment site. Counselors 2b and 4b are therapists who run more heterogeneous substance abuse groups that occasionally include DUI offenders. Analysis of the distribution of study participants, recruited within treatment conditions, among treatment sites [$\chi^2(3) = .219, p = .97$] and among treatment counselors [$\chi^2(6) = .771, p = .99$] was found to be non-significant.

Demographics. As shown in Table 2, the total sample breakdown of race was as follows: 78.6% White, 13.3% Black, 4.1% Hispanic, with 1% American Indian, 1% Asian/Pacific Islander, and 2% unknown. Similar distributions were found in both the MI group (77.1% White, 14.6% Black, 2.1% Asian/Pacific Islander, 2.1% Hispanic, 4.2% Unknown) and the control group (80.0% White, 12.0% Black, 2.0% American Indian, 6.0% Hispanic). The difference in the distribution of ethnicity between the MI and C groups was not significant [$\chi^2(6) = 4.03, p = .67$]. In a major review of more than 130 original and review papers on DUI offenders nationwide, Kennedy (1993) found that the majority of DUI offenders are white (60-85%) indicating that the sample recruited in this study is similar to offender samples throughout the United States. In a study conducted by the Center for Substance Abuse Research (CESAR; Arria et al., 2005) that examined the characteristics of DUI offenders in the State of Maryland from 1995-2003, data on a large sample of DUI offenders ($N = 78,336$) revealed that the distribution of offenders across race to be 78.4% White, 15.3% Black, 4.4% Hispanic, and 1.9% other. Consequently, the distribution of participant race in this study's sample appears to be comparable to the offender population statewide.

Table 2

Demographic Characteristics of the Total Sample and the two Treatment Groups

Characteristic	Total (N=98)		MI (n=48)		Control (n=50)		Test Statistic (<i>t</i> or χ^2)	<i>p</i>
	<i>M</i> (<i>SD</i>) Skew Kurtosis	<i>f</i> (%)	<i>M</i> (<i>SD</i>) Skew Kurtosis	Frequency (%)	<i>M</i> (<i>SD</i>) Skew Kurtosis	<i>f</i> (%)		
<u>Race</u>							$\chi^2 = 4.034^a$.672
White		77 (78.6%)		37 (48.1%)		40 (51.9%)		
Black		13 (13.3%)		7 (53.8%)		6 (46.2%)		
American Indian		1 (1%)		0		1 (100.0%)		
Asian/Pacific Islander		1 (1%)		1 (100.0%)		0		
Hispanic		4 (4.1%)		1 (25.0%)		3 (75.0%)		
Unknown		2 (2%)		2 (100.0%)		0		
<u>Gender</u>							$\chi^2 = .170^b$.680
Male		93 (94.9%)		46 (49.5%)		47 (50.5%)		
Female		5 (5.1%)		2 (40.0%)		3 (60.0%)		
Age	37.14 (12.44) 0.391 -0.818		37.36 (12.79) 0.358 -0.885		36.92 (12.22) 0.435 -0.818		<i>t</i> (96) = .175	.862

Notes: Coefficients of skewness (g_1) and kurtosis (g_2) were computed using Fisher's K statistics ($k_2, k_3, & k_4$)
Two-tailed test statistics (χ^2 for Race and Gender and two-sample *t* test for age) compare means or frequencies between the MI and Control groups

χ^2 : Pearson Chi-square statistic

^a 10 cells (71.4%) have expected values less than 5. The minimum expected count is 0.48.

^b 2 cells (50.0%) have expected values less than 5. The minimum expected count is 2.45.

Comparison to the Baltimore County population of DUI offenders from 1995-2003, inclusive, from which this sample was recruited, reveals that no glaring differences in terms of race or ethnic background. According to county records, 82.9% of offenders are White, 14.2% of offenders are Black, and the remaining 2.9% are of American Indian, Asian/Pacific Islander, and Hispanic origins.

In terms of gender, 93 of the 98 recruited offenders were male (94.9%). Roughly equal distributions in gender were found in the treatment groups, where 46 of the 48 MI group participants were male (95.8%), while 47 of the 50 participants in the control group were male (94%). The difference in the distribution on gender in the two study conditions was not significant [$\chi^2(1) = .17, p = .68$]. The distribution of gender in this study is comparable to DUI offender samples in other research where 80-95% of offenders are male (Greenblatt & Bertolucci, 1994; Hedlund & Fell, 1995). The CESAR study found that only 80.6% of the DUI offenders in Maryland were male (Arria et al., 2005), which suggests that the sample recruited in this study may be over-represented by males. Although gender distribution from this sample appears to over-represent males in the state DUI offender population, this sample appears to be comparable, and much more representative, of Baltimore County demographics for this population (i.e., 82.5% of DUI offenders are male and 17.5% are female over a recent 8-year period).

Average age of the offenders in the study was 37.14 ($SD = 12.44$). The mean age of participants in the MI group ($M = 37.36, SD = 12.79$) and C group ($M = 36.92, SD = 12.22$) was not significantly different [$t(96) = .18, p = .86$]. This finding also suggests that the cohort recruited in this study is comparable to other DUI offender samples as the review of studies found that 80-95% of offenders are ages 20-45 (Kennedy, 1993). The

average age of DUI offenders in the CESAR statewide study was 35.0 (Arria et al., 2005). It should also be noted that the age at instant offense for DUI offenders in Baltimore County ($M = 36.17$, $SD = 11.75$) is comparable to the age of this sample.

Additional data regarding the sample's family income was available from intake paperwork at the treatment site. It was found that approximately 10% ($n = 9$) of approximately half of the sample ($n = 48$; 51%) fell in the \$10,000 to \$30,000 income range. 16 (17%) of the offenders had family incomes in the range of \$30,000 to \$50,000, while only 3 offenders had incomes greater than \$50,000. The income information for 18 of the offenders was unknown and data for 4 participants were missing. This data was considered supplementary and was not included in the results tables.

DUI Offense. In terms of recidivism, 54 (55.1%) of the participants reported that they were first-time offenders while 44 (44.9%) participants reported that they were repeat offenders, as shown in Table 3. Within the MI group the majority of offenders were in treatment for first offenses (25; 52.1%) versus 23 recidivists (47.9%). Similarly, the majority of offenders in the C condition were first-time offenders (29; 58.0%) while the remainder (21; 42%) were repeat offenders. The proportion of recidivists in the MI and C groups was not significantly different [$\chi^2(96) = 0.35$, $p = .56$]. The percentage of recidivists recruited in this sample (45%) is at the higher end of the range (21-46%) of convicted repeat offenders found in offender samples studied in other DUI-related research (Fell, 1995; NHTSA, 1994). Research suggests that approximately one-third (Hedlund & Fell, 1995) to two-thirds (Voas & DeYoung, 2001) of all drivers arrested and convicted of DUI offenses are repeat offenders.

Table 3

Means, Standard Deviations (SD), Skewness, Kurtosis and Distribution of Drinking-Offense Characteristics of the Total Sample and the two Treatment Groups

Characteristic	Total (N=98)		MI (n=48)		Control (n=50)		Test Statistic (t or χ^2)	p
	M (SD)	f (%)	M (SD)	f (%)	M (SD)	f (%)		
	Skew		Skew		Skew			
	Kurtosis		Kurtosis		Kurtosis			
<u>Recidivism</u>							$\chi^2 = .347$.556
Repeat offenders		44 (44.9%)		23 (52.3%)		21 (47.7%)		
First-time offenders		54 (55.1%)		25 (46.3%)		29 (53.7%)		
Total number of DUI arrests	1.65 (0.95)		1.69 (.97)		1.62 (.95)		t (96) = .349	.728
	2.280		2.280		2.357			
	7.352		7.462		8.203			
Time lapse from offense date to intake	535.46 (1082.99)		551.69 (1165.20)		519.88 (1009.46)		t (96) = .145	.885
	3.212		3.355		3.056			
	10.347		11.537		9.154			
MAST total score	7.71 (3.958)		7.23 (3.737)		8.19 (4.153)		t (92) = -1.175	.243
	1.355		1.194		2.343			
	1.841		1.038		1.487			
<u>MAST category</u>							$\chi^2 = 1.138$.286
Problem drinker		59 (60.2%)		27 (45.8%)		32 (54.2%)		
Not problem drinker		35 (39.8%)		20 (57.1%)		15 (42.9%)		
<u>ASI Composite Scores</u>								
Alcohol	.194 (.134)		.205 (.119)		.184 (.147)		t (94) = .766	.446
	1.224		0.656		1.000			
	.827		0.151		1.791			
Drug	.031 (.063)		.037 (.075)		.025 (.050)		t (94) = .913	.363
	3.213		3.238		2.279			
	14.063		13.345		4.990			
Medical	.146 (.252)		.142 (.250)		.150 (.257)		t (94) = -.158	.857
	1.631		1.560		1.743			
	1.432		1.060		2.000			

Employment /Support	.466 (.322) .182 -1.267	.438 (.338) 0.367 -1.223	.493 (.308) 0.014 -1.242	$t(94) = -.839$.404
Legal	.232 (.214) .439 -1.203	.240 (.215) 0.359 -1.272	.226 (.215) 0.531 -1.116	$t(94) = .324$.747
Family/Social	.059 (.113) 2.810 11.162	.055 (.123) 3.674 17.189	.062 (.103) 1.499 1.030	$t(94) = -.321$.749
Psychiatric	.063 (.108) 1.659 1.740	.044 (.090) 2.030 2.712	.081 (.120) 1.378 0.955	$t(94) = -1.730$.087
<u>Primary substance abuse problem</u>				$\chi^2 = .102$.749
Primarily alcohol	70 (71.4%)	35 (50.0%)	35 (50.0%)		
Co-morbid w/drug	28 (28.6%)	13 (46.45)	15 (53.6%)		

Notes: Coefficients of skewness (g_1) and kurtosis (g_2) were computed using Fisher's K statistics ($k_2, k_3, & k_4$)
Two-tailed test statistics (t for continuous variables or χ^2 for categorical variables) compare means or frequencies between the MI and Control groups

χ^2 : Pearson Chi-square statistic

MAST: Michigan Alcohol Screening Test is a self-report instrument of drinking problems where a score of 6+ categorizes the offender as a "problem drinker"

ASI: Addiction Severity Index is an interview that assesses history, frequency, and consequences of alcohol and drug use across seven domains. Scores fall in the interval 0 to 1, inclusive.

The average number of DUI convictions for the total offender sample was 1.65 ($SD = 0.95$). These data were comparable for both the MI group (1.69, $SD = 0.97$) and C group (1.62, $SD = 0.95$) conditions [$t(96) = 0.35, p = .73$]. Total number of DUI offenses is similar to the county DUI offenders population ($M = 1.65, SD = 1.01$).

Measuring the time elapsed (i.e., total days) from the most recent offense date to the time of treatment intake, the average number of days elapsed was 535.46 ($SD = 1,082.99$). The average time lapse for the MI group (551.69 days, $SD = 1,165.20$) was compared to that of the C group (519.88 days, $SD = 1,009.46$) and found that the two conditions did not differ significantly from each other on this variable [$t(96) = 0.15, p = .89$]. By comparison, the CESAR study (Arria et al., 2005) found that 56.5% of DUI offenders statewide were not assessed until 90+ days after offense, suggesting this study's sample may not be fully representative of the Maryland DUI offender population on this variable. In terms of describing the general time lapse between offense and intake for this sample, 12 offenders reported for treatment within 30 days of their DUI offense, 21 reported from 31-90 days, 21 reported from 91-180 days, and 22 reported between 181-365 days. The remaining offenders ($n = 22$) reported for treatment anywhere from 1 to 15 years following their most recent DUI offense. The extremely wide range of time lapse between offense and intake for this sample is even more notable when compared to the relatively shorter time lapse range (7 to 2800 days) and distribution ($M = 162.78, SD = 407.12$) for DUI offenders from county.

Michigan Alcohol Screening Test (MAST). Data ($n = 4$) are missing on this variable due to one treatment site having implemented use of a different alcohol/drug use assessment instrument during intake. Table 3 reveals that the average MAST score for

the total sample was 7.71 ($SD = 3.95$), while the MI group average was 7.23 ($SD = 3.373$) and the C group mean was 8.18 ($SD = 4.15$). Comparison of MI and C group means revealed that the two groups were not significantly different in terms of total MAST score [$t(92) = -1.18, p = .24$].

Scores from the MAST can be used to generate an additional categorical variable based on whether or not each offender exceeded the threshold (i.e., score of 6 or higher) to be classified as a *problem drinker*. In the total sample, 59 offenders (60.2%) were categorized as *problem drinkers*, while the remaining 35 (39.8%) did not meet the MAST criterion for problem drinker status. Within the two study conditions, the MI group had 27 of 47 (57.4%) offenders classified as *problem drinkers*, while relatively higher number (32 of 47, 68.1%) of the C group offenders fell into that category. The distribution of offenders categorized as *problem drinkers* between the two study conditions [$\chi^2(1) = 1.138, p = .29$] was not statistically significant. The CESAR study (Arria et al., 2005) established that 65.6% of DUI offenders in the state of Maryland are categorized as *problem drinkers* suggesting that the sample recruited in this study is comparable to the state population. Data from 1995-2003 revealed that 75.2% of DUI offenders who entered treatment in Baltimore County were assessed to be “problem drinkers” (Arria et al., 2003). This average appears markedly higher than the state average of 65.1% during that same 9-year period.

Addiction Severity Index (ASI). In terms of alcohol and drug use scores, ASI results (see Table 3) suggest a need for treatment plans aimed more at treating alcohol problems ($M = .194, SD = 0.13$) rather than drug-related issues ($M = .031, SD = 0.06$). The MI group’s average alcohol problem score of .205 ($SD = 0.12$) and C group’s

average score of .184 ($SD = 0.15$) did not differ significantly on this domain [$t(94) = 0.77, p = .45$]. Similarly, the two study conditions also did not differ in drug problems domain [$M = .037, SD = .08$ for the MI group; $M = .025, SD = .05$ for the C group; $t(94) = .913, p = .36$]. Missing data ($n = 2$) on this variable are due to unavailability of the hard copy file during the period in which the study was conducted.

The same non-significant pattern of results was found for the remaining five composite scores, although it should be noted that the employment/support and legal problems had the highest means in this sample: employment/support domain [$M = .466, SD = 0.32; M = .438, SD = 0.34$ for the MI group; $M = .493, SD = 0.31$ for the C group; $t(94) = -0.83, p = .40$], legal domain [$M = .232, SD = 0.21; M = .240, SD = 0.22$ in the C group; $M = .226, SD = 0.22$ in the MI group; $t(94) = 0.32, p = .75$], medical domain [$M = .146, SD = 0.25; M = .142, SD = 0.25$ in the MI group; $M = .150, SD = 0.26$ in the C group; $t(94) = -0.16, p = .86$], family/social domain [$M = .059, SD = 0.11; M = .055, SD = 0.12$ in the MI group; $M = .062, SD = 0.10$ in the C group; $t(94) = -0.32, p = .75$], and psychiatric domain [$M = .063, SD = 0.11; M = .044, SD = 0.09$ in the MI group; $M = .081, SD = 0.12$ in the C group; $t(94) = -1.73, p = .09$].

Although normative ASI composite scores have been established for number of clinical alcohol-abusing populations (see McLellan, Kushner, Metzger, Peters, Smith, Grissom, Pettinati, & Argeriou, 1992; McLellan, Alterman, Woody, & Metzger, 1992), there are, unfortunately, no established normative scores specific to the DUI offender population. However, compared to presumably similar DUI offender samples in Maryland (Arria et al., 2005), the ASI scores of this sample are comparable and participants in this sample appear representative of the local population from which they

were recruited. Compared to other substance-abusing samples in outpatient treatment (e.g., Reiber & Parent, 2000; Block, Bates, & Hall, 2003), this sample generally appears to have much more severe alcohol problems than other-drug (i.e., methadone, cocaine) abusers, but less severe problems than other alcohol abusers in treatment. Family/social and psychiatric problems appear to be comparatively lower in the DUI offender sample. However, the legal, employment/support, and medical problems of this DUI offender sample appear comparable to those of other non-criminal substance-abusing samples.

Primary substance abuse problem. As a step of the standard intake process for each client admitted into the outpatient treatment program, the assessment counselor categorized each offender into one of two categories, based on their reported use of alcohol and/or any other illicit drug. Each offender's primary substance abuse problem was classified as either *primarily alcohol*, indicating that alcohol use should be the focus of outpatient treatment, or as *co-morbid with drug*, indicating that the offender exhibits abuse patterns with both alcohol and illicit drugs.

Referring to Table 3, the overall distribution of offenders on this dichotomous variable indicated that 70 (71.4%) participants were categorized as *primarily alcohol*, while the remaining participants (28, 28.6%) were categorized as *co-morbid with drug*. Analysis of the distribution of offenders on this variable, within the two treatment conditions, revealed that there was no significant difference [$\chi^2(1) = .102, p = .75$] between the MI condition (35 of 48 as primarily alcohol, 73.0%) and control condition (35 of 50 as *primarily alcohol*, 70.0%).

Client Evaluation of Self at Intake (CESI). Baseline assessment of treatment motivation, as measured by the CESI (see Table 4), revealed the sample's *problem*

Table 4

Means, Standard Deviations (SD), Skewness, and Kurtosis for Baseline Assessment Measures of the Total Sample and the two Treatment Groups

Assessment Measures	Total (N=98)	MI (n=48)	Control (n=50)	<i>t</i>	<i>p</i>
	<i>M</i> (<i>SD</i>) Skew Kurtosis	<i>M</i> (<i>SD</i>) Skew Kurtosis	<i>M</i> (<i>SD</i>) Skew Kurtosis		
Motivation: Problem Recognition (PR)	27.65 (9.10) -0.358 -0.813	28.84 (8.716) -0.128 -0.279	26.51 (9.396) 0.451 0.439	1.272	.206
Motivation: Desire for Help (DH)	28.47 (8.76) -0.131 -0.307	28.99 (7.739) -0.406 -0.359	27.97 (9.685) 0.061 -0.350	.578	.565
Motivation: Treatment Readiness (TR)	29.92 (5.71) 0.300 0.465	29.82 (4.879) -0.612 -0.421	30.03 (6.461) -0.137 -0.944	-.179	.859
Participant's self-rating of readiness for change	5.13 (2.38) -.058 -.927	5.58 (2.422) -0.463 -0.549	4.70 (2.279) 0.322 -.0812	1.860	.066
Therapist rating of participant readiness for change	4.35 (2.09) .156 -.899	4.69 (2.095) -0.145 -0.174	4.02 (2.045) 0.479 -0.729	1.596	.114
TLFB: No. days since last drink	180.86 (462.64) 5.241 33.930	164.25 (358.030) 3.124 9.669	196.80 (547.923) 5.486 33.560	-.347	.730
TLFB: Longest period of abstinence	21.44 (10.14) -.577 -1.348	21.29 (10.390) -0.595 -1.383	21.58 (10.000) -0.573 -1.338	-.140	.889
TLFB: No. continuous days drinking	.95 (1.61) 3.883 22.679	.75 (.934) 1.022 0.037	1.14 (2.050) 3.458 15.735	-1.203	.232
TLFB: Total no. days drinking	2.68 (4.42) 2.537 8.362	2.44 (3.924) 1.980 3.528	2.92 (4.877) 2.773 9.977	-.538	.592
TLFB: Total standard drinks	10.22 (15.87) 1.703 2.127	9.35 (15.788) 2.007 3.512	11.06 (16.071) 1.487 1.352	-.530	.597
TLFB: Most drinks in single day	3.40 (4.88) 1.344 .670	2.98 (4.422) 1.457 1.020	3.80 (5.292) 1.240 0.362	-.832	.408

Notes: Coefficients of skewness (g_1) and kurtosis (g_2) were computed using Fisher's K statistics ($k_2, k_3, & k_4$)

Two-tailed test statistic (t) compares means between the MI and Control groups, $df = 96$

Motivation of client as measured by CESI (Client Evaluation of Self at Intake), a self-report instrument assessing initial treatment motivation

TLFB (Timeline Follow-Back) procedures is therapist-assisted self-report procedure assessing alcohol intake during a 30-day period leading up to intake

recognition (PR: $M = 27.65$, $SD = 9.10$), *desire for help* (DH: $M = 28.47$, $SD = 8.76$) and *treatment readiness* (TR: $M = 29.92$, $SD = 5.71$). These results can then be cautiously compared to norms (PR: $M = 27.45$, $SD = 6.48$; DH: $M = 23.24$, $SD = 3.71$; TR: $M = 24.96$; $SD = 3.84$) established with treatment-seeking individuals with substance-abuse problems in the DATAR project (Knight, Holcom, & Simpson, 1994). Consequently, although this study's sample appears comparable to in terms of *problem recognition*, the DUI offenders in this study appears to have a stronger *desire for help* and a higher *treatment readiness* than the similar substance- abusing samples in the research literature.

Statistical comparison of the treatment conditions on these measures of treatment motivation, revealed that the MI group (PR: $M = 28.82$, $SD = 8.72$; DH: $M = 28.99$, $SD = 7.74$; TR: $M = 29.82$, $SD = 4.88$) and the C group (PR: $M = 26.51$, $SD = 9.37$; DH: $M = 27.97$, $SD = 9.69$; TR: $M = 30.03$, $SD = 6.46$, respectively) were not significantly different from each other [PR: $t(96) = 1.27$, $p = .21$; DH: $t(96) = 0.58$, $p = .57$; TR: $t(96) = -0.18$, $p = .86$, respectively].

Readiness for change. As shown in Table 4, the sample's overall participant self-rating of readiness to change behaviors related to drinking was 5.13 ($SD = 2.38$). The difference between the MI condition ($M = 5.58$, $SD = 2.42$) and the C condition ($M = 4.70$, $SD = 2.80$) was not statistically significant [$t(96) = 1.86$, $p = .07$].

The MI therapist's rating of each MI participant's apparent readiness for change of behaviors related to drinking was generally lower ($M = 4.35$, $SD = 2.09$) than the self-rating scores that were obtained from participants (see above). However, similar to the participants' scores, the MI group ratings ($M = 4.69$, $SD = 2.10$) and C group ratings ($M =$

4.02, $SD = 2.05$), were also not significantly different from each other [$t(96) = 1.60, p = .11$].

Timeline Follow-back (TLFB). The TLFB was employed in this study as an outcome measure of drinking behaviors and alcohol consumption, and was administered both at baseline and at 3-month follow-up. Used as a baseline assessment of pre-treatment alcohol use, data from the TLFB on six drinking behavior variables (see Table 4) revealed some unique, but not necessarily unexpected, characteristics of drinking patterns prior to intake for this sample.

For example, the average number of days since last drink for the overall sample was 180.86 ($SD = 464.64$). However, this result is not entirely surprising given the unanticipated high number of days since DUI offense for the sample (see above). The C group ($M = 196.80, SD = 547.92$) and the MI group ($M = 164.25, SD = 358.03$) were not significantly different [$t(96) = -0.35, p = .73$] in terms of time period of abstinence prior to treatment intake.

The sample's average number of days for longest period of abstinence during the 30 days leading up to intake was 21.44 ($SD = 10.14$). The difference for the average number days for longest abstinence for the study conditions (MI: $M = 21.29, SD = 10.39$; C: $M = 21.58, SD = 10.00$) was not statistically significant [$t(96) = -0.14, p = .89$].

The entire sample averaged .95 ($SD = 1.61$) continuous drinking days during the 30 days leading up to treatment intake, and the MI group ($M = .75, SD = 0.93$) and the C group ($M = 1.14, SD = 2.05$) were not significantly different [$t(96) = -1.20, p = .23$] in this regard. Average total number of drinking days for the sample during 30-day period was 2.68 ($SD = 4.42$), with the MI group averaging 2.44 ($SD = 3.92$) and the control

group averaging 2.92 ($SD = 4.88$). Again, this group difference was not significant [$t(96) = -0.54, p = .59$]. The estimated average for DUI offenders in other studies is 8-12 drinking days in a 30-day period (Kennedy, 1993), suggesting that the sample recruited in this study has decreased drinking significantly at some point before treatment intake. However, it is not known when this decrease in alcohol consumption might have taken place (e.g., anytime from the month leading up to treatment to years prior to intake).

Total number of standard drinks was employed as the primary outcome measure for drinking behavior in this study. Baseline assessment found that the average number of standard drinks during the 30-day leading up to treatment intake for the sample was 10.22 ($SD = 15.87$). Similar to the previous TLFB variables, the difference between the C group ($M = 11.06, SD = 16.07$) and MI group ($M = 9.35, SD = 15.79$) was not significant [$t(96) = -0.53, p = .60$]. This same pattern holds true for the final TLFB variable (most drinks in a single day), which revealed that the C condition ($M = 3.80, SD = 5.29$) and MI condition ($M = 2.98, SD = 4.42$) were not significantly different [$t(96) = -0.83, p = .41$]. The sample average for most drinks in a single day during the 30-day period was 3.40 ($SD = 4.88$) which is lower than, but comparable to, other DUI offender samples which have found that 35-60% of offenders will frequently have 5+ drinks on a single day (Kennedy, 1993).

In summary, there were no significant treatment group differences on any of the demographic and baseline measures that might suggest a threat to the random assignment of participants to the MI group and C group conditions. Further details regarding the description of this sample can be found in the discussion section that follows.

Treatment Fidelity

The ratings obtained by the two independent coders for treatment fidelity were analyzed and summary data is presented in Table 5. As described in the **Methods** section, 23 randomly-selected individual MI session segments (each of approximately 20 minutes in duration) were evaluated using the MITI (Motivational Interviewing Treatment Integrity) system. Two independent coders were trained and rated the session segments according to MITI procedural guidelines.

In terms of the global ratings (range 1-7), the average rater score for the therapist's empathy/understanding was 6.28 ($SD = .65$), while the average score for the spirit of MI was 6.17 ($SD = .72$). Both mean scores meet the beginning proficiency benchmark of 5. The total-reflections-to-total-questions ratio, averaged across both raters, was 1.22, exceeding the established benchmark of 1. The overall percent of open-ended questions versus closed-ended questions was 88.9%, far surpassing the benchmark of 50%. The average percentage of complex reflections versus simple reflections across both raters was 41.6%, just meeting the established benchmark of 40%. Finally, analysis of the behavior counts recording MI-adherent and non-MI-adherent behaviors revealed that the average percentage of MI-adherent behaviors versus total behaviors was 91.9%, meeting the 90% benchmark established by the MITI developers (Moyers et al., 2003).

As show in Table 5 average MITI ratings of the MI sessions met or exceeded all established beginning proficiency benchmarks (Moyers et al., 2003) for beginning proficiency for administering motivational interviewing interventions. Inter-rater reliability was calculated and is ICC (3,2), representing an estimate of the reliability of the mean rating (Shrout & Fleiss, 1979). Therefore, it can be assumed that at least a

Table 5

*Treatment Fidelity: MITI (Motivational Interviewing Treatment Integrity)
Summary Variable Scores and Beginning Proficiency Benchmarks*

MITI Summary Variable	Rater #1 Scores	Rater #2 Scores	Average Rater Scores	Inter-rater Reliability <i>ICC(3,2)</i>	Beginning Proficiency Benchmarks (Moyers et al., 2003)
Global Therapist Ratings:					
- Empathy/Understanding	6.26	6.30	6.28	.762	5
- “Spirit” of MI	6.22	6.13	6.17	.738	
Reflection to Question Ratio	1.34	1.16	1.22	n/a	1
Percent Open Questions	90.4%	87.7%	88.9%	.874 / .608	50%
Percent Complex Reflections	45.3%	37.3%	41.6%	.864 / .747	40%
Percent MI-Adherent	91.5%	92.3%	91.9%	.928 / .795	90%

Note: *ICC(3,2)* is an estimate of the reliability of the mean rating (Shrout & Fleiss, 1979)

minimally adequate level or quality of the MI intervention was administered during the course of this study.

Internal Consistency

Internal consistency α (Cronbach, 1951) was computed for the following self-report and counselor-report measures employed in this study: the *Client Evaluation of Self at Intake* (CESI), the *Client Evaluation of Treatment*, and the *Counselor Rating of Client*. Results of these analyses are presented in Table 6.

Overall internal consistency α for the CESI was .915, while subscale α coefficients were .898 for *problem recognition*, .829 for *desire for help*, and .622 for *treatment readiness*. The *Client Evaluation of Treatment* measure produced an overall internal consistency α of .905. The *Counselor Rating of Client* measure showed overall internal consistency α of .783, while internal consistency α s were .690 for *rappport* and .748 for *motivation*. Internal consistency for the *self-confidence* subscale could not be calculated because it only contains a single item. All estimates of internal consistency appeared acceptable and consistent with previously established norms for these measures (Knight et al., 1994; Simpson & Chatman, 1995).

Correlational Data

Correlational data for all study variables is available in the simple Pearson product-moment correlation tables found in Appendix I.

Of particular interest were the correlations between the treatment site intake measures, the ASI and the MAST, and other data collected during the course of the study. These assessment instruments were not part of any hypothesis and thus are not included

Table 6

Summary of Internal Consistency of Study Measures

Measure	Internal Consistency α
Client Evaluation of Self at Intake (CESI)	.915
- Problem recognition	.898
- Desire for help	.829
- Treatment readiness	.622
Client Evaluation of Treatment	.905
Counselor Rating of Client	.822
- Rapport	.690
- Motivation	.748
- Self-confidence	N/A

Note: Counselor Rating of Client *Self-confidence* subscale is single item only

in the primary analyses of this study. However, the ASI and MAST are commonly employed for assessment in substance abuse treatment settings, under the assumption that they effectively describe drinking profiles, determine appropriate treatment plans, and predict treatment outcomes. Therefore, some observations regarding their potential clinical utility is warranted.

Correlational data for the ASI revealed that higher ASI scores (indicated in parentheses) appear to be associated with gender (i.e., being male is associated with more drug, legal, and psychiatric problems), longer time lapse between offense and intake (employment and drug problems), higher treatment readiness and motivation at baseline (employment, alcohol, drug, social and psychiatric problems), increased alcohol consumption at both baseline and follow-up (employment, alcohol, drug and legal problems), number of positive UAs while enrolled in treatment (employment and drug problems), and higher MAST scores (medical, employment, social and psychiatric problems). Correlational data for the MAST revealed that increased scores in the problem drinker category were associated with total number of DUIs (i.e., recidivism), increased alcohol consumption at baseline (per TLFB scores), and higher ASI scores. A summary table of the specific correlations is available in Appendix I.

Primary Analyses

A summary of the descriptive statistics of the outcome variables collected at 3-month follow-up, both for the total sample and separately for the MI group and C groups, can be found in Table 7. These descriptive statistics include the frequency distributions for all categorical variables and the means, standard deviations (*SD*), skewness, and kurtosis for all continuous variables. [Skewness and kurtosis measures are Fisher's g_1

Table 7

Means (M), Standard Deviations (SD), Skewness, Kurtosis, or Frequencies (f) of Outcome Measures of the DUI-offender sample obtained at 3-month follow-up

Outcome Measure	Total (N=98)		MI (n=48)		Control (n=50)	
	M (SD)	f (%)	M (SD)	f (%)	M (SD)	f (%)
<u>Treatment Engagement</u>						
Retention: treatment status						
Still attending treatment		85 (86.7%)		41 (85.4%)		44 (88.0%)
No longer attending		13 (13.3%)		7 (14.6%)		6 (12.0%)
Duration 1: total no. of missed treatment sessions	2.06 (1.850)		1.67 (1.826)		2.44 (1.809)	
	1.067		1.330		1.006	
	1.070		1.713		1.214	
Duration 2: total no. of sessions possible to attend	10.80 (1.899)		10.88 (1.794)		10.72 (2.011)	
	-1.488		-0.197		-2.376	
	5.362		0.562		8.313	
Duration 3: total no. of treatment sessions attended	8.73 (2.757)		9.21 (2.509)		8.28 (2.928)	
	-1.231		-1.596		-0.984	
	1.252		2.692		0.680	
Compliance 1: total no. of positive UAs	0.36 (1.077)		0.44 (1.287)		0.28 (0.834)	
	4.904		4.741		4.262	
	29.175		26.150		21.387	
Compliance 2: at least one positive UA						
At least one positive UA		18 (18.4%)		10 (20.8%)		8 (16.0%)
No positive UAs		80 (81.6%)		38 (79.2%)		42 (84.0%)
<u>Treatment Participation</u>						
Client's evaluation of treatment	38.76 (8.686)		40.06 (7.513)		37.50 (9.588)	
	-0.483		-0.272		-0.422	
	-0.328		-0.419		-0.642	
Counselor evaluation: Self-Confidence	3.292 (0.586)		3.400 (0.536)		3.188 (0.617)	
	0.010		0.131		0.063	
	-0.343		-0.446		-0.354	
Counselor evaluation: Motivation	3.434 (0.784)		3.542 (0.766)		3.330 (0.796)	

	-0.422	-0.717	-0.174
	-0.396	0.228	-0.604
Counselor evaluation:	3.361	3.442	3.284
Rapport	(0.597)	(0.578)	(0.610)
	-0.182	-0.693	0.261
	0.243	0.689	0.501
<u>Drinking Behaviors</u>			
TLFB: no. days since last drink	220.59 (470.205)	194.21 (349.428)	245.92 (564.996)
	5.233	3.455	5.223
	34.048	12.560	31.206
TLFB: longest period of abstinence	24.28 (8.848)	25.06 (8.640)	23.52 (9.065)
	-1.132	-1.420	-0.924
	-0.370	0.398	-0.808
TLFB: no. continuous days drinking	0.46 (0.720)	0.40 (0.676)	0.52 (0.762)
	1.412	1.474	1.369
	1.092	0.867	1.230
TLFB: total no. days drinking	1.19 (2.181)	1.06 (2.128)	1.32 (2.245)
	2.121	2.224	2.097
	4.184	4.273	4.597
TLFB: total standard drinks	3.96 (7.791)	3.08 (2.302)	4.80 (8.471)
	2.297	1.822	1.849
	4.896	2.275	2.450
TLFB: most drinks in single day	1.66 (2.799)	1.25 (2.302)	2.06 (3.178)
	1.604	1.822	1.366
	1.456	2.275	0.600

Notes: Coefficients of skewness (g_1) and kurtosis (g_2) were computed using Fisher's K statistics ($k_2, k_3, & k_4$)
Participation levels of client in treatment/therapy as measured by *Counselor Rating of Client* at 3-month follow-up
TLFB (Timeline Follow-Back) procedure is therapist-assisted self-report procedure assessing alcohol intake during a 30-day period leading up to 3-month follow-up

and Fisher's g_2 , respectively, and can be interpreted as z scores, (Fisher, 1930).] Source tables of the results of the general linear mixed model analyses of the primary outcome variables can be found in Tables 8-15. For the interested reader, means for the MI and C groups are also reported in these tables, even if the effect isn't significant. Regression analyses present exponentiated means, where the model analyzed the logs of the observations, as well as model-derived means, where means were estimated from the parameter estimate obtained from the analyses.

Treatment engagement: Retention. Treatment retention was measured by classifying each offender's program enrollment status at 3-month follow-up into one of two categories: *still attending treatment* or *no longer attending treatment sessions* (see Table 7). Overall, 85 (86.7%) of participants were still attending treatment sessions at 3-month follow-up. Within the treatment conditions, 41 (85.4%) of MI group and 44 (88.0%) of C group participants were still attending treatment sessions.

The difference between the groups on this variable was not significant [$F(1, 83) = .26, p = .61$], as shown in Table 8-A. Similarly, the effects for recidivist status, the motivational scales, age, and days between offense and intake were also not significant (all $ps > .23$).

Treatment engagement: Duration. The duration of treatment engagement was measured by the total number of treatment session that each participant attended during the initial 3 months of treatment (see Table 7). The entire sample attended an average of 8.73 appointments ($SD = 2.76$).

The model-derived mean for the C group was 8.05 ($SEM = .31$) and for the MI group was 8.70 ($SEM = .32$), which were not significantly different [$F(1, 82) = 2.44, p =$

Table 8-A

Source Table for Retention (Participant's treatment status at 3-month follow-up)

Effect	<i>df</i>	<i>F</i>	<i>p</i>
Group assignment	1, 83	.26	.609
Recidivist status	1, 83	.22	.639
Group assignment X recidivist status	1, 83	.19	.668
<u>Motivation scale as a set</u>	3, 83	1.13	.343
Motivation: problem recognition	1, 83	.43	.512
Motivation: treatment readiness	1, 83	1.46	.231
Motivation: desire for help	1, 83	.16	.693
Age	1, 83	.86	.355
Days between offense and intake	1, 83	.13	.720

Table 8-B

Estimates (b), Standard Errors (SE), Odds Ratios and their 95% Confidence Intervals (CI) for Retention (Participant's treatment status at 3-month follow-up)

Group assignment	<i>b</i>	<i>SE</i>	Odds Ratio	95% <i>CI</i> for Odds Ratio
Control group	-2.2378	.5492	.107	.036, .318
MI group	-1.8803	.4818	.153	.059, .398

Table 9-A

Source Table for Duration (Total number of treatment sessions attended)

Effect	<i>df</i>	<i>F</i>	<i>p</i>
Group assignment	1, 82	2.44	.112
Recidivist status	1, 82	.42	.520
Group assignment X recidivist status	1, 82	.63	.429
Motivation: problem recognition	1, 82	2.75	.101
Motivation: treatment readiness	1, 82	1.15	.286
Motivation: desire for help	1, 82	1.24	.269
Age	1, 82	.05	.818
Days between offense and intake	1, 82	.07	.793
Duration: total number of possible sessions to attend	1, 82	87.05	<.001

Table 9-B

Estimates (b) and their respective Standard Errors (SE), together with Model-derived exponentiated Means (M) and their respective Standard Errors (SEM) for Duration (Total number of treatment sessions attended)

Group assignment	<i>b</i>	<i>SE</i>	<i>M</i>	<i>SEM</i>
Control group	2.0863	.0384	8.0547	.3095
MI group	2.1639	.0373	8.7048	.3248

.11] (see Table 9-A). The total number of possible sessions that the participant might have attended during the initial 3 months of treatment was included in the regression analysis of this outcome variable as an additional control variable. As expected, this variable significantly predicted total number of treatment sessions attended [$F(1, 82) = 87.05, p < .001$]. No other effects were found to be significant (all $ps > .10$).

Treatment engagement: Compliance. Compliance was measured by the number of positive urine test results that the participant had while being randomly screened during the initial 3 months of the treatment program (see Table 7). The mean number of positive urine test results in the total sample was .36 ($SD = 1.08$).

As shown in Table 10-A, the treatment effect was not significant [$F(1, 83) = .70, p = .40$]. The estimated model-derived exponentiated mean for the C group was .22 ($SEM = .12$) and for the MI group was .36 ($SEM = .17$). No other effects in the model were significant (all $ps > .08$).

Treatment participation: Self-evaluation. On the self-evaluation measure of treatment participation (*Client's Evaluation of Treatment*, see Methods section), offenders assessed their active participation level while enrolled in the treatment program (see Table 7). The overall sample mean score on this measure was 38.76 ($SD = 8.69$). When contrasted with mean scores of other outpatient substance abuse treatment populations on this measure ($M = 40.6, SD = 5.2$; see Joe, Broome, Rowan-Szal, & Simpson, 2002), this sample appears to exhibit a slightly lower but comparable level of treatment participation.

The treatment groups did not differ [$F(1, 83) = 1.81, p = .18$] on this variable (see Table 11-A). The model-derived least squares mean (see Table 11-B) for the MI group

Table 10-A

Source Table for Compliance (Total number of positive UAs during initial 3 months)

Effect	<i>df</i>	<i>F</i>	<i>p</i>
Group assignment	1, 83	.70	.404
Recidivist status	1, 83	3.15	.080
Group assignment X recidivist status	1, 83	.01	.910
<u>Motivation scale as a set</u>	3, 83	.72	.544
Motivation: problem recognition	1, 83	.16	.693
Motivation: treatment readiness	1, 83	.90	.346
Motivation: desire for help	1, 83	.11	.736
Age	1, 83	.43	.516
Days between offense and intake	1, 83	1.47	.229

Table 10-B

Estimates (b) and their respective Standard Errors (SE), together with Model-derived exponentiated Means (M) and their respective Standard Errors (SEM) for Compliance (Total number of positive UAs during initial 3 months)

Group assignment	<i>b</i>	<i>SE</i>	<i>M</i>	<i>SEM</i>
Control group	-1.4926	.5398	.2248	.1213
MI group	-1.0335	.4791	.3558	.1705

Table 11-A

Source Table for Treatment Participation (Client's self-evaluation of treatment)

Effect	<i>df</i>	<i>F</i>	<i>p</i>
Group assignment	1, 83	1.81	.182
Recidivist status	1, 83	.20	.654
Group assignment X recidivist status	1, 83	.61	.439
<u>Motivation scale as a set</u>	3, 83	1.59	.199
Motivation: problem recognition	1, 83	.13	.719
Motivation: treatment readiness	1, 83	.11	.741
Motivation: desire for help	1, 83	.94	.336
Age	1, 83	.38	.540
Days between offense and intake	1, 83	.75	.390

Table 11-B

Model-derived Least Squares Means (M) and their Standard Errors (SE) for Treatment Participation (Client's self-evaluation of treatment)

Group assignment	<i>M</i>	<i>SE</i>
Control group	37.4949	1.2458
MI group	39.8952	1.2572

was 39.89 ($SE = 1.26$), while the estimated mean for the C group was 37.95 ($SE = 1.25$). No other effect in the model was significant (all $ps > .18$).

Treatment participation: Self-Confidence. The first of the three subscale scores calculated from the *Counselor's Rating of Client Participation* is the Self-confidence subscale. Results of analyses on this variable are found in Tables 12-A and 12-B. The total sample mean score on this scale was 3.29 ($SD = .59$). The estimated least squares mean for the MI group was 3.45 ($SE = .17$) and for the C group was 3.21 ($SE = .17$).

Treatment Group means were found to be significantly different [$F(1, 83) = 6.09$, $p = .02$]. Moreover, the Treatment Group X Recidivist Status interaction was also significant [$F(1, 83) = 4.34$, $p = .04$]. Simple main effects tests of the Treatment Group X Recidivist Status interaction indicated that the C group first-time offenders ($M = 3.26$, $SE = 0.18$) did not differ from C group recidivists ($M = 3.17$, $SE = 0.19$), $F(1, 83) = .40$, $p > .5$]. In contrast, MI group first-time offenders ($M = 3.29$, $SE = 0.18$) did differ from MI group recidivists ($M = 3.62$, $SE = 0.18$), $F(1, 83) = 5.27$, $p < .03$.

The Motivation scales as a set predicted Self-confidence [$F(3, 83) = 5.29$, $p = .003$], as well as the specific Motivation scales of Problem Recognition [$F(1, 83) = 6.04$, $p = .02$] and Desire for Help [$F(1, 83) = 14.06$, $p < .001$]. The estimated b weight for Problem Recognition was $-.024$ ($SE = .010$) and for Desire for Help was $.040$ ($SE = .011$). These estimates indicate that as Problem Recognition increases Self-confidence decreases, while, conversely, as Desire of Help increases, self-confidence likewise increases. No other effects were significant (all $ps > .25$).

Table 12-A

Source Table for Client Participation (Self-confidence scale)

Effect	<i>df</i>	<i>F</i>	<i>p</i>
Group assignment	1, 83	6.09	.016
Recidivist status	1, 83	1.34	.250
Group assignment X recidivist status	1, 83	4.34	.040
<u>Motivation scale as a set</u>	3, 83	5.29	.003
Motivation: problem recognition	1, 83	6.04	.016
Motivation: treatment readiness	1, 83	.96	.331
Motivation: desire for help	1, 83	14.06	<.001
Age	1, 83	.44	.508
Days between offense and intake	1, 83	.23	.632

Table 12-B

Model-derived Least Squares Means (M) and their Standard Errors (SE) for Client Participation (Self-confidence scale)

Group assignment	<i>M</i>	<i>SE</i>
Control group	3.2144	.1686
MI group	3.4560	.1685

Table 12-C

Group Assignment X Recidivist Status Interaction Least Squares Means (M) and their Standard Errors (SE) for Client Participation (Self-confidence scale)

Group assignment	Recidivist status	<i>M</i>	<i>SE</i>	<i>df</i>	<i>t</i>	<i>p</i>
Control group	First-time offender	3.2602	0.1792	83	18.20	<.0001
Control group	Recidivist	3.1686	0.1875	83	16.90	<.0001
MI group	First-time offender	3.2913	0.1824	83	18.04	<.0001
MI group	Recidivist	3.6207	0.1839	83	19.69	<.0001

Treatment participation: Motivation. The second subscale from the *Counselor's Rating of Client Participation* is the Motivation subscale. Data from Table 7 indicate that the total sample's mean score on this scale was 3.43 ($SD = .78$). The estimated least squares means and standards errors for the treatment groups are found in Table 13-B (C group: $M = 3.33$, $SE = .11$; MI group: $M = 3.53$, $SE = .11$).

The treatment groups did not differ significantly [$F(1, 83) = 1.51$, $p = .220$] on this variable (see Table 13-A) and all other effects in the model were similarly non-significant (all $ps > .22$).

Treatment participation: Rapport. The final counselor evaluation subscale in the *Counselor's Rating of Client Participation* is the Rapport subscale. The mean scores for the total sample was 3.36 ($SD = .60$), as show in Table 7. The estimated least squares mean was 3.30 ($SE = .09$) for the C group and was 3.47 ($SE = .09$) for the MI group (see Table 14-B).

The treatment groups were not significantly different from each other on Rapport [$F(1, 83) = 1.86$, $p = .176$], as shown in Table 14-A. No other effects were significant (all $ps > .08$).

Timeline Follow-back: Total number of standard drinks. The single behavioral variable used to capture each participant's general drinking behaviors during the 30 days leading up to assessment was the number of total standards drinks consumed during that period (see Table 7). The total sample in this study averaged drinking 3.96 standard drinks ($SD = 7.79$) during the 30 days leading up to follow-up. Interpretation of these results should take account of the results of earlier analyses that established baseline non-differences on this variable.

Table 13-A

Source Table for Client Participation (Motivation scale)

Effect	<i>df</i>	<i>F</i>	<i>p</i>
Group assignment	1, 83	1.51	.220
Recidivist status	1, 83	.20	.658
Group assignment X recidivist status	1, 83	.61	.436
<u>Motivation scale as a set</u>	3, 83	.87	.461
Motivation: problem recognition	1, 83	.07	.785
Motivation: treatment readiness	1, 83	1.35	.249
Motivation: desire for help	1, 83	.74	.392
Age	1, 83	.26	.612
Days between offense and intake	1, 83	1.56	.216

Table 13-B

Model-derived Least Squares Means (M) and their Standard Errors (SE) for Client Participation (Motivation scale)

Group assignment	<i>M</i>	<i>SE</i>
Control group	3.3279	.1134
MI group	3.5282	.1144

Table 14-A

Source Table for Client Participation (Rapport scale)

Effect	<i>df</i>	<i>F</i>	<i>p</i>
Group assignment	1, 83	1.86	.176
Recidivist status	1, 83	.04	.835
Group assignment X recidivist status	1, 83	1.21	.275
<u>Motivation scale as a set</u>	3, 83	1.15	.332
Motivation: problem recognition	1, 83	.84	.362
Motivation: treatment readiness	1, 83	.61	.437
Motivation: desire for help	1, 83	3.07	.084
Age	1, 83	.13	.721
Days between offense and intake	1, 83	.07	.795

Table 14-B

Model-derived Least Squares Means (M) and their Standard Errors (SE) for Client Participation (Rapport scale)

Group assignment	<i>M</i>	<i>SE</i>
Control group	3.2977	.0945
MI group	3.4663	.0947

Table 15-A

Source Table for Timeline Follow-back (Total number of standard drinks during past 30 days)

Effect	<i>df</i>	<i>F</i>	<i>p</i>
Group assignment	1, 82	2.69	.105
Recidivist status	1, 82	.17	.680
Group assignment X recidivist status	1, 82	.09	.768
<u>Motivation scale as a set</u>	3, 82	.19	.903
Motivation: problem recognition	1, 82	.01	.929
Motivation: treatment readiness	1, 82	.51	.475
Motivation: desire for help	1, 82	.09	.766
Age	1, 82	1.25	.268
Days between offense and intake	1, 82	2.49	.119
Baseline Timeline Follow-back (Total number of standard drinks)	1, 82	64.38	<.001

Table 15-B

Estimates (b) and their respective Standard Errors (SE), together with Model-derived exponentiated Means (M) and their respective Standard Errors (SEM) for Timeline Follow-back (Total number of standard drinks during past 30 days)

Group assignment	<i>b</i>	<i>SE</i>	<i>M</i>	<i>SEM</i>
Control group	1.3658	.3313	3.9188	1.2982
MI group	.7923	.3734	2.2085	.8247

As shown in Table 15-A, the regression analyses revealed that the treatment groups were not significantly different [$F(1, 82) = 2.69, p = .105$]. The estimated model-derived exponentiated means and standard error of the exponentiated means for the treatment conditions are reported in Table 15-B (C group: $M = 3.92, SEM = 1.30$; MI group: $M = 2.21, SEM = .82$).

The total number of standard drinks consumed by the participant during the 3 months leading up to treatment intake was included in the regression analysis of this outcome variable as an additional control variable. As expected, this variable significantly predicted total number of standard drinks [$F(1, 82) = 64.38, p < .001$; model-derived exponentiated $b = 1.06, SE = .01$], indicating that an increase of one standard drinks at baseline is associated with an increase of 1.06 total number of standard drinks consumed at 3-month follow-up. No other effects approached significance (all $ps > .10$).

Secondary Analyses

Additional regression analyses were conducted to examine two more models that seemed to warrant further investigation. Similar general linear mixed model procedures were conducted for these models, and all source tables of the results of these secondary analyses can be found in Appendices J and K. Also included in these analyses were the following secondary outcome variables: *duration 1* (total number of treatment sessions missed), *compliance 2* (categorical variable of at least positive UA versus no positive UAs), *TLFB 1* (total number of days since last drink), *TLFB 2* (longest period of abstinence in days), *TLFB 3* (most number of continuous drinking days), *TLFB 4* (total number of days drinking), and *TLFB 6* (most number of drinks in a single day).

Primary Drug Problem Variable Added to Model

The first alternative model that appeared appropriate for further inquiry involved controlling for one additional descriptive variable: *primary drug problem*. This categorical variable was generated from the intake assessment of each DUI offender, at which time the treatment site counselors would classify each potential client into one of the following two categories: *primarily alcohol* or *co-morbid with drug*. See Table 3 in the Results section of for a summary of the frequencies for this variable ($n = 70$ for *primarily alcohol*; $n = 18$ for *co-morbid with drug*).

Results of the analyses that included this additional dichotomous predictor revealed that the effect for the new predictor, *primary drug problem*, was not significant for any primary or secondary outcome measures. However, one of the findings reported as non-significant in the primary analyses of the original model now emerged as significant with the inclusion the new predictor: *compliance I* (i.e., number of positive UAs during the initial three months of treatment). As shown in Table 20 (Appendix J), the effect for recidivist status [$F(1, 82) = 4.06, p = .047$] was significant, indicating that recidivists ($M = .58; SEM = .24$) were less compliant than first-time offenders ($M = .16; SEM = .10$).

No other findings from the primary analyses changed as a result of inclusion of the *primary drug problem* predictor variable in the model (see Appendix J). However, significant results were found for one secondary outcome variable that was not included in the primary analyses: total number of days since last drink (see Table 26-A in Appendix J). Results from this analysis revealed that baseline motivation for treatment, including *problem recognition* [$F(1, 82) = 15.52, p < .001$] and *desire for help* [$F(1, 82) =$

12.50, $p < .001$], as well as client age [$F(1, 82) = 10.33, p = .002$] and time lapse between offense and intake [$F(1, 82) = 99.95, p < .001$], were associated with number of days since last drink, as measure by the TLFB. No other effects were significant (all $ps > .05$) (see Table 26-B in Appendix J). The estimated b weight for *problem recognition* was .090 ($SE = .023$) and for *desire for help* was -.090 ($SE = .025$). These estimates indicate that as initial *problem recognition* increases then the number of days since last drink decreases, while, conversely, as baseline level of *desire of help* increases, the number of days since last drink likewise increases. The estimated b weight for client age was -.033 ($SE = .010$) and for time lapse between offense and intake was -.001 ($SE = .001$). These estimates indicate that as client age increases then the number of days since last drink decreases, while, on the other hand, as time lapse between offense and intake increases, the number of days since last drink likewise increases.

Sample Reduced to Participants Enrolled within 180 Days of Offense

The second alternative model tested in the secondary analyses limited the number of participants to those DUI offenders who had reported for treatment intake within 180 days of their most recent DUI offense. As Table 3 reveals, a number of participants experienced significant delays between offense and entrance into treatment for significant number of the client. Therefore, it was decided that closer examination of the subset of offenders who had more recently entered treatment would be warranted. Because of the reduction in sample size and attendant lost of power in the resulting analyses, no specific hypotheses were offered.

Because the range on the time lapse since most recent DUI offense was extremely large, setting the threshold at 6 months still allowed for a sample size of only 54 subjects.

The *primary drug problem* variable was also included in the statistical model for the analyses in this reduced sample.

In order to understand possible differences between relatively “recent” and non-recent” offenders, preliminary tests (see Table 32 in Appendix K) were conducted to compare the “recent” offender (i.e., less than 180 days from offense to intake; $n = 54$) and “non-recent” offender ($n = 44$) groups on both variables used primarily for descriptive purposes as well as on the treatment outcome variables. Results for the baseline measures of problem severity (i.e., MAST and ASI) revealed that the two groups were significantly different on the ASI: Medical [$F(1, 94) = 4.50, p = .037$; “recent” least squares $M = .162, SD = .020$; “non-recent” least squares $M = .219, SE = .018$] and ASI: Legal [$F(1, 94) = 24.97, p < .001$; “recent” least squares $M = .122, SE = .030$; “non-recent” least squares $M = .319, SE = .026$]. Although not significant, the means of these two groups on the ASI: Psychiatric should be noted [$F(1, 94) = 3.73, p < .057$; “recent” least squares $M = .039, SE = .016$; “non-recent” least squares $M = .081, SE = .014$].

The two groups also differed on the following treatment outcome measures: retention status [$F(1, 96) = 5.37, p = .023$; “recent” $f = 94.4\%$, “non-recent” $f = 77.3\%$], total number of treatment sessions missed [$F(1, 96) = 4.07, p = .047$; “recent” $M = 1.80, SD = 1.81$; “non-recent” $M = 2.39, SD = 1.87$], total number of positive urinalyses [$F(1, 96) = 7.32, p = .008$; “recent” $M = .20, SD = .53$; “non-recent” $M = .55, SD = 1.49$], counselor rating of motivation [$F(1, 96) = 6.15, p = .015$; “recent” $M = 3.61, SD = .77$; “non-recent” $M = 3.22, SD = .76$], number of days since last drink [$F(1, 96) = 8414.13, p < .001$; “recent” $M = 83.83, SD = 70.85$; “non-recent” $M = 388.43, SD = 663.51$], and

most drinks in a single day [$F(1, 96) = 7.20, p = .009$; “recent” $M = 1.98, SD = 3.11$; “non-recent” $M = 1.27, SD = 2.34$].

See Tables 33-47 in Appendix K for results of the regression analyses examining treatment outcome in the recent offenders ($n = 54$). Several findings reported as non-significant in the primary analyses changed as a result of excluding clients who did not report for treatment within 180 days of their last offense, still including the *primary drug problem* predictor. In terms of the primary outcome variables, these analyses revealed one or more significant effects for *treatment participation (self-confidence)* (see Table 39), *treatment participation (rapport)* (see Table 41), and *timeline follow-back (total number of standards drinks consumed)* (see Table 46).

For *treatment participation (self-confidence)*, results were significant results for recidivist status [$F(1, 38) = 4.15, p = .049$], indicating a difference between recidivists ($M = 3.50, SE = .21$) and first-time offenders ($M = 3.22, SE = .19$) in this area of treatment participation, and days between offense and intake [$F(1, 38) = 7.34, p = .010$], suggesting that clients that report for treatment sooner after their offense exhibit higher self-confidence in their treatment participation. Moreover, results also indicated that the group assignment X recidivist status interaction found to be significant in the primary analyses was no longer significant in the present analyses [$F(1, 38) = 1.45, p = .237$].

For the variable *treatment participation (rapport)*, the group assignment effect, non-significant in the primary analyses, emerged as significant [$F(1, 38) = 5.18, p = .029$], indicating that the C group and MI group differed in level of therapeutic rapport that they developed during the initial 3 months of participation in treatment. The

estimated least squares mean for the MI group was 3.74 ($SE = .18$) and for the C group was 3.34 ($SE = .18$).

In assessing offender drinking behavior at follow-up, as measured by the TLFB variable *total number of standards drinks consumed*, results for the predictor recidivist status [$F(1, 37) = 4.89, p = .033$], indicated that recidivists ($M = 2.71, SEM = 1.19$) and first-time offenders ($M = .84, SEM = .42$) differed significantly in terms of the total number of drinks consumed during the 30 days prior to 3-month follow-up data collection. This finding was also not significant in the primary analyses.

One additional significant result was found for the alternative outcome variable *compliance 2*, a categorical variable that distinguished between clients with at least one positive UA and clients who no positive UAs during the initial three months of treatment. (See Table 5 for the frequency data for this variable.) This variable was not evaluated in the primary analyses. As show in Table 37, the effect for recidivist status [$F(1, 38) = 4.36, p = .044$] was significant, indicating that recidivists and first-time offenders differ significantly in level of treatment compliance, as defined by this variable. The odds ratio associated the recidivist effect was 19.9 (95% *CI*: 1.3, 297.3), indicating that repeat offenders were almost 20 times more likely than first offenders to have at least one positive urine test during the first three months of treatment.

CHAPTER 6: DISCUSSION

Overview

DUI offenders, a fairly heterogeneous substance-abusing population, differ in their motivation for alcohol use, in their specific drinking behaviors, and in their incentives and goals to pursue treatment (Caviola & Wuth, 2002). Although this diversity of characteristics suggests a need to address numerous issues in the research and clinical literature with this population, a major issue for mental health professionals working with this population revolves around their “coerced treatment”. The seemingly involuntary nature of their participation in treatment appears to have a negative effect on their motivation to change (Ginsberg et al., 2002), leading to increased resistance to treatment methods, low engagement or participation in treatment, and, consequently, high recidivism rates (Nochajski, 1999; Nochajski, Miller, Wieczorek, & Whitney, 1993; Nochajski & Walter, 1998).

More specifically, DUI offenders view treatment as having a high cost and a low benefit (Wieczorek, Callahan, & Morales, 1997), express ambivalence about any substantial benefit for change, and generally view their participation in treatment as a result of a single event, the DUI offense, and not as a result of problematic behaviors related to alcohol consumption. As is the case with other offenders referred or mandated to treatment by the criminal justice system (Farabee, Pendergast, & Anglin, 1998), DUI offenders’ lack of internal motivation for change appears to be the underlying issue both directly and indirectly related to poor treatment outcomes (Ginsberg et al., 2002).

Research with DUI offenders has focused primarily on the issue of recidivism, which has been the major legal objective of “rehabilitating” these offenders. Only

limited research efforts have been made to examine some of the underlying treatment and clinical issues in DUI offenders that may be linked to recidivism; the most potentially salient being the issue of low internal motivation for change. Specific clinical interventions that focus on improving DUI offender engagement and participation through increased motivation for change warrant closer examination, based not only on the findings of the present study but a supporting body of empirical literature as well (Ginsberg et al., 2002; see also Ferguson, 1998; Nochajski & Stasiewicz, 2002; Nochajski, Stasiewicz, & Gonzalez, 2000; Stein & Lebeau-Craven, 2002).

Theoretically, MI is a therapeutic tool that would target and potentially address this treatment motivation issue in DUI offenders (Miller & Rollnick, 2002). Demonstrated to be successful with other alcohol-abusing populations (Allsop et al., 1997; Miller et al., 1988, 1993, 1999; Sellman et al., 2001), as well as other substance-abusing population in outpatient treatment (Lincourt et al., 2002; Longshore et al., 1999; Saunders et al., 1995; Schneider et al., 2000), MI should effectively supplement established clinical strategies that are effective with these other populations, as well as improve outcomes by restoring some of the offender's control over the treatment process that is often perceived as lost in the more coercive aspects of the treatment process, for DUI offenders.

Unfortunately, there has been very little empirical research examining the use of MI with DUI offenders. Thus, the purpose of this study was to determine the feasibility and appropriateness of implementing motivational enhancement strategies with what is generally considered to be a low-motivation substance-abusing population. Although motivational enhancement approaches to treatment have only received preliminary

attention in the context of outpatient treatment programs for DUI offenders, these studies do advise that further research is warranted (Ferguson, 1998; Nochajski & Stasiewicz, 2002; Nochajski, Stasiewicz, & Gonzalez, 2000; Stein & Lebeau-Craven, 2002).

Compared to these previous studies of the impact of MI on DUI offenders, the present research is unique because it examined more specific treatment issues, process variables, and treatment outcomes in a sample of DUI offenders in outpatient treatment at a single clinic. Moreover, this study employed a substantially larger sample size ($N = 98$) than in previous studies examining MI and DUI offenders, and utilized a fully-randomized clinical trial method comparing an experimental and a control group. Consequently, this study offered a more in-depth examination of the impact of MI on treatment process, as well as a variety of outcome variables, with DUI offenders.

Generally, the study was conducted as planned with few obstacles to data collection or implementation of the clinical intervention. In fact, outside of a small amount of missing data related to ASI and MAST scores not available in client files, baseline and follow-up data on all other measures for the entire sample were collected. Given the myriad of potential obstacles that researchers often face in collecting follow-up data from subjects in the field, this pleasantly surprising outcome contributes to the strength of the study's results.

However, one of the most salient, and somewhat unanticipated, issues to arise in the present study was the extended delay in seeking treatment for a number of participants in this sample (i.e., the wide range in the length of time that has elapsed between the offenders' most recent DUI offense and their intake for DUI treatment). This issue appeared to deserve additional consideration in the interpretation of the results

and, ultimately, influenced the decision to conduct secondary analyses examining possible differences between “recent” and “non-recent” offenders seeking treatment. The significant results from these additional analyses contributed valuable data to the results of this study by identifying important directions for future research, as well as additional considerations in the assessment and treatment of DUI offenders.

A summary of the findings from baseline measures and both the primary and secondary analyses is presented in the next section. A discussion of the implications of these results follows. Finally, the limitations of the study and directions for future research are discussed.

Summary of Primary Findings

Baseline measures. Descriptive data of this sample indicate that the participants were assigned at random to the two treatment conditions. Across all demographic and baseline variables examined in this study, there were no significant group differences between the MI group and C group. Therefore, it appears that random assignment of participants to the two treatment conditions was successful. Moreover, distribution of participants across treatment site and counselor appears to accurately reflect the population’s distribution across the study’s treatment sites.

Overall, the cohort of DUI offenders recruited for this study appears similar to DUI offenders in the state of Maryland. In terms of most sample demographics (i.e., gender, age), recidivism, and severity or nature of drinking problem (i.e., MAST scores, ASI scores, primary substance abuse problem), this DUI offender sample also appears to represent the population of DUI offenders that seek treatment at these outpatient treatment sites, as well as the DUI offender population in general.

However, one exception to our ability to freely generalize from this sample to at least the population of Maryland DUI offenders appears to be the comparative overrepresentation of males versus females in the study sample, in comparison the general population of DUI offenders seeking treatment. Although little empirical evidence has been established regarding gender issues in the DUI offender population, interpretation of the results of this study need to be considered in light of the overrepresentation of males in the study sample compared to population estimates for the state of Maryland. For example, in the literature related to alcohol abuse, men report greater alcohol consumption and increased risk for alcohol-related problems when compared to women (Wilsnack et al., 2000).

Examination of the MAST data suggests that this sample is comparable to other DUI offender samples (Caviola, Strohmets, Wolf, & Lavender, 2003; Arria et al., 2005). Scores on the MAST in the present sample are similar to national averages for treatment-seeking alcohol abusers (Connors et al., 1992; Harris & Miller, 1990) and the percentage of offenders categorized as problem drinkers is comparable to the general Maryland DUI offender population (Arria et al., 2005). However, it appears that a higher percentage of DUI offenders can be considered *problem drinkers* when compared to criminal and inpatient populations receiving substance abuse-related treatment services (Blevins, Morton, & McCabe, 1996; Laugharne, Daniels, & Lutchman, 1997).

Findings from the ASI suggest that DUI offenders may, in fact, be experiencing fewer problems in various aspects of their lives than other clients in treatment who have been identified with alcohol-abusing problems. Compared to other substance-abusing populations in treatment (Reiber & Parent, 2000; Block, Bates & Hall, 2003), the present

sample appears to exhibit comparable levels (i.e., sample scores were within $\frac{1}{2}$ *SD* of other samples) of legal, medical and employment problems, but less severe problems in the social and psychiatric aspects of their lives (i.e., sample scores were 1.5 to 2 *SDs* below other samples on these scales). Alcohol problems appear to be more severe (i.e., sample score was $\frac{1}{2}$ *SD* higher) than other substance-abusing samples (Reiber & Parent, 2000), but less severe (i.e., sample score was 2+ *SDs* lower) than other alcohol-abusing samples in treatment (Block, Bates & Hall, 2003).

An issue to consider in terms of evaluating the salient characteristics of this sample is the possibility of co-morbid psychopathology among these offenders. Although some researchers and clinicians might reason that more careful assessment of such co-morbid conditions is warranted given some evidence that there is often a significant number of offenders who present with co-morbid psychopathology (Saltstone, 1989; McMillen et al., 1992; Vigdal et al. 1995; Wells-Parker & Williams, 2002), it appears that MI researchers have largely failed to address this potential issue when providing MI treatment. It appears that summaries of most of the MI clinic trials conducted with various treatment populations provide little insight into their process for assessing possible co-morbid conditions within in their samples (see Hettema et al., 2004), and it is therefore likely that little if any such assessment was conducted.

Despite the apparent lack of attention to this issue, consideration of incorporating a measure of psychopathology into the study might have been informative. Most states require some minimal assessment of psychopathology at intake (see Chang et al., 2002), in order to better inform treatment planning, but it appears that many treatment sites rely on secondary data, garnered from traditional substance abuse assessment instruments, to

inform them regarding psychopathology. In fact, to date, no available instrument has demonstrated accuracy to screen for both psychiatric problems and alcohol and drug misuse (Lapham et al., 2004). Therefore, it has been suggested that it may be useful to develop specialized mental health and alcohol or drug abuse screening instruments for evaluating criminal justice clients (Peters & Bartoi, 1997).

However, in the presence of co-morbid diagnoses, there is some evidence to suggest that MI can effectively improve treatment outcomes with more complicated treatment populations. More specifically, two 1998 clinical trials conducted by Daley and colleagues, as well as a 2001 study conducted by Barrowclaw and colleagues, specifically targeted dual diagnosis populations (i.e., dual psychiatric diagnoses, co-morbid cocaine dependence and depression, co-morbid substance abuse and schizophrenia), lending support to implementing MI with more clinically complex populations. Consequently, given the preliminary success of implementing MI with more clinically complex populations, future research may continue to ignore the potential impact of co-morbid diagnoses, assuming that MI interventions are robust enough to effectively address the potential influence of such issues within the target population.

As DUI offenders appear to generally have less severe alcohol problems than other alcohol-abusers, they may not be appropriate candidates for alcohol abuse treatment; or, the general DUI offender population warrants a modified intervention for their apparent alcohol abuse problems. Finally, given their criminal history and the potentially direct role of the legal system in their help-seeking behaviors, DUI offenders might have been expected to have more severe legal problems at intake than other substance-abusing populations in treatment settings. However, results indicate that DUI

offenders' legal problems are no more severe than the general alcohol-abusing population in treatment (Reiber & Parent, 2000; Block, Bates & Hall, 2003), suggesting that alcohol abusers in treatment may be experiencing more legal problems than anticipated or that DUI offenders' legal problems are not as severe as anticipated.

Concerning the accuracy of the reported DUI offenses in this study, one issue to consider is the potential impact of unreported PBJs (Probation Before Judgment) confounding the data. PBJs represent offenses that may not have lead to legal sanctions, but are nonetheless violations of the law. Many DUI offenders might not reasonably consider reporting these incidents during the intake process as no criminal record would be available to disconfirm their report. Consequently, this potential complication may be an important consideration with reportedly first-time offenders, as the instant offense may not truly be their initial offense. Therefore, the accuracy of comparisons between the first-time offenders group and reported recidivists may be confounded and such confounding may have adversely impacted group comparisons.

Another unexpected findings in this study was the relatively large number of offenders who are not seeking treatment immediately following their most recent offense (i.e., time lapse from last offense to intake was unexpectedly high for a significant number of the clients). In comparison to the DUI offender population generally (Freeman-Wilson & Huddleston, 1999; Kennedy, 1993), the present sample appears to include offenders who have waited longer-than-normal (and significantly longer in some cases) periods of time before seeking treatment and resolving their concurrent legal issues (i.e., restoring driving privileges). However, it should be noted that this finding is not entirely unusual in the state of Maryland (Arria et al., 2005) and this sample may be

guardedly compared to the specific population of Maryland DUI offenders from which is was recruited.

Additional baseline measures of *motivation for treatment* (i.e., the CESI) and drinking behavior (i.e., the TLFB) revealed that this DUI offender sample appears to be representative of the general substance-abusing population, as well as alcohol-abusing samples, on most of the variables on these measures. These results are cited and discussed below. Unfortunately, there is no specific data regarding other DUI offender populations on these measures.

More specifically, the DUI offenders in this study are comparable to the general substance-abusing population on one subscale of motivation, *problem recognition*, (Knight, Holcom, & Simpson, 1994), as well as the following drinking behaviors (Kennedy, 1993): average number of drinking days, number of most continuous drinking days, total number of standard drinks, and most drinks in a single day.

On the other hand, in terms of motivation, the DUI offenders in this study appear to have a relatively stronger *desire for help* and a higher *treatment readiness* than other substance-abusing populations in the research literature (Knight, Holcom, & Simpson, 1994). Thus, it appears that these DUI offenders are at least exhibiting some desire for help from or readiness for the treatment process, although it may not necessarily be founded on the recognition that they have a substance-abuse problem. This finding makes sense in light of the fact that DUI offenders are more likely than other alcohol-abusers to be motivated for treatment by external (i.e., legal, employment, etc.) factors rather than by internal motivation.

In terms of drinking behaviors, the offenders in this study do appear to have a notably higher number of days since last drink at the time of treatment intake, in comparison to the general alcohol-abusing populations in treatment (Kennedy, 1993). This difference appears less unexpected when taking into consideration the wide range and high variability of time that has elapsed since the most recent DUI offense for a large number of offenders in this sample. This explanation may be further strengthened by the fact that these DUI offenders were still reporting substantial levels of pre-treatment drinking behaviors, as noted above.

It might have been expected that DUI offenders entering treatment would be less likely to report specific drinking behaviors, in light of their apparent tendency to minimize their problems generally and deny that there may even be a substance abuse problem. However, this expectation was not supported by the results of this study. Consequently, because they reported considerable drinking behaviors at baseline, it was anticipated that it would more likely that analyses would reveal treatment impact.

Primary analyses. Turning first to the significant results related to the impact of the MI intervention on outcome, results of the primary analyses revealed that MI treatment had a significant effect upon only a single outcome: counselor's rating of client's *self-confidence*. The MI intervention was found to increase the perceived level of *self-confidence* that DUI offenders exhibit while participating in treatment in comparison to control group offenders. Obviously, the MI model targets an increase in this type of behavior with clients (Miller & Rollnick, 2002) and the effect was expected. However, it should be noted that the self-confidence scale includes only a single item. Further research on the impact of MI on this construct should probably include other, more

robust, measures. Nonetheless, preliminary evidence that MI increases perceptions of a client's *self-confidence* has been found in this study.

While those in the MI group demonstrated a higher level of *self-confidence* at 3-month follow-up in comparison to the control group, the treatment group by recidivist status interaction was also found to be significant. A closer examination of this interaction effect revealed that control group recidivists did not differ from control group first-time offenders in level of self-confidence, while the MI treatment group recidivists were significantly higher in counselor-rated *self-confidence* than MI group first-time offenders, at 3-month follow-up. It appears that this increase in *self-confidence* seems to more directly affect recidivists versus the first-time offenders.

This finding is of particular interest because it suggests that the potential positive impact of MI may selectively facilitate treatment efforts with recidivists. Based on the underlying principles and strategies of MI (Miller & Rollnick, 2002), this finding makes sense in light of idea that recidivists may enter treatment with more personal experience to draw upon regarding the dysfunctional nature of their drinking behaviors, whereas first-time offenders may be more in denial about the nature and extent of their drinking problems. These experiences and their impact on outcomes in the client's life are the focus of MI intervention and are the potential catalyst for increasing motivation for change. Therefore, it stands to reason that recidivists may, in fact, better benefit from such motivational enhancement techniques than do first-time DUI offenders because of the "experience" they bring to treatment.

Heretofore, no specific research has examined the impact of MI on DUI recidivists alone. The present finding suggests that there is some basis for considering

motivational enhancement techniques as a clinical intervention suitable to DUI recidivists. It may be that recidivists are more “prepared” to respond better to the MI intervention when entering (or re-entering) treatment. This finding also suggests that interventions other than MI may be more appropriate for first-time DUI offenders. At this point, there is no preliminary empirical evidence to suggest what treatment interventions might be more effective with this subset of the population, but it is strongly suggested that treatment plans and interventions for first-time DUI offenders distinct from interventions targeted to recidivists warrants consideration and development. Finally, it may also be that MI, as a supplemental component to outpatient treatment, may not be as crucial to treatment success for first-time DUI offenders. Therefore, treatment planning might be facilitated by streamlining first-time DUI offenders directly into standard group or individual interventions, while recidivists are administered specific interventions for motivational enhancement before advancing into the standard treatment programming.

Pre-treatment levels of motivation for treatment, as measured by the CESI, were also included in the regression model and were found to be significantly related to this same outcome variable of counselor’s rating of client’s *self-confidence*. Results revealed that the motivation measures as a set, as well as the specific subscales of *problem recognition* and *desire for help*, were associated with changes in this treatment outcome. However, these two motivation scales were inversely related to the counselor’s rating of client *self-confidence* at 3-month follow-up, where perception of *self-confidence* decreased as *problem recognition* increased, but, conversely, increased with increasing *desire for help*.

Because the inverse nature of these relationships was somewhat surprising, it is possible that the findings may be simply due to chance. However, some plausible explanations may be explored. Interpretation of these findings suggests that there may be several potentially important psychological phenomena that would allow a better understanding of offenders who seek treatment.

First, it appears that those offenders more likely to recognize that they may have an alcohol (or drug) abuse problem at the outset of treatment are less likely to feel confident about their ability to change their behaviors. Such an inference makes sense when considering that those offenders who deny or do not recognize any potential problems when entering treatment are more likely to demonstrate confidence in dealing with an issue (which does not even exist in their minds). Thus, their confidence would remain high as denial remains high. Similarly, as the offender minimizes any alcohol problem, he/she would naturally express more confidence in dealing with a perceived smaller, rather than a more daunting, personal issue. This finding fits with consistent findings in the empirical and clinical literature related to the denial, minimization, and rationalization patterns of alcohol abusers in treatment (see McMahon & Jones, 1992; Roizen, 1977). In fact, denial is often considered by mental health professionals to be an integral aspect of alcoholism (Flavin & Morse, 1991).

A second trend to recognize is that those offenders who approach treatment with an increased level of desire to be helped by an intervention appear more likely to acknowledge that treatment, or the interaction of treatment with their own abilities, is going to be successful. It reasons that increased desire for help on the part of the offender would also reflect in behaviors during treatment that would reflect more self-confidence

about change (i.e., higher participation, higher cooperation) than those offenders less enthusiastic about their enrollment in treatment.

However, an important consideration may be the accuracy of or tendencies in the self-report of DUI offenders, and recidivists in particular, in treatment. Baseline motivation in this study was measured through the CESI, a self-report instrument. The derived motivational scales may have been influenced by the DUI offenders' tendencies to minimize or deny any potential alcohol problem. Consequently, the accuracy of DUI offenders' self-report is often suspect (see Babor, Stephens, & Marlatt, 1987; Maisto, McKay, & Connors, 1990; Sobell & Sobell, 1990).

No other predictor variables, including age and time lapse between offense and intake, were found to be significantly related to any of the outcome measures in this study. [However, it should be noted that the baseline measures of duration and drinking behavior, included as control variables in the regression models of those specific three-month outcomes, were found to be significant as would be expected.]

Consequently, although it was hypothesized that the MI intervention would have significant impact on improving treatment motivation, participation, and retention, in addition to specific drinking behaviors, this hypothesis, within the initial model, was only weakly supported by the results for a single outcome variable.

Summary of Secondary Findings

The secondary analyses, conducted with two different modified statistical models, yielded some additional significant results related to the primary outcome variables, as well as with some additional secondary outcome measures evaluated in this study.

Modified Model 1. The first modified model included the addition of a single predictor variable to the regression model: *primary substance abuse problem*. This dichotomous predictor variable was based on the determination of a treatment site counselor at this time of intake and specified whether the offender's primary problem was either alcohol related or co-morbid with another drug(s). The relationship between this variable and any of the primary or secondary outcome variables failed to reach significance in any of the secondary analyses. However, several additional findings emerged that were related to other effects in the statistical model, as well as for the addition of secondary outcome variables which not considered in the primary analyses.

The modifications of the model contributed to only one change in the significant results found in the primary analyses. As found in the primary analyses, the treatment group main effect, the treatment group by recidivist status interaction effect, *problem recognition*, and *desire for help* continued to be significantly related to the counselor's rating of the client's *self-confidence*. However, it was also found that recidivist status was related to client's compliance with treatment (i.e., total number of positive UAs during the first 3 months of treatment), where first-time offenders were found to be more compliant (i.e., fewer positive UAs) than the recidivists recruited in the study.

This finding supports earlier findings and interpretations from the primary analyses. It also offers some insight into the differences between first-time offenders and recidivists, supporting the theory that recidivists have more severe, long-standing alcohol problems that would adversely affect treatment compliance (i.e., abstaining from alcohol while in treatment). Apparently, repeat offenders found it more difficult to abstain from drinking than those who had only committed one prior offense. This difficulty might be

due to the severity of their drinking problem, but might also be linked to maladaptive beliefs and attitudes about drinking and driving that have lead them to commit multiple offenses in the first place (Greenberg, Morral & Jain, 2004; Jain, 2005).

Significant results also were found for one secondary outcome measure, which was not included as one of the primary outcome measures: *total number of days since last drink*. Results revealed that baseline motivation for change, including *problem recognition* and *desire for help*, as well as client age and time lapse between offense and intake, were associated with number of days since the participants' last drink. More specifically, it was found that as initial *problem recognition* increased then the number of days since last drink decreased, while, conversely, as baseline level of *desire of help* increased, the number of days since last drink likewise increased. It was also found that as client age increases then the number of days since last drink decreases, while, on the other hand, as time lapse between offense and intake increases, the number of days since last drink likewise increases.

The relationship between *problem recognition* and abstinence makes a great deal of sense in that those DUI offenders who expressed less concern about a potential alcohol problem would have understandably gone longer periods of time since their last drink. However, this assumes that the offender has been forthright and accurate in their report of motivation and drinking behaviors. Those offenders who professed to not having a drinking problem (due to denial or minimization) at the time of intake may be more likely to report that they had been or continued to be abstinent at 3-month follow-up in order to remain consistent.

Explanations for the unexpected direction of the relationship between *desire for help* and abstinence are less clear and may simply be due to chance. However, it can be reasoned that those offenders who entered treatment with higher levels of *desire for help* were more likely to have remained abstinent because their desire lead to them better benefit from the treatment program. Perhaps the desire for help is focused on their need to complete treatment for legal or employment reasons rather than because they have a significant alcohol problem, which would be manifest in ability for extended abstinence.

The relationship of age and lapse of time between offense and intake with the number of days since last drink is not surprising, as this sample was found to have a relatively high percentage of offenders who appear to have waited a longer than average period of time to seek treatment (see previous discussion). Consequently, it would be expected that they are more likely to have a gone a longer time since their last drink before intake and would be older. It reasons that older offenders and those that have waited longer to seek treatment might be found to have been abstinent for longer periods of time. Therefore, these findings related to age and time lapse may be confounded. Although the correlation between these variables was not significant (.188), these findings may simply reflect that alcohol abuse is no longer such a serious problem for some older offenders or for some offenders who are finally seeking treatment after an extended period of time.

Overall, the addition of the single predictor *primary substance abuse problem* appears to contribute little additional information to our understanding of treatment with this population. Based on the relative emphasis for treatment planning that the treatment sites put on this decision at the time of intake, the failure to find any significant

relationships with the variety of outcome variables examined in this study is somewhat unexpected. Consequently, it appears that the assessment of primary substance abuse problem is of little clinical or predictive value to counselors in this setting. However, it may also be that this judgment, made at the time of intake, is not being made accurately.

Modified Model 2. In the second modified model, the sample size was reduced (to $n = 54$) to focus on the offenders who had more “immediately” sought treatment following their most recent DUI offense (i.e., 180 days or less between offense and treatment intake).

Comparison of these “recent” offenders with the “non-recent” offenders on the baseline measures of problem severity revealed that the two groups did indeed differ on two subscales of the ASI at treatment entry. Results revealed that “non-recent” offenders were higher in terms of severity of problem related to legal issues, while “recent” offenders were higher on medical-related issues. These findings suggested preliminary confirmation of the reasoning for examining the “recent” offenders separately from the “non-recent” offenders in this manner.

Comparisons between these two groups were made on the study’s primary and secondary outcome measures and revealed significant differences. Those results revealed that the “recent” and “non-recent” offenders were significantly different in terms of *treatment status* at 3 months (i.e., “recent” offenders were more likely to be still attending sessions), *total number of treatment sessions missed* (i.e., “recent” offenders missed fewer sessions), *total number of positive UAs* (i.e., “non-recent” offenders delivered more positive results), counselor’s rating of offenders *motivation* during treatment (i.e., “recent” offenders appeared to be more motivated in their treatment participation),

number of days since last drink (i.e., “non-recent” offenders had gone a longer number of days), and *most drinks in a single day* (i.e., “recent” offenders reported higher single day consumption).

It appears that “non-recent” offenders demonstrated more severe legal problems than “recent” offenders at the time of intake. This finding could be based on the fact that the long-term legal ramifications of their DUI incident had already had a personal, family, and/or social impact due to their delay in seeking treatment. More “recent” offenders would be at early stages in the legal process, anticipating that legal outcomes may not be severe or be mitigated by their efforts to seek treatment immediately following the offense. The fact that “recent” offenders exhibited more significant medical problems at intake may be due to any number of reasons, including the fact that any injuries sustained during their DUI incident would have been more likely to still be present.

It appears that “recent” offenders are more likely to miss fewer sessions and remain in treatment through in the initial weeks or months of treatment. Perhaps “non-recent” offenders’ apparent reticence to enter treatment in the first place undermines their motivation, confidence, and commitment early in the treatment process. They may have also had previous unsuccessful attempts in treatment that might also adversely affect these important treatment issues. This speculation is supported by the finding that “non-recent” offenders were rated as having lower treatment motivation after three months of intervention.

The “recent” offenders delivered fewer positive urine analyses (UAs) during the initial weeks of treatment, which might be considered as a short-term measure of

potential for recidivism. Therefore, it may be that “non-recent” offenders are more at-risk for recidivism in the long-term than are “recent” offenders.

The finding that “non-recent” offenders had gone a longer period of time since their last drink is difficult to interpret because “recent” offenders would simply have had less time to remain abstinent since their last drink, relative to their arrest date. It is possible that “recent” offenders’ drinking in a more intermittent abuse drinking pattern (i.e., continuing to drink less frequently). This might be further supported by the finding that “recent” offenders were also found to have consumed more drinks in a single day during the previous month, suggesting that are more like to binge drink within this pattern. Although binge drinking certainly puts the offenders more at risk for recidivism (Fell, 2006), the practice is also more associated with social drinking and a profile of alcohol abuse (versus alcohol dependence) which may be more descriptive of the “recent” offender population (Wechsler, Dowdall, Maenner, Gledhill-Hoyt, Lee, 1998). Consequently, “recent” offenders’ drinking behaviors may be seen as more “out of control”, while “non-recent” offenders would have had more time to establish control over their drinking habits. It may also be true that for “non-recent” offenders, circumstances leading to the arrest (i.e., prior drinking patterns, situations, and triggers) had changed or that the impact of “maturation” played a role in their discrepant drinking behaviors.

Overall, these findings suggest that there are some key differences in the characteristics and the treatment outcomes of “recent” and “non-recent” DUI offenders. Albeit that this variable was not found to be significantly related to outcomes in the primary analyses, these findings still suggest that the time lapse between offense and

treatment intake is an important research and clinical consideration when working with this population. For example, clinicians might consider that working with “non-recent” offenders may entail more focus on facilitating coping with legal stressors, may require more emphasis on compliance with treatment standards for abstinence, and may necessitate closer case management in initial months in order to avoid early treatment attrition. Researchers might consider focusing clinical trials on specific subsets of the DUI offender population based on time lapse between offense and treatment that would, in turn, would further clarify important diagnostic or treatment issues in empirical comparison of these subsets. Implications for researchers are re-visited later in this discussion.

In terms of the findings related to the sample subset of “recent” offenders, results of the regression analyses for *self-confidence* yielded additional significant results for both *recidivist status* and *time lapse* (i.e., days between offense and intake). The significant results found for treatment group and *motivation* for treatment remained unchanged from the primary analyses. However, it was also found that the treatment group by recidivist status interaction which was significant in the primary analyses, was no longer significant.

Consequently, these results suggest that “recent”, first-time offenders, and specifically those offenders that report for treatment the soonest after their DUI offense, exhibit higher self-confidence in their treatment participation and abilities to change. From a clinical perspective, treatment efforts with first-time offenders of the population of DUI offenders may be most effective by not spending unsubstantiated time with motivational enhancement and, instead, quickly harnessing the client’s increased self-

confidence toward implementing other alcohol abuse change strategies. This interpretation appears to be supported by previous findings from the primary analyses, where recidivists may particularly benefit from an intervention such as MI.

An additional significant finding revealed that *treatment group*, a variable of primary interest in this study, to be significantly associated to the counselor's rating of the client's *rapport*. More specifically, "recent" offenders in the MI group were reported to have had a higher level of therapeutic rapport than those in the control group during the initial three months of treatment.

MI targets improving the clients desire to participate more actively and cooperatively in treatment (Miller & Rollnick, 2002). A behavioral manifestation of this "improved" level of participation would be seen through the nature of the interactions that the client exhibits with others in the treatment setting. However, how this increased level of participation in treatment directly or indirectly impacts drinking behaviors is not clear.

In assessing changes in drinking behavior at follow-up, it was also found that *recidivist status* was significantly related to the total number of drinks consumed during the 30-day period prior to three-month follow-up. These results indicate that among "recent" offenders, the recidivists consumed a significantly higher number of alcoholic drinks than first-time offenders during this period. This finding is not unexpected, based on previous findings regarding the differences between recidivists and first-time offenders (see above). Moreover, in light of the findings that "recent" offenders, in comparison to "non-recent" offenders, exhibited higher levels of alcohol consumption at 3-month follow-up, it may be that recidivists who promptly seek treatment following the

offense may represent a subset of the population of recidivists that is most at-risk for continued, problematic drinking behaviors. This at-risk subset of the population might require specific treatment interventions focused on setting specific drinking goals, close monitoring of consumption, and more frequent UA testing to enforce compliance (see below).

One additional significant result was found for the relationship between *recidivist status* and the secondary, alternative measure of *compliance*, a categorical variables that distinguished between clients with at least one positive UA and those with no positive UAs during the initial three months of treatment. These results revealed that among “recent” offenders, recidivists were more likely than first-time offenders to fall into the category of having at least one positive UA. This finding supports the supposition that recidivists may be more at-risk for treatment non-compliance and continued, problematic drinking behaviors. This finding also supports the aforementioned conclusion that this subset of the population may require particular attention by treatment providers during treatment.

As in the primary analyses, no other predictor variables, including age, time lapse between offense and intake, and *primary substance abuse problem*, were found to be significantly related to the outcome measures in this study. This failure to find a relationship with time lapse is not surprising given the abbreviated length of time between offense and intake for this sub-sample. Age and *primary substance abuse problem* were also non-significant in the primary analyses, so it was not unexpected to find similar results in this model. The same baseline measures of treatment duration and

drinking behavior, included as control variables in the regression models of their respective outcome measures, were found to be significant as expected.

It is also worth noting that several results were found to be significant in the second set of secondary analyses that were declared non-significant in the primary analyses, despite having less power in the secondary analyses than was available for the primary analyses. Moreover, it is not clear why the *time lapse* variable (i.e., time lapse between offense and intake) was not significant in the primary analyses, yet dividing the sample based on this variable appeared to be justified by the findings of difference between “recent” and “non-recent” offenders. However, examination of the range and standard deviation of this variable suggests that the spread of such scores was unusually large, and thus may not have been reflective of the phenomenon of interest, which can be thought of as simply “prompt entry” versus “delayed entry” into treatment.

Implications of the Findings

The implications of the findings from this study regarding the impact of the MI intervention on treatment outcome variables suggest further research efforts in this area and a greater clinical appreciation for the diversity of DUI offenders are, indeed, warranted. However, from a research perspective, it is clear that further empirical evidence is needed before any firm conclusions can be drawn about the impact of MI on treatment outcomes in DUI offenders. Nonetheless, despite the lack of clear findings related directly to MI and outcome, the results of the research offer additional, valuable insight into the heterogeneity of the DUI offender population. The implication regarding the MI intervention and the findings regarding subsets of this population are discussed below.

The nature of the significant findings related to increases in self-confidence due to the MI intervention, as well as other predictors (i.e., recidivists), is worth some additional discussion. It is interesting to consider that self-confidence is often a client characteristic that is one of the last to develop during the therapeutic process. Client's often struggle with self-confidence about change or success until they begin to experience those events and perceive that their own self-efficacy contributed to the outcome (see Tigges, 2004). Consequently, self-confidence often increases with success. Therefore, the finding that offenders, who were given the MI intervention, exhibited higher self-confidence, with no apparent improvement in other areas, seems somewhat counter-intuitive.

However, it is possible that MI participants and recidivists convey higher levels of self-confidence due to reasons other than elevated beliefs in themselves or treatment to help them change. For example, recidivists are likely to have been involved in previous treatment programs and may exhibit a familiarity with the setting that is based more on experience than confidence. First-time offenders who are enrolling in such outpatient treatment programs for the first time may appear much more reticent and uncomfortable with their surroundings in comparison to recidivists.

It may also be that case that some offenders are more likely to convey verbal and non-verbal messages suggestive of confidence in an effort to bolster the opinions of others, particularly their counselors, regarding their motivation and behavior change. This self-report accuracy of this population is often suspect and their little doubt that efforts to portray a positive image regarding compliance and change would pervasive in all interactions in the treatment setting. This may be especially true with MI group participants who might likely perceive that their involvement in an exceptional treatment

modality should lead to improved outcomes. Special efforts may then be made to exhibit this anticipated improvement.

MI intervention. MI appears to selectively affect some treatment participation variables (i.e., *self-confidence* and *rapport*), but does not appear to clearly impact drinking behaviors, retention, or treatment compliance. Although the findings related to improved treatment participation are important, the fact remains that MI failed to demonstrate its value in impacting the major outcomes most often associated with treatment success.

Despite the lack of significant findings in the regression analyses, examination of the simple means for the two treatment groups (MI vs. control) on the outcome measures suggests that there may be basis for future research using this intervention with DUI offenders. On the majority of outcomes variables measured in this study, offenders in the MI group demonstrated a tendency toward treatment success (i.e., MI group means were greater than control group means on 12 of the 16 variables). This observed trend, taken into consideration with the significant results of some of the regression analyses, appears to offer preliminary support for continued examination of the utility of MI treatment interventions with DUI offenders. Although the empirical evidence is far from overwhelming, MI does appear to impact some important outcome variables that are either directly or indirectly associated with treatment success.

It should also be noted that although a reasonable sample size ($N = 98$) was recruited in this study, power to detect significant effect was not high. This point is particularly important given the diversity of the sample in terms of *time lapse*, recidivist status, motivation for treatment, and drinking behaviors. Thus, future research should

have larger sample sizes and define more carefully their criteria for inclusion of DUI offenders. The lack of results regarding the impact of MI with this population may also be a result of the heterogeneous nature of DUI offenders. There appears to be some basis for implementing MI with particular subsets of the population (i.e., recidivists vs. first-time offenders, “recent” vs. “non-recent” offenders). Further discussion regarding the particular subsets of this sample is found below.

Other potentially confounding issues that may have contributed to the lack of findings are: 1) the likely change in motivation by some Control group participations; and 2) the possible contamination of the group sessions because MI group participants were enrolled in the same group treatment program as the Control group participants. It reasons that some number of the Control group participants would have also improved in motivation for change or treatment through their involvement in the regular group outpatient treatment program. Whether this change was due to shifts in motivation due to factors outside of treatment or due to the indirect influence of the group treatment intervention, it remains a concern that the differential impact of the MI treatment might have been diminished by this methodological problem. The potential contamination of the group conditions may have further contributed to increases in Control group motivation and even mitigated the effects of the MI intervention for MI group participants.

From a clinical utility perspective, MI impacts treatment process variables that suggest better treatment outcomes for the client. Moreover, these treatment participation behaviors may be especially important to target in this population, where a general lack of motivation for change or treatment participation can create a climate that is not

conducive for the treatment improvement of any of the involved clients. More specifically, the climate of a group therapy setting can impact all clients positively or negatively, depending on what the general attitude and participation levels of the members might be. Therefore, improved treatment participation should improve treatment outcome variables for other clients involved in treatment (Yalom, 1995; Panman & Panman, 2001). Because MI appears to positively impact these factors in group treatment, it reasons that implementation of motivational enhancement techniques with DUI offenders is warranted for the benefit of both the individual and the group.

Another aspect of treatment process that probably deserves consideration is further evaluation of the participants' current "stage of change". As discussed previously, MI is grounded, in part, in the "stages of change" model (Prochaska & DiClemente, 1992), yet further assessment of the application of this model in the context of this study was not conducted. In fact, it may have been informative to calculate each offender's current stage of change in their motivational movement toward changing problematic drinking behaviors. It is possible that the offender's readiness for change was a mediator of the changes found in the significant results (i.e., self-confidence and rapport). Moreover, evaluation of such a potential mediating effect might have further clarified the unanticipated non-significant results. However, the availability of valid and useful measures that might accurately assess stage of change is still a concern.

These results suggest that MI, delivered prior to group treatment in as few as two sessions, may be effective in treating a subset of DUI offenders. However, modification of the format in which it is administered to this population should be considered. The quantity of MI delivered has been a topic of research, with a significant number of

clinical trials supporting the 2-session format as effective for achieving treatment goals with other populations. However, given the expected low motivation of DUI offenders entering treatment, increasing exposure to MI-related interventions may be necessary in order to more effectively impact the treatment outcomes of interest with this population. This increase in exposure might be achieved in a variety of fashions, including longer sessions, more initial sessions, the addition of booster sessions, continued emphasis on motivational enhancement during the course of group treatment, or increased proficiency in the MI therapist. Ultimately, it may be the case that a low-motivation population, such as DUI offenders, may simply need more of what MI has to offer when compared to the other treatment populations. Therefore, consideration of the dosage of the intervention deserves further consideration.

It may also be the case that the focus of the MI intervention needs to be further clarified and structured to better meet the needs of this population. As explained in the Methods section, the MI intervention in this study was administered with only general guidance toward motivation to decrease drinking behaviors. Ultimately, the focus of change-talk varied significantly across participants. MI may be more effective in treating this population if it focused on change behaviors related directly to decreased alcohol consumption or even decreased drinking and driving.

In comparing the results of this study with previous research that has examined the impact of MI with other substance-abusing populations, it should be noted that results of this study are not as clear regarding the positive impact of MI on treatment outcomes as are these other studies. As discussed in the literature review, numerous studies have established the effectiveness of MI with other alcohol-abusing populations (Allsop et al.,

1997; Bien et al., 1993; Borsari & Carey, 2000; Brown & Miller, 1993; Dench & Bennett, 2000; Marlatt et al. 1998; Miller et al, 1988). These studies all found significant findings related to the various changes in drinking behaviors, abstinence, binge episodes, and peak BAC (blood alcohol count). No such clear-cut results were found in this study. Therefore, the extent to which the DUI offenders recruited for this study are truly similar to other alcohol-abusing populations warrants consideration.

One possible perspective on this issue is that DUI offenders may more accurately represent a criminal population (versus an alcohol-abusing population) in treatment. However, MI studies examining outcomes (e.g., recidivism, drinking behaviors, abstinence, motivation for change) with other criminal substance-abusing populations demonstrated that MI can still be effective with in these populations. Several studies, examining criminal samples who were not alcohol-abusers, have indicated that MI still significantly improved treatment motivation, as well as behavioral treatment outcomes related to substance use, treatment retention, and treatment completion (e.g., Lincourt et al., 2003; Longshore et al., 1999; Saunders et al., 1995; Stotts et al., 2001). Therefore, the implications regarding the nature of the DUI offender population in MI treatment are still not clear.

The particular characteristics and treatment motivation of this sample of DUI offenders also warrants consideration. Perhaps it would be more appropriate to refer to the sample as “DUI offenders in treatment”, noting that this sample may not be at all representative of the DUI offender population at large. Essentially, these offenders may represent the “best of the worst” as they are the portion of the population that is making active efforts to comply with legal sanctions and, for the most part, treatment standards.

Moreover, these offenders are likely to be making extensive efforts to “look good” and appear compliant. They are also likely to remain in treatment solely under the expectation of receiving external rewards (i.e., restoration of driving privileges, avoiding further legal difficulties). Consequently, the outcome measures related to perceived and self-reported treatment participation may be just as likely to reflect the influence of this external motivation as to reveal the level of their intrinsic motivation.

Generally speaking, the characteristics of the participating DUI offenders in this study are worth noting. This cohort of offenders appears to be reporting for treatment with the intention of restoring driving privileges or improving interactions with the legal system. Although this underlying theme in their motivation for enrollment appears universal, the wide range of time lapse between offense and treatment intake tells us that other factors may be influencing this group’s treatment-seeking efforts. Many may be avoiding treatment if at all possible while others appear to be seeking immediate help to mitigate their mistakes in the eyes of the legal system. Either way, by the time they present for enrollment in the treatment program, they are anxious to convey a desire to comply with and complete treatment. They were overwhelmingly willing, or at least wanted to appear willing, to participate in treatment and this study. In this sense, they truly appear to be the “best of the worst”.

This group of offenders is slightly older, male, and predominantly White. Less than half are repeat offenders and many, although enrolled in the 26-week treatment program do not appear to have significant drinking problems. These offenders had options of enrolling in more intensive treatment programs (i.e., intensive outpatient or inpatient) but chose to attend their local, community treatment clinic instead. Only a

small number of them appear to have issues with other-drug abuse. Their most significant life stressors are their legal or employment difficulties. The impact of their restricted driving privileges, especially for those who have been reticent to seek treatment for significant period of time, is apparent in their ability to maintain satisfactory employment. Consequently, this group boasts below-average incomes. Many have found ways to circumvent their driving restrictions to employment, but some have not. Ultimately, however, it is difficult to confidently (and accurately) generalize about this sample because of concurrent diversity on many characteristics. Further discussion of the issues of heterogeneity follows.

Subsets of the DUI offender population. Many of the results of this study tell us that DUI offenders are probably not as a homogenous population as they are assumed to be in much of the literature. Recidivism and time lapse between offense and intake are distinguishing characteristics of the subsets of DUI offenders that need to be a focus on ongoing research and an essential part of the assessment process with this population. Additional differences on ASI scores (i.e., medical, psychiatric) between “recent” and “non-recent” offenders further supports this notion. Although the sample appears largely homogenous on the remaining descriptive variables, based on an examination of the other baseline measures collected as part of this study, the significant differences and trends indicate that further emphasis and discussion on the diversity of this population is needed.

As outcome results related to recidivists were not wholly unexpected, they do confirm that recidivists are more at risk for non-compliance with treatment standards (i.e., higher number of positive UAs, continued drinking during treatment) that might undermine treatment progress and negatively impact other treatment outcome measures.

When compared to first-time offenders, recidivists were generally perceived to be higher in self-confidence during treatment. However, the subset of “recent” offenders in this group was actually viewed as having lower self-confidence.

All these findings appear to provide preliminary evidence that recidivists and first-time offenders differ significantly in behavior, presentation and reaction to treatment interventions. Assessment of offenders entering treatment should take into consideration recidivist status and evaluation should focus on comparing the offender to his respective subgroup of the population. Treatment efforts should take into consideration the risk for treatment-undermining behaviors that may be present for either recidivists or first-time offenders. Treatment planning should include consideration of the differing treatment needs of recidivists and first-time offenders. Expectations regarding treatment outcome should be based on an understanding of the treatment progress difference between these subgroups.

As discussed above, the interaction between recidivist status and the MI intervention suggests that recidivists may selectively benefit from motivational enhancement strategies. In particular, MI appears to offer these recidivists help in improving treatment participation (i.e., self-confidence). Repeat offenders may be dealing with issues of facing legal stressors and treatment interventions that they have faced before, which may, in turn, undermine their motivation and confidence when re-entering treatment.

However, some recidivists may be seeking treatment for the first time even though they have multiple offenses. Data related to this occurrence was not collected during this study. Obviously, these recidivists would be facing difference issues and

stressors entering treatment, which may be indicative for their pattern for not having sought treatment sooner (i.e., after previous DUI offenses). Therefore, prior treatment history may be a critical variable to consider, both for research and clinical purposes.

In relation to previous research examining the relationship between treatment and recidivism, the implications of this study are not clear. Recidivists typically do not respond well to treatment interventions and are particularly at-risk for repeat offenses. Dealing with impact of these offenses has been both problematic and troublesome from both a legal and a clinical perspective. It appears that MI might at least offer some hope for improving treatment outcomes with a population that is struggling at best.

Based on the extensive secondary analyses that were conducted with the “recent” offenders’ subgroup, findings from this research offer us some significant insight regarding this subset of the population. “Recent” offenders were found to differ significantly from “non-recent” offenders on several important variables, suggesting that distinguishing between and treating these subsets deserve further attention in the clinic and in research efforts. Compared to “non-recent” offenders, “recent” offenders face dissimilar stressors and issues (e.g., recent interaction with legal system, impact of legal punishments on family and work functioning) when entering treatment. Moreover, “recent” offenders exhibit markedly different drinking patterns prior and during treatment.

It appears that MI may be a particularly effective supplement to treatment for “recent” offenders based on the significant impact it had on treatment participation (i.e., rapport), as well as the trend of consistently beneficial changes in mean on the outcome measures for the second model. It appears that two sessions of MI intervention

effectively moves “recent” offender along through the stages of change process in a manner that suggests positive treatment outcomes.

MI may be effective with this subset of the population because “recent” offenders respond more quickly to the motivational enhancement efforts. Consequently, it may be that those offenders who have been reticent to pursue treatment represent the part of the population that will require extended or more intensive motivational enhancement strategies before they benefit from treatment.

As one final implication of these findings, results suggest that an offender’s baseline levels of motivation for treatment or change (i.e., *desire for help* and *problem recognition*) are important constructs to consider during the assessment and treatment planning aspects of the program. For example, continuing to assess baseline levels of motivation for treatment or change could inform clinicians about appropriate treatment planning and interventions. Pre-treatment motivation appears to be directly related to aspects of treatment participation. Determining the level of a client’s problem recognition or desire for help may help clinicians target motivational enhancement strategies and further improve participation and, potential, other treatment outcomes.

Limitation of the Study

There are several limitations to this study that warrant brief discussion and, more specifically, should be considered as potential factors for the lack of findings in this study.

Follow-up period. One issue is the decision to conduct follow-up data collection at approximately the three-month mark in treatment versus waiting to collect follow-up data a later date. Although this undoubtedly increased the likelihood of making follow-

up contact with all recruited offenders in this study (which proved to be the case), it may be that this was not a sufficient enough period of time to wait for assessment some of the outcome variables.

For example, treatment retention was measured by whether or not clients were still attending sessions at follow-up or appeared to be dropped out of treatment. However, it is likely that a three-month assessment might not accurately reflect successful treatment completion.

Another reason why the three-month follow-up may have impacted measures of outcome is that many of the clients may not have had enough time in treatment in order to experience the positive effects of the interventions. Research supports that idea that time in treatment is positively correlated with treatment outcomes (Gossop, Marsden, Stewart, & Kidd, 2003). This may have simply been too soon adequately assess the full benefit that client might have had from enrollment in the program. In this vein, it may be reasonable to assume that treatment outcomes might significantly differ at 6 months or 12 months for many clients. Given that the average length of time to recidivate is approximately one year (NHTSA & NIAAA, 1997), extended follow-up should be an important consideration for future research (see below).

Over-representation of males. The issue of possible over-representation of males in this sample should also be considered. As discussed previously, the ability to generalize results might be compromised by such findings.

Time lapse between offense and intake. Another issue that became apparent during the course of this study was the generally unexpected amount of time that had lapsed between offense and enrollment in treatment for a large number of the recruited

offenders. The wide range included a large number of individuals who had not sought treatment for up to several years before enrolling at the time of the study. Consequently, it is likely that sample characteristic may have contributed to this sample being homogenous than anticipated. In fact, this issue may also reflect on problems in the DUI literature in general.

Relate to this issue, it should also be noted that data about the subjects at the time of the treatment intake was collected under the assumption that this was each subject's initial attempt to seek treatment since their most recent DUI offense. Data regarding previous treatment "attempts" was not recorded and such data would have likely shed more light on the specific help-seeking behaviors of this sample.

Response bias. The issue of response bias needs to be considered on several levels. One level is the general expectation that clients enrolling in treatment should present as cooperative as possible despite an underlying low motivation for treatment or change. This bias may have influenced the response of this study's offenders at both baseline and follow-up. It is likely that these offenders were especially prone to misreport behaviors and attitudes in order to appear compliant with treatment as a by-product of motivation being more externally oriented.

Another level of response bias deals with the fact that the MI intervention and the data collection were administered by the same individual. Participants may have been influenced by this dual relationship to over-report motivation or participation and under-report negative behaviors, both at baseline and at follow-up.

Treatment fidelity. The issue of treatment fidelity should be touched on briefly. Although it was clearly established that the MI intervention in the present study,

as rated by trained raters, met beginning proficiency levels according to established standards, the minimal level of proficiency may not have been adequate for some clients who might have benefited from a higher level of proficiency delivering this intervention. Ratings of the therapist in this study met only a couple of higher standard benchmarks that have been set for professional proficiency by the same researchers (Moyers et al., 2003). Although the MI intervention was rated as sufficient in the standards for this study, it maybe that a higher proficiency would have selectively improved outcomes for some types offenders enrolled in treatment.

It may also be that DUI offenders need more than two MI sessions in order to fully benefit from such a motivational enhancement intervention. Although research has established the efficacy of the two-session model (citations) with several populations, it may be that the unique characteristics of the DUI offender population require increased quantities of the intervention, in addition to improved quality.

Measurement. Another possible limitation of this study involves the measure utilized to assessment variables of interest. Although adequate reasoning, supported by established reliability and validity, was employed in the selection of the measures for this study, alternative methods and measures exist and might be considered in future research (see below). For example, measures of self-report are fallible for a variety of reasons (Schacter, 1999) and some constructs may be better evaluated by direct assessment of behavior.

As an example, the TLFB method is not the only method for obtaining data about drinking behavior. Although reasonable reliability and accuracy data has been established for the procedure, it may still be influenced by self-report biases, the

fallibility of human memory, and the limitations of logistics can undermine such a method. Additional concerns could be raised regarding the self-report measures of motivation and treatment participation, as well as the counselor-report measure of treatment motivation.

Sample size. An inherent limitation of most clinical research, the examination of these variables with a relatively larger sample size would: 1) improve the likelihood of finding significant results, 2) increase ability to generalize results to the population from which the sample was recruited, 3) compensate for some weaknesses in the research design, and 4) establish “stronger” (i.e., non-biased) evidence related to the findings of this study.

Direction for Future Research

Based on all the aspects of this discussion, the findings in and limitations of this study suggest several interesting directions for future research.

Some methodological considerations include the following:

- Specifically defining the population of interest (i.e., types of DUI offenders or subsets of the DUI offender population).
- Assessing for co-morbid psychopathology among the sample and evaluating impact of such conditions on treatment process or outcome.
- Collecting immediate treatment outcome data and then extending the follow-up data collection to 6 months or possibly 12 months. Long-term follow-up may be essential in this type of study.
- Focusing research on “recent” offenders. Further research may better establish what the crucial threshold might be in terms of time lapsed before

seeking treatment, further clarifying which clients may truly be considered “recent” offenders.

- Considering the larger environment that is associated with these offenders or the broader context of their drinking, such as their social or familial relationships. Research has demonstrated that the social relationships of those in alcohol abuse treatment can have a major role in helping clients maintain treatment progress or leading them to relapse (Ohannessian & Hesselbrock, 1993; Litman, 1986; Beattie et al., 1993). An instrument such as the Important People and Activities Instrument (IPA; Clifford & Longabough, 1991) may be an appropriate measure of this factor to consider for future research because it has been shown to be useful to both clinicians and researchers, and predicts a variety of treatment outcomes related to treatment of alcohol abuse (Clifford et al., 1992; Beattie et al., 1993; Longabough et al., 1995).
- Involving multiple research assistants in order to avoid dual relationships of therapy and data collection
- Increasing MI treatment proficiency or quantity of sessions. Impact of changes made in either of these areas probably warrant consideration. MI may also need to be further “tailored” to the treatment needs of DUI offenders, including the possibility of increasing the “dosage” of the intervention.

- Employing treatment process variables to predict treatment outcome variables. For example, using data-related treatment compliance (i.e., positive UAs) to predict recidivism.
- Collecting other specific information regarding drinking behaviors and drinking and driving behaviors (especially with this population). For example, the TLFB methods may be employed to find out where offenders are consuming alcohol (i.e., home alone versus social situations) and which settings have traditionally put them more at risk for drunk driving or other problematic drinking behaviors. This method could also be used to find out how often and when offenders are driving, as well as how often and when they are drinking and driving. These data would make this type of measure of increased value to researchers.
- Employing alternative measurement techniques and data collection methods. Several alternatives appear worthy of consideration:
 - In terms of measurement of alcohol consumption, there are a couple of more traditional ways of measuring drinking patterns besides employing the Timeline Follow-back (TLFB) method. The quantity/frequency index, which determines the average quantity a person drinks per occasion and how often they drink, or the more complicated graduated frequency measure, a series of questions about the greatest number of drinks consumed on any one occasion, are two recall, self-report alternatives to the TLFB. Or the client can be asked to complete a self-monitoring

procedure where accurate records of drinking practices are recorded over a specific period of time.

- Measurement of alcohol problems can be done by surveying different types of negative consequences that a person has as a result of drinking. Two possible measures include Cahalan's problem drinking scale (1970) or the alcohol symptoms list from the Diagnostic Interview Schedule (Robbins et al., 1981).
- Established alternative measures of treatment motivation or readiness for change include: 1) the URICA (University of Rhode Island Change Assessment Scale; McConaughy, Prochaska & Velicer, 1983; McConaughy, DiClemente, Prochaska & Velicer, 1989), a method of classifying clients in the four stages of change (see Connors, Donovan & DiClemente, 2001), 2) the SOCRATES (Stages of Change Readiness and Treatment Eagerness Scale; Miller & Tonigan, 1996), a measure analogous to the URICA, and 3) the RCQ (Readiness to Change Questionnaire; Rollnick, Heather, Gold & Hall, 1992), a brief measure focused on the initial three stages of change.

Besides methodological improvements, several interesting studies could follow from this research. One obvious avenue would be to continue to monitor the treatment progress of this sample recruited in this study or collect data from a similar sample.

More focused research on assessing the difference between recidivists and first-time offenders, and the impact of interventions such as MI, appears to warrant some attention. A clinical trial looking at more specific effects of recidivist status on MI

intervention process and outcome variables would further clarify some of the findings from this research.

In the same vein, research focusing on “recent” offenders versus “non-recent” offenders appears to warrant some more attention. Clinical trials examining the difference between these populations and focusing on “recent” offender, in particular, appear to be the most defensible.

APPENDICES

Appendix A: Informed Consent to Participate

CONSENT TO PARTICIPATE IN RESEARCH

DWI-DUI: Treatment Compliance, Retention, and Motivation for Treatment

You are being asked to take part in a pilot research study that will be conducted at the Epoch Counseling Centers by Kevin O'Grady, Ph.D., a research investigator at Friends Research Institute, and Aaron Harris, M.A., a researcher from the University of Maryland, College Park. You are being asked to take part in this research study because you have recently been arrested for or convicted of a Driving While Intoxicated (DWI) or Driving Under the Influence (DUI) offense, and are now seeking substance-abuse treatment at one of the Epoch Counseling Centers.

There will be approximately 120 participants in this research study. Your consent to participate is voluntary. You should read the information below, and ask questions about anything that you do not understand, before deciding whether or not to take part.

PURPOSE OF THE RESEARCH STUDY

The purpose of this research study is to measure treatment compliance (efforts to complete the requirements of the program), retention (continued enrollment in the program), and motivation (commitment to change substance abuse behaviors) of DWI/DUI offenders who are seeking treatment for substance abuse or dependence.

By studying these factors with DWI/DUI offenders, we hope to better understand how to improve treatment results for this group of people.

PROCEDURES

If you volunteer to take part in this research study, we will ask you to do the following:

- Participate in a 20-30 minute *pre-counseling session*, where you will:
 1. Create a calendar, which shows your substance abuse behaviors for the past 30 days
 2. Fill out a short questionnaire about your views of treatment
 3. Be randomly assigned (meaning that you have the same chance to be assigned to either group) to one of two groups.
- If you are randomly assigned to Group 1, you will attend two *motivational sessions* in place of Epoch Counseling Center's two initial group-counseling sessions. These two 1-hour sessions will focus on your motivation to change your substance abuse behaviors and desire to achieve a successful outcome. These two sessions will take place at the same time and location of the group treatment sessions to which the Epoch Counseling Centers have assigned you, and they will be counted as 2 of the 26 sessions required by the Epoch Counseling Center for successful discharge from treatment. After these two sessions you will attend the regular Epoch group counseling sessions.
- If you are randomly assigned to Group 2, you will attend Epoch Counseling Center's standard group counseling sessions. This involves weekly group sessions to talk about problems that substance abusers face. These sessions focus on problematic behaviors, health, family, and work-related issues, social and coping skills, confidence building, and promoting positive changes.
- If you continue to take part in this research study, in 6 months you will meet with a researcher for a similar, brief *follow-up session*. At the 15-20 minute follow-up session, you will:
 1. Create a calendar, which shows your substance abuse behaviors for the past 30 days.
 2. Fill out a short questionnaire about your views of treatment

- Allow the researchers to have *access to information* contained in your patient file at the Epoch Counseling Centers. This information will be kept confidential and secure from anyone not involved in this research study. The researchers will maintain the security and confidentiality of these files, and will only look at the following:
 1. Demographic information (such as your age, gender, race/ethnicity)
 2. History of DUI/DWI offenses
 3. Information that you filled out in questionnaires for the Epoch Center counselors, about your substance abuse behavior, thoughts, and feelings
 4. Your progress in the Epoch counseling program (including: your attendance, the length of treatment, and if you completed all of the requirements)
- In addition to the above information, your Epoch counselor will be asked to complete a brief questionnaire about his/her views on your treatment attitudes and progress.

POTENTIAL RISKS AND DISCOMFORTS

The primary risk of this research study is the potential release of personal information to other people. If this sensitive information were to be revealed to law enforcement or other authorities, you could face prosecution, loss of employment, or poor relations with your family, but we will be doing many things to protect your privacy (described in the next section below).

Since you will be discussing sensitive information, you could become upset in reaction to some of the questions that we will ask you. Pre-counseling and follow-up sessions will be held in Epoch Counseling Centers, where counselors will be available if you need to speak with someone.

If you are assigned to Group 1 with the *motivational sessions*, and if for some reason you feel uncomfortable in these sessions, another type of counseling will be available to you.

PRIVACY AND CONFIDENTIALITY

The only people who will know that you are a research participant are the research investigators, motivational counselors, and the counselors and staff of the Epoch Counseling Centers. No information about you, or provided by you during the research, will be disclosed to others without your written permission, except:

- if necessary to protect your rights or welfare (for example, if you are injured and need emergency care);
- any threats that you make to harm yourself or others;
- information that a child has been subjected to abuse or neglect; or
- evidence of an infectious or contagious disease that endangers the public health.

We will make use of number codes (such as 101, 102, 103) to identify participants in this research study. This unique code will be the only link for all of the information collected from you for this research study. Your identifying information (such as your name and address) will be kept separate from all other personal and sensitive information, and only the principal investigator and co-investigator in this research study will have access to it.

All information will be kept secure in locked cabinets and password-protected files. After data analyses are complete, your individual responses to the questionnaires will be destroyed.

ANTICIPATED BENEFITS TO SUBJECTS

If you are not assigned to take part in the *motivational sessions* you should not expect your condition to improve, beyond the typical gains made in group counseling, as a result of taking part in this research.

If you are assigned to and take part in the *motivational sessions*, you may receive additional benefits. Of course, no one can know in advance if it will be helpful to you because people respond differently to different types of counseling. However, the potential benefits may include greater motivation to change your substance abuse behaviors and greater chance that you will stay in treatment services.

ANTICIPATED BENEFITS TO SOCIETY

The information you provide may help us to gain a better understanding of the effectiveness of motivational sessions and the factors that affect treatment motivation, compliance, and retention.

ALTERNATIVES TO PARTICIPATION

If you choose not to participate in this pilot research study, *it will in no way affect* your participation in the standard group counseling program offered by Epoch Counseling Centers.

PARTICIPATION AND WITHDRAWAL

Taking part in this research is VOLUNTARY. If you choose not to take part, your decision will not affect your relationship with the Epoch Counseling Centers. Even if you decide to take part in this research study now, you are free to withdraw your consent and discontinue at any time without affecting your care at the Epoch Counseling Centers.

WITHDRAWAL OF PARTICIPATION BY THE INVESTIGATOR

The investigators in this research study reserve the right to withdraw you from participating in this research if it is in your best interest, or the interest of the research study. It is unlikely that this will occur. Examples of this include: decisions made by the Epoch Counseling Centers to change your treatment status; and developments that suggest motivational treatments are not appropriate (for example, more severe issues need to be addressed first) at this stage in your treatment.

NEW FINDINGS

During the course of the research study, you will be informed of any significant new findings (either good or bad) that might cause you to change your mind about continuing in the research study. If new information is provided to you, your consent to continue taking part in this research study will be re-obtained.

IDENTIFICATION OF INVESTIGATORS

In the event of a research related concern or if you experience an adverse reaction, please immediately contact one of the investigators listed below. If you have any questions about the research, please contact the investigators or the Epoch Counseling Centers listed below:

- Epoch Counseling Centers: Essex Center: (410) 574-2500
North Point Center: (410) 284-3070
Southeast Center: (410) 887-7344

Appendix B: CESI (Client Evaluation of Self at Intake)

Client Evaluation of Self at Intake

Please read each of the following statements about how you see yourself or your treatment in this agency. Indicate how strongly you AGREE or DISAGREE with the statement by filling in the appropriate circle. If you strongly disagree with the statement, fill in the circle under the "Disagree Strongly" column. If you disagree with the statement, but don't feel strongly about it, fill in the circle under the "Disagree" column. If you don't know whether you agree or disagree with the statement, fill in the circle below the "Undecided" column. If you agree with the statement, but don't feel very strongly about it, fill in the circle below the "Agree" column. If you agree with the statement and feel strongly about it, fill in the circle under the "Agree Strongly" column. Please mark only one circle for each statement. When you are finished, return this survey to your counselor.

	Disagree Strongly	Disagree	Undecided	Agree	Agree Strongly
Your drug use is a problem for you.	<input type="radio"/>				
You need help in dealing with your drug use.	<input type="radio"/>				
You plan to stay in this treatment program for awhile.	<input type="radio"/>				
Your drug use is more trouble than it's worth.	<input type="radio"/>				
This treatment may be your last chance to solve your drug problems.	<input type="radio"/>				
It is urgent that you find help immediately for your drug use.	<input type="radio"/>				
This kind of treatment program will not be very helpful to you.	<input type="radio"/>				
Your drug use is causing problem with the law.	<input type="radio"/>				
Your drug use is causing problems in thinking or doing your work.	<input type="radio"/>				
This treatment program can really help you.	<input type="radio"/>				
You will give up your friends and hangouts to solve your drug problems.	<input type="radio"/>				
Your drug use is causing problems with your family or friends.	<input type="radio"/>				
You want to be in a drug treatment program now.	<input type="radio"/>				
Your life has gone out of control.	<input type="radio"/>				
Your drug use is causing problems in finding or keeping a job.	<input type="radio"/>				

You have too many outside responsibilities now to be in this treatment program.	<input type="radio"/>				
You are tired of the problems caused by drugs.	<input type="radio"/>				
You are in this treatment program because someone else made you come.	<input type="radio"/>				
Your drug use is causing problems with your health.	<input type="radio"/>				
You want to get your life straightened out.	<input type="radio"/>				
This treatment program seems too demanding for you now.	<input type="radio"/>				
Your drug use is making your life become worse and worse.	<input type="radio"/>				
Your drug use is going to cause your death if you do not quit soon.	<input type="radio"/>				

Appendix C: TLFB (Timeline Follow-back) Interviewer Instructions

Instructions for Interviewers Administering the Timeline Follow-back Calendar to Drinkers

Paper-and-Pencil Version

- What I would like you to do is recall your drinking for the past 30 days.
- We want to get an idea of how much alcohol you consumed on each day during this time.
- This is not a difficult task, especially when you use a calendar like this one. (show sample calendar)
- What the calendar does is give you a PICTURE of the dates and patterns of your drinking.
- What we have found is that calendars are very useful in helping people recall their drinking.
- On this sample calendar (show person sample calendar), as you can see, a number has been filled in for each day.
- The idea is to record the number of drinks you consumed each day.
- On days when you did not drink any alcohol, not even a sip of a drink, you would write "O."
- For days when you had something to drink, you would write in the number of drinks YOU consumed.
- The important thing is to make sure something is written in for each day on the calendar.
- It is important that you record your drinking on the calendar in terms of Standard Drinks. This is because different types of beverages contain different concentrations of alcohol.
- This card shows what a Standard Drink is: (standard drink card is shown to the person)
- What type of alcoholic beverage do you typically drink? (Respondent replies)
- So if you had 6 beers on a given day, what would you write down? (Drinker replies)
- Now if you mix your types of drinks, using Standard Drinks is also easy. For example, if you had two regular beers and three 5-oz. glasses of wine, how many Standard Drinks would you write down? (Drinker replies)
- Do you think you understand how to report your drinking using Standard Drinks? (Drinker replies)

Helpful Hints - There are a few other helpful tips that can aid you in reporting your drinking on the calendar.

- If you have an appointment book or a daily diary, you can use it to help you recall your drinking.
- Standard holidays such as Halloween and Christmas are marked on the calendar to help you recall your drinking around these times. You can also write in personal holidays and events such as birthdays, vacations, celebrations, major sporting events, and so on.
- People who have fairly regular drinking patterns can use such patterns to help them fill out the calendar. For example, you may have a weekend/weekday change in your drinking or your

drinking may be different depending on the season, or whether you are on holidays/business trips, or you may drink every Thursday when playing cards.

Your Best Estimate - In filling out the calendar, we want you to be as accurate as possible.

- I realize that it is hard for anyone to recall things with 100% accuracy, whether it is drinking or anything else.
- If you can't recall whether you drank on a Monday or a Thursday of a certain week, or whether it was the week of November 9th or November 16th, GIVE IT YOUR BEST GUESS.
- If you are not sure whether you drank 15, 16, or 17 drinks, choose the midpoint of the range, so for 15 to 17 drinks, you would write "16" drinks. The important point here is that 15 to 17 drinks is very different than if you said you drank only 1 or 2 drinks or 30 to 35 drinks. Does that make sense? (Drinker replies)
- Remember: Your job is to provide your best daily estimate using the calendar.

Start Calendar With Drinker

- Let's begin! As I said before, what I want you to do is use the calendar to record your drinking over the past 30 days.
- Let's start with yesterday (date) and go back 30 days—those dates are (date) through (date). (Interviewer marks these dates on the calendar and shows the Drinker)
- Do you have any special holidays or dates you want to mark on the calendar to help you better recall your drinking during the past 30 days? (Drinker replies and fills in calendar if appropriate)
- When did you last drink in this 30 day period? (Drinker replies with a date)
- How much did you drink on this day? (Drinker replies with an amount and interviewer enters that number on the calendar for the appropriate date)
- What was the greatest amount you consumed on any given day during this period? Do you recall when this occurred? (Drinker replies with an amount and a date)
- What was the least amount of drinking during this period and when did it occur? (Drinker replies with an amount and a date)
- As mentioned earlier, some people will have patterns to their drinking that can help them recall their use. Do you have any notable patterns to your drinking? (Drinker replies)

Probing Extended Abstinent or Drinking Periods

- During this period of time, did you have any extended periods of abstinence of 7 days or more when you did not drink any alcohol at all, not even a drop? (Drinker replies) What was the longest period of total abstinence during this time? What was the next longest period of total abstinence?
- During this period of time, did you have any extended periods of heavy drinking of 7 days or more? (Drinker replies) What was the longest number of continuous days in a row you were

drinking during this period? (determine dates and amounts of alcohol consumed on each day)

What was the next longest period of continuous drinking days?

- You appear ready to fill in the rest of the calendar. Do you have any questions?
- If not, let's begin. If you have any questions, I will be (wherever interviewer will be).

Note to Interviewers: Completing the Calendar in a Flexible Manner

- People can start from either end of the calendar and work forward or backward, or jump around from month to month.
- If someone has trouble recalling his/her drinking, try working back from the date of the interview. Say, "What about this past month; what was your drinking like then?" The most recent months are often most familiar, and the person might find it easier to reflect upon those periods first.

Appendix D: Motivational Interviewing 2-Session Overview

Session 1

- Present “readiness for change” ladder to client
- Ask the client where they feel that they fall on the ladder – (*indicate with a circle*)
- Brief description of structure of sessions:
 - Rationale for client-centered therapy
 - *“During the time we spend together we will be taking a close look at your situation and you should find these sessions interesting and helpful. I should explain right up front that I’m not going to be changing you. I hope that I can help you think about your present situation and consider what, if anything, you might want to do, but if there is any changing, you will be the one who does it. Nobody can tell you what to do; nobody can make you change. I’ll be giving you some information about yourself and maybe some advice, but what you do with all that after our sessions is completely up to you. I couldn’t change you if I wanted to. The only person who can decide whether and how you change is you. How does that sound to you?”*
- Proceed to employ various strategies for eliciting self-motivational statements.
 - “I want to better understand how you see your situation . . .”
 - Listen with empathy early in this session
 - Affirm client, handle resistance and reframe as appropriate
- Summarize the major themes and concerns of the client
- Begin working to consolidate a commitment to change
 - Elicit thoughts, ideas and plans for what might be done to address the problems
 - Elicit the perceived possible benefits of action and the likely negative consequences of inaction (note: can be written down on a **Balance Sheet**)
- Summarize again at the conclusion of the session
- Therapist assesses “readiness” using ladder rating – (*indicate with a box*)

Session 2

- Review the seven areas of the ASI with the client (feedback)
 - Emphasize their “self-rating” in each area
 - Emphasize the intake counselor’s rating in each area
- Ask for the client’s overall response
 - “We’ve reviewed quite a bit of information here, and at this point, I wonder what you make of all this and what you are thinking . . .”
- Summarize (again) the major themes and concerns of the client
- Continue working to consolidate a commitment to change
 - Elicit thoughts, ideas and plans for what might be done to address the problems
 - Elicit the perceived possible benefits of action and the likely negative consequences of inaction
- Work toward a confirmation of a plan for change and obtain any commitments in this regard (note: can be helpful to write down the clients goals and planned steps for change on a **Change Plan Worksheet**)
- Summarize again at the conclusion of the session

Appendix E: Recording Informed Consent

CONSENT TO PARTICIPATE IN RESEARCH
DWI-DUI: Treatment Compliance, Retention, and Motivation for Treatment

Consent to Audiotape: Motivational Interview Session Client

You are being asked to participate in a pilot research study at the Epoch Counseling Centers conducted by Kevin O'Grady, Ph.D., and Aaron Harris, M.A., from the University of Maryland, College Park. Your participation in this study is entirely voluntary. You should read the information below, and ask questions about anything that you do not understand, before deciding whether or not to participate.

What is this informed consent?

The purpose of this form is to tell you about the study being conducted and to request your consent to participate in this study.

What is the study being conducted?

The purpose of this study is to measure the treatment compliance, retention, and motivation for treatment of DWI/DUI offenders who are seeking treatment for substance abuse or dependence.

What does being in this study involve?

- If you volunteer to participate, you will be recorded (audio-taped) during one individual session in which you are a client for a motivational therapy at the Epoch Counseling Centers.
- The recording of the therapy session will then be reviewed by the researchers to evaluate the general nature of the therapy interaction.
- You will receive no compensation for your participation.

Confidentiality and privacy

- If you choose to take part in this study, all information received from you and recorded during the sessions is protected under both federal and state confidentiality laws and regulations.
- After recording, the study coordinators will review the audiotape and erase any possible identifying information about either the therapist or client. Consequently, the privacy and confidentiality of all individuals involved in the session will be maintained.
- The audiotape will be completely erased at the conclusion of the study.
- All reports of findings from this study will consist of information about groups rather than individuals.

What are the benefits you might receive from participating in this study?

- There are no direct benefits from participating in this study.
- You may contribute to advancing our knowledge about treatment motivation and treatment outcome in DWI/DUI offenders.

What are the risks that you might experience from this study?

- Although minimal, there is the risk of release of confidential information. Study procedures and staff training are in place to protect you from such a risk.
- You might experience some emotional discomfort as a result of being recorded while conducting a therapy session.

Your rights

- Your participation in this study is entirely voluntary and you may terminate your participation at any time. Your decision about whether or not to participate in this study will in no way affect your standing with the Epoch Counseling Centers.
- At any time during your participation in this study, you may choose to discontinue recording of the therapy session or choose to have the recording and data erased immediately and withdrawn from the study.

Your consent

- Any questions you have about the research must be answered to your satisfaction. If you have any questions, or in the event of a research related adverse reaction or injury, you may contact Kevin E. O'Grady or Aaron A. Harris at 301-405-5902, or 410-837-3977 ext. 243.
- If you have any questions about your rights as a research participant, you may contact Janet Klein Brown, Ph.D., MSW, Chairperson of the Friends Research Institute, Inc., Institutional Review Board, at 410-823-5116.
- You will be given a copy of this consent form to keep. A copy will also be placed in the coordinators' research records.
- Your signature means that you have read this form, understand all statements relating to your participation in the study and that you agree to take part in the study.

SIGNATURE OF RESEARCH SUBJECT

I am at least 18 years of age and have read and understand the information provided above. I have been given an opportunity to ask questions and all of my questions have been answered to my satisfaction. I have been given a copy of this form.

Name of Participant

Signature of Participant

Date

SIGNATURE OF RESEARCH INVESTIGATOR

I have explained the research to the subject, and answered all of his/her questions.

Name of Person Obtaining Consent

Signature of Person Obtaining Consent

Date (must be the same as subject's)

Appendix F: Motivational Interviewing Treatment Integrity (MITI) Coding Sheet

Coding Sheet rev 10/03

Tape # _____ Coder: _____ Time: _____

Global Ratings

Empathy/ Understanding		1 2 3 4 5 6 7 Low High
Spirit		1 2 3 4 5 6 7 Low High

Behavior Counts

Giving Information			
MI Adherent	Asking permission, affirm, emphasize control, support.		
MI Non-adherent	Advise, confront, direct.		
Question (subclassify)	Open Question		
	Closed Question		
Reflect (subclassify)	Simple		
	Complex		
	TOTAL REFLECTIONS:		

First sentence: _____

Last sentence: _____

Appendix G: Client Evaluation of Treatment

Please read each of the following statements about how you see yourself or your treatment in this agency. Indicate how strongly you AGREE or DISAGREE with the statement by filling in the appropriate circle. If you strongly disagree with the statement, fill in the circle under the "Disagree Strongly" column. If you disagree with the statement, but don't feel strongly about it, fill in the circle under the "Disagree" column. If you don't know whether you agree or disagree with the statement, fill in the circle below the "Undecided" column. If you agree with the statement, but don't feel very strongly about it, fill in the circle below the "Agree" column. If you agree with the statement and feel strongly about it, fill in the circle under the "Agree Strongly" column. Please mark only one circle for each statement. When you are finished, return this survey to your counselor.

	Disagree Strongly	Disagree	Undecided	Agree	Agree Strongly
You are willing to talk about your feelings during counseling.	<input type="radio"/>				
You have made progress with your drug/alcohol problems.	<input type="radio"/>				
You have learned to analyze and plan ways to solve your problems.	<input type="radio"/>				
You have made progress toward your treatment program goals.	<input type="radio"/>				
You always attend the counseling sessions scheduled for you.	<input type="radio"/>				
You have stopped or greatly reduced your drug use while in this program.	<input type="radio"/>				
You always participate actively in your counseling sessions.	<input type="radio"/>				
You have made progress in understanding your feelings and behavior.	<input type="radio"/>				
You have improved your relationships with other people because of this treatment.	<input type="radio"/>				
You have made progress with your emotional and psychological issues.	<input type="radio"/>				
You give honest feedback during counseling.	<input type="radio"/>				
You are following your counselor's guidance.	<input type="radio"/>				

Appendix H: Counselor Rating of Client

Counselor Rating of Client

Please read each of the following statements and fill in the appropriate circle to show how much you AGREE or DISAGREE with each item based on your interactions and counseling activities with your client during the last 3 months. Respond to the first set of items with regard to the client himself/herself and the second set of items with regard to a description of the counseling activities with that client.

CLIENT ATTRIBUTES:	Disagree Strongly	Disagree	Undecided	Agree	Agree Strongly
Easy to talk to	<input type="radio"/>				
Warm & caring	<input type="radio"/>				
Honest & sincere	<input type="radio"/>				
Cooperative	<input type="radio"/>				
Responsible	<input type="radio"/>				
Hostile or aggressive	<input type="radio"/>				
Depressed	<input type="radio"/>				
Impulsive	<input type="radio"/>				
Nervous or anxious	<input type="radio"/>				
Self-confident	<input type="radio"/>				
Manipulative	<input type="radio"/>				
Freely expresses wishes	<input type="radio"/>				
Motivated to recover	<input type="radio"/>				
Consistently keeps session appointments	<input type="radio"/>				
Is liked by other clients	<input type="radio"/>				
Participate in groups discussions	<input type="radio"/>				
Thinks clearly	<input type="radio"/>				
Pays attention	<input type="radio"/>				
Clearly expresses thoughts and feelings	<input type="radio"/>				
Review problems logically	<input type="radio"/>				
Has good memory or recall	<input type="radio"/>				
In denial about problems	<input type="radio"/>				
Easily distracted	<input type="radio"/>				

Follows through on commitments	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Is liked by staff	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
COUNSELING FOCUS:	Disagree Strongly	Disagree	Undecided	Agree	Agree Strongly
Responding to crises	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Discussing occupational issues	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Establishing trust & rapport	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Discussing family issues	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Exploring feelings	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Making new friends	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Improving communication skills	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Negotiating and resolving conflicts	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Improving family relations	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Reducing denial	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Confronting	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Improving objectivity	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Assuming appropriate responsibility	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Defining long-range goals	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Specifying short-term objectives	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Developing coping plan and strategies	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Defining personal boundaries	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Improving self-esteem	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Building confidence	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Praising and encouraging	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Developing problem-solving skills	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Managing finances	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Discussing relapse situations and “triggers”	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

Appendix I: Correlation Tables

Table 16, Parts 1-5

Table 16 (Part 1)

Simple Pearson Product-Moment Correlations Among All Study Variables

	Total number of DUI arrests	Time lapse from offense	Primary abuse problem	Group assignment	Tx center	Tx group	Gender	Age	Race
Timelapse from offense	.212								
Primary abuse problem	-.078	.094							
Group assignment	-.036	-.015	.032						
Treatment center	.021	-.045	.277	.000					
Treatment group	.018	-.073	.242	-.013	.983				
Gender	-.111	-.094	.059	.042	.023	.069			
Age	.157	.188	-.068	-.018	.135	.105	-.081		
Race	.257	.093	-.143	.044	.000	.011	-.078	.023	
Recidivist status	.763	.272	-.117	-.059	.085	.085	-.116	.171	.260
MAST score	.422	.061	-.035	.122	.023	.047	.015	.075	.105
MAST category	.331	.176	-.076	.110	.079	.075	-.056	.070	.047
Motivation: Problem recognition	-.047	-.130	.106	-.129	.111	.136	-.054	-.025	.013
Motivation: Desire for help	-.029	-.062	.068	-.059	.077	.090	-.066	.008	.034
Motivation: Treatment readiness	.066	.007	-.021	.018	.015	.026	.013	.009	.027
Client rating of readiness	-.052	-.133	.108	-.187	.072	.080	-.033	-.053	.048
Counselor rating of readiness	.061	-.133	.003	-.161	.090	.101	-.061	.035	.041
Pre-TLFB #1	.205	.650	.029	.035	-.077	-.106	-.078	-.028	-.016
Pre-TLFB #2	.319	.148	-.225	.014	-.147	-.167	-.125	-.016	.033
Pre-TLFB #3	-.247	-.132	.091	.122	.115	.129	-.022	.114	-.079
Pre-TLFB #4	-.232	-.141	.112	.055	.185	.201	-.015	.116	-.018
Pre-TLFB #5	-.252	-.198	.171	.054	.104	.110	-.027	.044	.002
Pre-TLFB #6	-.316	-.219	.181	.085	.057	.065	.019	.000	.025
ASI #1	.060	.258	.125	.016	.048	.044	.115	.183	-.103
ASI #2	.325	.267	.244	.086	.099	.048	-.018	.182	.006

ASI #3	-.055	-.082	-.010	-.079	.023	.061	.114	.011	.084
ASI #4	.040	-.010	.366	-.094	.292	.319	.253	-.107	-.073
ASI #5	-.093	-.317	.051	-.033	.144	.177	.272	-.070	.114
ASI #6	.036	-.057	.008	.033	.019	.045	.183	.053	.154
ASI #7	-.073	-.184	-.034	.176	.020	.025	.287	-.068	-.092
Enrollment status at 3-months	.047	.030	-.086	.038	-.019	.011	.091	.095	.005
Total number of missed sessions	.076	.042	-.070	.210*	.024	.013	-.008	-.036	.116
Total possible sessions to attend	.012	.101	.009	-.041	-.006	.016	-.171	.149	.035
Total number of sessions attended	-.043	.042	.053	-.169	-.020	.003	-.113	.127	-.054
Total number of positive UAs	.062	.184	.126	-.073	.138	.113	.053	.004	-.099
Positive UA status	.062	.033	.167	-.062	.186	.154	.010	-.075	-.123
TLFB #1	.205	.598	.028	.055	-.100	-.125	-.082	-.027	-.005
TLFB #2	.174	.061	-.097	-.088	-.002	-.019	-.076	.057	-.030
TLFB #3	-.141	-.014	.162	.087	.089	.090	.046	-.026	.083
TLFB #4	-.136	-.037	.173	-.59	.075	.091	.022	-.002	.079
TLFB #5	-.118	-.035	.216*	.111	.110	.117	-.035	-.024	.117
TLFB #6	-.137	-.039	.166	.145	.107	.113	-.005	-.009	.144
Client evaluation of tx participation	-.009	-.117	-.100	-.148	.022	.042	.087	.040	-.031
Participation: Self-confidence	.183	.013	-.038	-.182	.001	-.012	-.084	-.036	.266
Participation: Motivation	-.110	-.159	.010	-.136	.021	.036	-.025	.020	.113
Participation: Rapport	-.028	-.033	.034	-.133	.044	.063	.031	-.033	.121

Notes:

Primary abuse problem: 1 = primarily alcohol-related, 2 = co-morbid with drug

Group assignment : 1 = MI group, 2 = C group

Gender: 1 = male, 2 = female

Recidivist status: 0 = first-time offender, 1 = recidivist

MAST category: 0 = social drinker, 1 = problem drinker

Enrollment status at 3-months: 0 = no longer attending, 1 = still attending

Positive UA status: 0 = all negative UAs, 1 = at least one positive UA

Table 16 (Part 2)

Simple Pearson Product-Moment Correlations Among All Study Variables

	Recidivist status	MAST score	MAST group	Motivation: Problem recognition	Motivation: Desire for help	Motivation: Treatment readiness	Client rating of readiness	Counselor rating of readiness
MAST score	.371							
MAST category	.354	.65						
Motivation: Problem recognition	.005	.130	.068					
Motivation: Desire for help	.025	.145	.077	.825				
Motivation: Treatment readiness	.066	.142	.155	.529	.633			
Client rating of readiness	.036	.084	.008	.799	.795	.476		
Counselor rating of readiness	.106	.197	.139	.788	.786	.523	.894	
Pre-TLFB #1	.202	.034	.139	-.083	-.150	-.047	-.174	-.198
Pre-TLFB #2	.288	.229	.211	-.034	-.059	-.011	-.004	.101
Pre-TLFB #3	-.241	-.124	-.200	.074	.075	.014	-.022	-.102
Pre-TLFB #4	-.196	-.214	-.223	.104	.074	-.017	-.007	-.083
Pre-TLFB #5	-.215	-.100	-.155	.168	.115	.050	.124	-.009
Pre-TLFB #6	-.319	.014	-.101	.158	.153	.110	.189	.031
ASI #1	.126	.216	.154	-.018	.102	-.096	.066	.090
ASI #2	.260	.209	.170	.165	.186	.229	.250	.256
ASI #3	-.063	.153	.050	.325	.330	.402	.273	.275
ASI #4	.063	.169	.005	.234	.120	.013	.226	.169
ASI #5	-.032	-.010	-.139	.265	.137	.171	.199	.174
ASI #6	.089	.264	.124	.080	-.006	.074	.058	.071
ASI #7	-.111	.209	.120	.046	.113	.216	.001	.071
Enrollment status at 3-months	-.010	-.014	.010	.139	.115	.180	.111	.138
Total number of missed sessions	.070	.047	.187	-.215	-.170	-.146	-.182	-.120
Total possible sessions to attend	.054	.015	.073	.120	.102	.090	.136	.146
Total number of sessions attended	-.010	-.021	-.076	.227	.184	.160	.216	.181
Total number of positive UAs	.178	.008	.061	-.116	-.100	-.098	-.039	-.037

Positive UA status	.155	.008	.039	.029	.008	.024	.062	.124
TLFB #1	.182	.043	.131	-.034	-.106	-.018	-.162	-.179
TLFB #2	.107	.150	.154	.018	.029	.024	-.025	.042
TLFB #3	-.063	-.147	-.201	-.009	.031	-.041	.042	-.038
TLFB #4	-.052	-.152	-.196	.016	.014	-.034	.017	-.047
TLFB #5	-.035	-.118	-.169	.080	.069	.030	.066	-.013
TLFB #6	-.068	-.086	-.142	.078	.090	.068	.112	.038
Client evaluation of tx participation	-.053	.062	-.015	.224	.225	.108	.177	.133
Participation: Self-confidence	-.146	-.018	.022	.062	.236	.071	.114	.060
Participation: Motivation	-.074	-.035	-.088	.137	.124	-.023	.079	.039
Participation: Rapport	.024	.048	-.031	.079	.147	.029	.012	-.014

Notes:

Primary abuse problem: 1 = primarily alcohol-related, 2 = co-morbid with drug

Group assignment : 1 = MI group, 2 = C group

Gender: 1 = male, 2 = female

Recidivist status: 0 = first-time offender, 1 = recidivist

MAST category: 0 = social drinker, 1 = problem drinker

Enrollment status at 3-months: 0 = no longer attending, 1 = still attending

Positive UA status: 0 = all negative UAs, 1 = at least one positive UA

Table 16 (Part 3)

Simple Pearson Product-Moment Correlations Among All Study Variables

	Pre-TLFB #1	Pre-TLFB #2	Pre-TLFB #3	Pre-TLFB #4	Pre-TLFB #5	Pre-TLFB #6	ASI #1	ASI #2	ASI #3	ASI #4	ASI #5
Pre-TLFB #2	.321										
Pre-TLFB #3	-.224	-.686									
Pre-TLFB #4	-.232	-.809	.883								
Pre-TLFB #5	-.244	-.762	.637	.459							
Pre-TLFB #6	-.261	-.659	.419	.460	.827						
ASI #1	.199	.073	-.020	-.054	-.031	-.054					
ASI #2	.219*	.247	-.174	-.210	-.116	-.084	.231				
ASI #3	-.173	-.466	.333	.347	.501	.431	-.041	-.036			
ASI #4	-.081	-.246	.151	.223	.239	.147	.133	.136	.277		
ASI #5	-.235	-.339	.160	.168	.269	.325	-.085	-.134	.491	.211	
ASI #6	.042	-.075	-.069	.004	.069	.169	.186	.052	.138	.246	.302
ASI #7	-.148	-.113	.009	.017	.148	.161	.044	.122	.326	.150	.243
Enrollment status at 3-months	-.036	-.013	.063	-.028	.028	.057	-.041	.004	.145	.009	.278
Total number of missed sessions	.078	.079	-.027	.011	-.144	-.174	.069	.151	-.223	-.128	-.242
Total possible sessions to attend	-.016	.042	.088	.057	.013	-.050	-.015	.052	.028	-.068	.046
Total number of sessions attended	-.064	-.025	.078	.032	.106	.082	-.015	-.073	.180	.046	.205
Total number of positive UAs	.078	-.081	.011	.078	.109	.018	.004	.233	.022	.266	-.042
Positive UA status	-.043	-.068	-.051	-.008	.043	.015	-.080	.245	-.011	.176	.042
TLFB #1	.965	.344	-.239	-.252	-.264	-.276	.221	.175	-.186	-.093	-.225
TLFB #2	.208	.638	-.345	-.520	-.571	-.449	-.040	.091	-.341	-.236	-.192
TLFB #3	-.202	-.657	.376	.567	.587	.437	.057	-.030	.358	.295	.192
TLFB #4	-.195	-.667	.429	.672	.635	.415	.107	-.069	.315	.313	.135
TLFB #5	-.186	-.623	.429	.620	.671	.506	.114	-.001	.336	.300	.200
TLFB #6	-.203	-.590	.358	.467	.626	.556	.097	-.010	.409	.182	.278
Client evaluation of tx participation	-.166	.118	-.115	-.171	-.123	-.039	-.063	-.028	-.044	-.120	.040

Participation: Self-confidence	.027	-.010	-.076	-.038	-.010	-.022	.110	.004	.007	-.046	-.038
Participation: Motivation	-.118	-.020	.040	-.028	.059	.066	-.064	-.248	.133	-.062	.231
Participation: Rapport	-.056	-.002	.011	-.015	-.028	-.044	-.027	-.176	.082	.077	.042

Notes:

Primary abuse problem: 1 = primarily alcohol-related, 2 = co-morbid with drug

Group assignment : 1 = MI group, 2 = C group

Gender: 1 = male, 2 = female

Recidivist status: 0 = first-time offender, 1 = recidivist

MAST category: 0 = social drinker, 1 = problem drinker

Enrollment status at 3-months: 0 = no longer attending, 1 = still attending

Positive UA status: 0 = all negative UAs, 1 = at least one positive UA

Table 16 (Part 4)

Simple Pearson Product-Moment Correlations Among All Study Variables

	ASI #6	ASI #7	Enrollment status at 3-months	Total number of missed sessions	Total possible sessions to attend	Total number of sessions attended	Total number of positive UAs	Positive UA status	TLFB #1
ASI #7	.187								
Enrollment status at 3-months	.072	.058							
Total number of missed sessions	.020	-.005	-.494						
Total possible sessions to attend	-.022	-.169	.547	-.082					
Total number of sessions attended	-.029	-.111	.708	-.727	.744				
Total number of positive UAs	.164	.028	.102	.010	.112	.070			
Positive UA status	.136	.112	.108	.042	.065	.017	.703		
TLFB #1	.023	-.144	-.025	.045	-.041	-.058	-.115	-.120	
TLFB #2	-.042	-.200	.190	-.104	.131	.160	-.197	-.129	.284
TLFB #3	.021	.185	-.127	.048	-.066	-.078	.278	.174	-.279
TLFB #4	.054	.117	-.187	.097	-.075	-.117	.198	.091	-.242
TLFB #5	.038	.109	-.138	.015	-.055	-.048	.163	.084	-.226
TLFB #6	.065	.198	-.080	-.026	-.060	-.024	.112	.086	-.261
Client evaluation of tx participation	-.028	.018	.452	-.475	.314	.535	-.134	-.066	-.109
Participation: Self-confidence	.104	-.020	.093	.039	.069	.022	.042	-.048	.029
Participation: Motivation	-.009	-.041	.304	-.401	.311	.483	-.045	-.171	-.108
Participation: Rapport	-.016	-.059	.147	-.226	.166	.266	-.026	-.147	-.051

Notes:

Primary abuse problem: 1 = primarily alcohol-related, 2 = co-morbid with drug

Group assignment : 1 = MI group, 2 = C group

Gender: 1 = male, 2 = female

Recidivist status: 0 = first-time offender, 1 = recidivist

MAST category: 0 = social drinker, 1 = problem drinker

Enrollment status at 3-months: 0 = no longer attending, 1 = still attending

Positive UA status: 0 = all negative UAs, 1 = at least one positive UA

Table 16 (Part 5)

Simple Pearson Product-Moment Correlations Among All Study Variables

	TLFB #2	TLFB #3	TLFB #4	TLFB #5	TLFB #6	Client evaluation of tx participation	Participation: Self-confidence	Participation: Motivation
TLFB #3	-.913							
TLFB #4	-.888	.901						
TLFB #5	-.822	.856	.936					
TLFB #6	-.833	.829	.781	.879				
Client evaluation of tx participation	.330	-.273	-.271	-.188	-.178			
Participation: Self-confidence	.039	.021	.017	.013	.038	.164		
Participation: Motivation	.204*	-.142	-.136	-.046	-.003	.490	.484	
Participation: Rapport	.114	-.049	.003	.024	-.008	.383	.488	.671

Notes:

Primary abuse problem: 1 = primarily alcohol-related, 2 = co-morbid with drug

Group assignment : 1 = MI group, 2 = C group

Gender: 1 = male, 2 = female

Recidivist status: 0 = first-time offender, 1 = recidivist

MAST category: 0 = social drinker, 1 = problem drinker

Enrollment status at 3-months: 0 = no longer attending, 1 = still attending

Positive UA status: 0 = all negative UAs, 1 = at least one positive UA

Appendix J: Source Tables for Secondary Analyses (Modified Model 1)

(Including Primary Drug Problem)

Tables 17-31

Table 17

Source Table for Retention (Participant's treatment status at 3-month follow-up)

Effect	<i>df</i>	<i>F</i>	<i>p</i>
Group assignment	1, 82	.29	.593
Recidivist status	1, 82	.37	.545
Group assignment X recidivist status	1, 82	.07	.787
Motivation: problem recognition	1, 82	.47	.493
Motivation: treatment readiness	1, 82	1.27	.263
Motivation: desire for help	1, 82	.15	.701
Age	1, 82	.84	.361
Days between offense and intake	1, 82	.17	.677
Drug: alcohol vs. co-morbid	1, 82	.53	.468

Table 18

Source Table for Duration 1 (Total number of treatment sessions missed)

Effect	<i>df</i>	<i>F</i>	<i>p</i>
Group assignment	1, 81	3.52	.064
Recidivist status	1, 81	.54	.463
Group assignment X recidivist status	1, 81	.31	.579
Motivation: problem recognition	1, 81	.61	.437
Motivation: treatment readiness	1, 81	.34	.560
Motivation: desire for help	1, 81	.02	.882
Age	1, 81	.21	.649
Days between offense and intake	1, 81	.07	.786
Drug: alcohol vs. co-morbid	1, 81	.38	.537
Duration: total number of possible sessions to attend	1, 81	.15	.704

Table 19

Source Table for Duration 3 (Total number of treatment sessions attended)

Effect	<i>df</i>	<i>F</i>	<i>p</i>
Group assignment	1, 81	2.66	.107
Recidivist status	1, 81	.22	.640
Group assignment X recidivist status	1, 81	.61	.437
Motivation: problem recognition	1, 81	2.11	.151
Motivation: treatment readiness	1, 81	1.20	.277
Motivation: desire for help	1, 81	1.01	.317
Age	1, 81	.09	.766
Days between offense and intake	1, 81	.13	.716
Drug: alcohol vs. co-morbid	1, 81	.61	.439
Duration: total number of possible sessions to attend	1, 81	88.13	<.001

Table 20

Source Table for Compliance 1 (Total number of positive Urine Analyses during initial 3 months)

Effect	<i>df</i>	<i>F</i>	<i>p</i>
Group assignment	1, 82	.75	.388
Recidivist status	1, 82	4.06	.047
Group assignment X recidivist status	1, 82	.15	.701
Motivation: problem recognition	1, 82	.27	.602
Motivation: treatment readiness	1, 82	.66	.419
Motivation: desire for help	1, 82	.08	.779
Age	1, 82	.45	.506
Days between offense and intake	1, 82	1.21	.274
Drug: alcohol vs. co-morbid	1, 82	2.90	.092

Table 21

Source Table for Compliance 2 (At least 1 positive Urine Analyses versus no positive Urine Analyses)

Effect	<i>df</i>	<i>F</i>	<i>p</i>
Group assignment	1, 82	.49	.487
Recidivist status	1, 82	2.95	.090
Group assignment X recidivist status	1, 82	.06	.803
Motivation: problem recognition	1, 82	.00	.966
Motivation: treatment readiness	1, 82	.03	.865
Motivation: desire for help	1, 82	.00	.952
Age	1, 82	1.09	.301
Days between offense and intake	1, 82	.02	.887
Drug: alcohol vs. co-morbid	1, 82	2.30	.134

Table 22

Source Table for Treatment Participation (Client's self-evaluation of treatment)

Effect	<i>df</i>	<i>F</i>	<i>p</i>
Group assignment	1, 82	1.63	.206
Recidivist status	1, 82	.34	.562
Group assignment X recidivist status	1, 82	.37	.547
Motivation: problem recognition	1, 82	.22	.638
Motivation: treatment readiness	1, 82	.17	.685
Motivation: desire for help	1, 82	.91	.343
Age	1, 82	.30	.585
Days between offense and intake	1, 82	.49	.486
Drug: alcohol vs. co-morbid	1, 82	.96	.329

Table 23

Source Table for Client Participation (Self-confidence scale)

Effect	<i>df</i>	<i>F</i>	<i>p</i>
Group assignment	1, 82	5.92	.017
Recidivist status	1, 82	1.15	.287
Group assignment X recidivist status	1, 82	4.14	.045
Motivation: problem recognition	1, 82	5.69	.019
Motivation: treatment readiness	1, 82	1.01	.318
Motivation: desire for help	1, 82	13.83	< .001
Age	1, 82	.52	.475
Days between offense and intake	1, 82	.16	.690
Drug: alcohol vs. co-morbid	1, 82	.20	.659

Table 24

Source Table for Client Participation (Motivation scale)

Effect	<i>df</i>	<i>F</i>	<i>p</i>
Group assignment	1, 82	1.53	.219
Recidivist status	1, 82	.17	.684
Group assignment X recidivist status	1, 82	.64	.426
Motivation: problem recognition	1, 82	.06	.805
Motivation: treatment readiness	1, 82	1.29	.259
Motivation: desire for help	1, 82	.74	.393
Age	1, 82	.27	.606
Days between offense and intake	1, 82	1.58	.213
Drug: alcohol vs. co-morbid	1, 82	.04	.845

Table 25

Source Table for Client Participation (Rapport scale)

Effect	<i>df</i>	<i>F</i>	<i>p</i>
Group assignment	1, 82	1.93	.169
Recidivist status	1, 82	.09	.768
Group assignment X recidivist status	1, 82	1.33	.252
Motivation: problem recognition	1, 82	.94	.335
Motivation: treatment readiness	1, 82	.55	.462
Motivation: desire for help	1, 82	3.09	.082
Age	1, 82	.10	.749
Days between offense and intake	1, 82	.11	.737
Drug: alcohol vs. co-morbid	1, 82	.25	.618

Table 26-A

Source Table for Timeline Follow-back 1 (Total number of days since last drink)

Effect	<i>df</i>	<i>F</i>	<i>p</i>
Group assignment	1, 82	3.15	.080
Recidivist status	1, 82	2.34	.130
Group assignment X recidivist status	1, 82	.07	.796
Motivation: problem recognition	1, 82	15.52	< .001
Motivation: treatment readiness	1, 82	1.29	.260
Motivation: desire for help	1, 82	12.50	< .001
Age	1, 82	10.33	.002
Days between offense and intake	1, 82	99.95	< .001
Drug: alcohol vs. co-morbid	1, 82	3.85	.053

Table 26-B

Estimates (b), Standard Errors (SE), Odds Ratios and their 95% Confidence Intervals (CI) for Retention (Participant's treatment status at 3-month follow-up)

Group assignment	<i>b</i>	<i>SE</i>	Odds Ratio	95% <i>CI</i> for Odds Ratio
Problem recognition	.08953	.02272	1.0937	1.02554; 1.16186
Desire for help	-.08986	.02542	.9141	0.83784; 0.99036
Age	-.03306	.01029	.9675	0.93663; 0.99837
Time lapse between offense and intake	.00062	.00006	1.0006	1.00042; 1.00078

Table 27

Source Table for Timeline Follow-back 2 (Longest period of abstinence in days)

Effect	<i>df</i>	<i>F</i>	<i>p</i>
Group assignment	1, 81	1.19	.278
Recidivist status	1, 81	1.36	.247
Group assignment X recidivist status	1, 81	.05	.819
Motivation: problem recognition	1, 81	.46	.499
Motivation: treatment readiness	1, 81	.05	.827
Motivation: desire for help	1, 81	.54	.466
Age	1, 81	.82	.368
Days between offense and intake	1, 81	.17	.684
Drug: alcohol vs. co-morbid	1, 81	.37	.547
Baseline Timeline Follow-back 2 (Longest period of abstinence)	1, 81	47.44	<.001

Table 28

Source Table for Timeline Follow-back 3 (Longest total number of continuous days drinking)

Effect	<i>df</i>	<i>F</i>	<i>p</i>
Group assignment	1, 81	.09	.769
Recidivist status	1, 81	.08	.774
Group assignment X recidivist status	1, 81	.42	.521
Motivation: problem recognition	1, 81	.82	.367
Motivation: treatment readiness	1, 81	.08	.783
Motivation: desire for help	1, 81	.70	.404
Age	1, 81	.71	.401
Days between offense and intake	1, 81	.01	.926
Drug: alcohol vs. co-morbid	1, 81	1.84	.179
Baseline Timeline Follow-back 3 (Number of continuous days drinking)	1, 81	11.48	.001

Table 29

Source Table for Timeline Follow-back 4 (Total number of days drinking)

Effect	<i>df</i>	<i>F</i>	<i>p</i>
Group assignment	1, 81	.02	.891
Recidivist status	1, 81	.17	.677
Group assignment X recidivist status	1, 81	.21	.649
Motivation: problem recognition	1, 81	1.05	.308
Motivation: treatment readiness	1, 81	.12	.726
Motivation: desire for help	1, 81	.16	.692
Age	1, 81	.88	.351
Days between offense and intake	1, 81	.09	.763
Drug: alcohol vs. co-morbid	1, 81	3.14	.080
Baseline Timeline Follow-back 4 (Number of days drinking)	1, 81	52.94	< .001

Table 30

Source Table for Timeline Follow-back 5 (Total number of standard drinks)

Effect	<i>df</i>	<i>F</i>	<i>p</i>
Group assignment	1, 81	2.68	.105
Recidivist status	1, 81	.25	.620
Group assignment X recidivist status	1, 81	.09	.761
Motivation: problem recognition	1, 81	.00	.997
Motivation: treatment readiness	1, 81	.22	.637
Motivation: desire for help	1, 81	.09	.770
Age	1, 81	.59	.445
Days between offense and intake	1, 81	2.10	.151
Drug: alcohol vs. co-morbid	1, 81	.54	.466
Baseline Timeline Follow-back 5 (Number of standards drinks)	1, 81	56.98	< .001

Table 31

Source Table for Timeline Follow-back 6 (Most number of drinks in a single day)

Effect	<i>df</i>	<i>F</i>	<i>p</i>
Group assignment	1, 81	1.26	.266
Recidivist status	1, 81	1.39	.242
Group assignment X recidivist status	1, 81	.28	.599
Motivation: problem recognition	1, 81	.07	.790
Motivation: treatment readiness	1, 81	.04	.836
Motivation: desire for help	1, 81	.14	.708
Age	1, 81	.02	.884
Days between offense and intake	1, 81	.52	.474
Drug: alcohol vs. co-morbid	1, 81	1.43	.235
Baseline Timeline Follow-back 6 (Most drinks in a single day)	1, 81	34.08	< .001

Appendix K: Source Tables for Secondary Analyses (Modified Model 2)

(For Recent Offenders (n = 54), Including Primary Drug Problem)

Tables 32-47

Table 32

F- tests comparing “Recent” and “Non-recent” Offenders on All Dependent Variables

Variable	Recent (n=54)		Non-recent (n=44)		F (1, 96)*	p
	M (SD)	f (%)	M (SD)	f (%)		
<u>Pre-treatment variables</u>						
MAST total score	7.86 (4.03)		7.59 (3.94)		.11	.742
ASI Composite Scores						
Alcohol	.162 (.133)		.219 (.131)		2.44	.122
Drug	.034 (.133)		.029 (.047)		1.95	.166
Medical	.191 (.295)		.111 (.210)		4.50	.037
Employment /Support	.518 (.339)		.426 (.307)		.20	.659
Legal	.122 (.163)		.319 (.210)		24.97	< .001
Family/Social	.042 (.126)		.072 (.101)		1.66	.201
Psychiatric	.039 (.086)		.081 (.120)		3.73	.057
<u>Treatment Engagement</u>						
Retention: treatment status					5.37	.023
Still attending treatment		51 (94.4%)	34 (77.3%)			
No longer attending		3 (5.6%)	10 (22.7%)			
Duration 1: total no. of missed treatment sessions	1.80 (1.81)		2.39 (1.87)		4.07	.047
Duration 2: total no. of sessions possible to attend	10.94 (1.77)		10.61 (2.05)		.73	.394
Duration 3: total no. of treatment sessions attended	9.15 (2.45)		8.23 (3.04)		2.35	.128
Compliance 1: total no. of positive UAs	.20 (.53)		.55 (1.49)		7.32	.008
Compliance 2: at least one positive UA					1.00	.320
At least one positive UA		8 (14.8%)	10 (22.7%)			
No positive UAs		46 (85.2%)	34 (77.3%)			

<u>Treatment Participation</u>				
Client's evaluation of treatment	39.52 (7.99)	38.82 (9.48)	.93	.338
Counselor evaluation: Self-Confidence	3.29 (.60)	3.29 (.58)	.00	.989
Counselor evaluation: Motivation	3.61 (.77)	3.22 (.76)	6.15	.015
Counselor evaluation: Rapport	3.40 (.61)	3.31 (.58)	.61	.438
<u>Drinking Behaviors</u>				
TLFB: no. days since last drink	83.83 (70.85)	388.43 (663.51)	8414.13	< .001
TLFB: longest period of abstinence	23.67 (9.28)	25.02 (8.33)	1.84	.179
TLFB: no. continuous days drinking	.48 (.69)	.43 (.76)	.13	.719
TLFB: total no. days drinking	1.20 (1.93)	1.18 (2.48)	.01	.922
TLFB: total standard drinks	4.22 (7.21)	3.64 (8.53)	2.10	.151
TLFB: most drinks in single day	1.98 (3.11)	1.27 (2.34)	7.20	.009

*except *df* for MAST = 1,92 and *df* for ASI = 1,94

Table 33

Source Table for Retention (Participant's treatment status at 3-month follow-up)

Effect	<i>df</i>	<i>F</i>	<i>p</i>
Group assignment	1, 38	.00	.971
Recidivist status	1, 38	.00	.965
Group assignment X recidivist status	1, 38	.00	.969
Motivation: problem recognition	1, 38	.30	.585
Motivation: treatment readiness	1, 38	.01	.933
Motivation: desire for help	1, 38	.05	.826
Age	1, 38	.46	.501
Days between offense and intake	1, 38	.06	.807
Drug: alcohol vs. co-morbid	1, 38	.24	.628

Table 34

Source Table for Duration 1 (Total number of treatment sessions missed)

Effect	<i>df</i>	<i>F</i>	<i>p</i>
Group assignment	1, 37	1.90	.176
Recidivist status	1, 37	3.12	.086
Group assignment X recidivist status	1, 37	2.47	.125
Motivation: problem recognition	1, 37	.02	.900
Motivation: treatment readiness	1, 37	.39	.538
Motivation: desire for help	1, 37	.10	.754
Age	1, 37	.04	.838
Days between offense and intake	1, 37	.22	.640
Drug: alcohol vs. co-morbid	1, 37	.02	.893
Duration 2 (Total number of possible sessions to attend)	1, 37	.03	.860

Table 35

Source Table for Duration 3 (Total number of treatment sessions attended)

Effect	<i>df</i>	<i>F</i>	<i>p</i>
Group assignment	1, 37	.67	.418
Recidivist status	1, 37	1.52	.226
Group assignment X recidivist status	1, 37	2.41	.129
Motivation: problem recognition	1, 37	.20	.656
Motivation: treatment readiness	1, 37	.52	.474
Motivation: desire for help	1, 37	.01	.923
Age	1, 37	.12	.728
Days between offense and intake	1, 37	.15	.697
Drug: alcohol vs. co-morbid	1, 37	.03	.869
Duration 2 (Total number of possible sessions to attend)	1, 37	39.94	<.001

Table 36

Source Table for Compliance 1 (Total number of positive Urine Analyses during initial 3 months)

Effect	<i>df</i>	<i>F</i>	<i>p</i>
Group assignment	1, 38	.69	.411
Recidivist status	1, 38	3.26	.079
Group assignment X recidivist status	1, 38	.38	.540
Motivation: problem recognition	1, 38	.27	.604
Motivation: treatment readiness	1, 38	.11	.747
Motivation: desire for help	1, 38	.18	.670
Age	1, 38	3.79	.059
Days between offense and intake	1, 38	.01	.911
Drug: alcohol vs. co-morbid	1, 38	.05	.816

Table 37

Source Table for Compliance 2 (At least 1 positive Urine Analysis versus no positive Urine Analyses)

Effect	<i>df</i>	<i>F</i>	<i>p</i>
Group assignment	1, 38	.10	.751
Recidivist status	1, 38	4.36	.044
Group assignment X recidivist status	1, 38	.60	.443
Motivation: problem recognition	1, 38	1.87	.179
Motivation: treatment readiness	1, 38	.24	.630
Motivation: desire for help	1, 38	.01	.936
Age	1, 38	2.99	.092
Days between offense and intake	1, 38	.17	.678
Drug: alcohol vs. co-morbid	1, 38	.54	.467

Table 38

Source Table for Treatment Participation (Client's self-evaluation of treatment)

Effect	<i>df</i>	<i>F</i>	<i>p</i>
Group assignment	1, 38	.15	.697
Recidivist status	1, 38	.37	.547
Group assignment X recidivist status	1, 38	.16	.689
Motivation: problem recognition	1, 38	2.09	.157
Motivation: treatment readiness	1, 38	.83	.368
Motivation: desire for help	1, 38	3.82	.058
Age	1, 38	.21	.652
Days between offense and intake	1, 38	.96	.334
Drug: alcohol vs. co-morbid	1, 38	.00	.994

Table 39

Source Table for Client Participation (Self-confidence scale)

Effect	<i>df</i>	<i>F</i>	<i>p</i>
Group assignment	1, 38	4.73	.036
Recidivist status	1, 38	4.15	.049
Group assignment X recidivist status	1, 38	1.45	.237
Motivation: problem recognition	1, 38	4.24	.046
Motivation: treatment readiness	1, 38	1.81	.186
Motivation: desire for help	1, 38	5.87	.020
Age	1, 38	.56	.459
Days between offense and intake	1, 38	7.34	.010
Drug: alcohol vs. co-morbid	1, 38	2.29	.138

Table 40

Source Table for Client Participation (Motivation scale)

Effect	<i>df</i>	<i>F</i>	<i>p</i>
Group assignment	1, 38	1.27	.266
Recidivist status	1, 38	.69	.411
Group assignment X recidivist status	1, 38	.21	.650
Motivation: problem recognition	1, 38	.00	.977
Motivation: treatment readiness	1, 38	1.54	.223
Motivation: desire for help	1, 38	.26	.611
Age	1, 38	.32	.577
Days between offense and intake	1, 38	1.08	.305
Drug: alcohol vs. co-morbid	1, 38	.45	.508

Table 41

Source Table for Client Participation (Rapport scale)

Effect	<i>df</i>	<i>F</i>	<i>p</i>
Group assignment	1, 38	5.18	.029
Recidivist status	1, 38	.46	.500
Group assignment X recidivist status	1, 38	.38	.541
Motivation: problem recognition	1, 38	.63	.434
Motivation: treatment readiness	1, 38	.57	.455
Motivation: desire for help	1, 38	.87	.357
Age	1, 38	.01	.912
Days between offense and intake	1, 38	.49	.489
Drug: alcohol vs. co-morbid	1, 38	.64	.429

Table 42

Source Table for Timeline Follow-back 1 (Total number of days since last drink)

Effect	<i>df</i>	<i>F</i>	<i>p</i>
Group assignment	1, 37	.24	.626
Recidivist status	1, 37	.40	.531
Group assignment X recidivist status	1, 37	.04	.852
Motivation: problem recognition	1, 37	.00	.998
Motivation: treatment readiness	1, 37	.07	.795
Motivation: desire for help	1, 37	.05	.831
Age	1, 37	2.25	.142
Days between offense and intake	1, 37	1.07	.307
Drug: alcohol vs. co-morbid	1, 37	.00	.996
Baseline Timeline Follow-back 1 (Number of days since last drink)	1, 37	36.86	< .001

Table 43

Source Table for Timeline Follow-back 2 (Longest period of abstinence in days)

Effect	<i>df</i>	<i>F</i>	<i>p</i>
Group assignment	1, 37	.25	.623
Recidivist status	1, 37	.93	.341
Group assignment X recidivist status	1, 37	.30	.589
Motivation: problem recognition	1, 37	1.10	.301
Motivation: treatment readiness	1, 37	.03	.874
Motivation: desire for help	1, 37	1.52	.226
Age	1, 37	.80	.376
Days between offense and intake	1, 37	1.09	.303
Drug: alcohol vs. co-morbid	1, 37	.53	.471
Baseline Timeline Follow-back 2 (Longest period of abstinence)	1, 37	16.73	<.001

Table 44

Source Table for Timeline Follow-back 3 (Longest total number of continuous days drinking)

Effect	<i>df</i>	<i>F</i>	<i>p</i>
Group assignment	1, 37	.11	.743
Recidivist status	1, 37	.40	.529
Group assignment X recidivist status	1, 37	.02	.881
Motivation: problem recognition	1, 37	.11	.748
Motivation: treatment readiness	1, 37	.01	.910
Motivation: desire for help	1, 37	.50	.482
Age	1, 37	.74	.395
Days between offense and intake	1, 37	1.30	.262
Drug: alcohol vs. co-morbid	1, 37	.45	.507
Baseline Timeline Follow-back 3 (Number of continuous days drinking)	1, 37	.76	.388

Table 45

Source Table for Timeline Follow-back 4 (Total number of days drinking)

Effect	<i>df</i>	<i>F</i>	<i>p</i>
Group assignment	1, 37	.08	.778
Recidivist status	1, 37	1.18	.285
Group assignment X recidivist status	1, 37	.43	.517
Motivation: problem recognition	1, 37	.17	.687
Motivation: treatment readiness	1, 37	1.10	.301
Motivation: desire for help	1, 37	2.53	.120
Age	1, 37	1.25	.271
Days between offense and intake	1, 37	1.00	.324
Drug: alcohol vs. co-morbid	1, 37	1.99	.167
Baseline Timeline Follow-back 4 (Number of days drinking)	1, 37	5.20	.029

Table 46

Source Table for Timeline Follow-back 5 (Total number of standard drinks)

Effect	<i>df</i>	<i>F</i>	<i>p</i>
Group assignment	1, 37	2.61	.115
Recidivist status	1, 37	4.89	.033
Group assignment X recidivist status	1, 37	.29	.597
Motivation: problem recognition	1, 37	1.53	.224
Motivation: treatment readiness	1, 37	.46	.503
Motivation: desire for help	1, 37	3.12	.085
Age	1, 37	1.13	.295
Days between offense and intake	1, 37	.73	.397
Drug: alcohol vs. co-morbid	1, 37	2.48	.124
Baseline Timeline Follow-back 5 (Number of standards drinks)	1, 37	21.13	< .001

Table 47

Source Table for Timeline Follow-back 6 (Most number of drinks in a single day)

Effect	<i>df</i>	<i>F</i>	<i>p</i>
Group assignment	1, 37	.83	.367
Recidivist status	1, 37	2.14	.152
Group assignment X recidivist status	1, 37	.07	.793
Motivation: problem recognition	1, 37	.31	.581
Motivation: treatment readiness	1, 37	.19	.667
Motivation: desire for help	1, 37	1.29	.264
Age	1, 37	.02	.877
Days between offense and intake	1, 37	.36	.553
Drug: alcohol vs. co-morbid	1, 37	1.71	.199
Baseline Timeline Follow-back 6 (Most drinks in a single day)	1, 37	16.64	< .001

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