

**Symptoms of Depression, Symptoms of Anxiety, and Motivation for Treatment as
Predictors of Post-Substance Abuse Treatment Support Group Attendance:
A Path Analysis.**

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Abstract

In 2007, an estimated 22.3 million people in the United States, aged 12 or older, were classified as meeting the criteria for either substance dependence or abuse. Therapists have long sought to discover the most effective way to address these disorders in therapy; though short-term gains are often seen following inpatient or outpatient treatment, these gains often dissipate over time. Individuals who attend support groups such as Alcoholics or Narcotics Anonymous or SMART Recovery show much better prognoses over time than those who receive formal treatment alone. The current research is a secondary analysis of data collected by the Drug Abuse Treatment Outcome Study. A path analysis is conducted to examine the relationships between symptoms of depression, symptoms of anxiety, and motivation for treatment as they relate to post-treatment support group attendance. These variables form a path model which is analyzed so that each individual regression takes into account the other regressions in the model. Symptoms of depression are found to be significantly positive predictors of motivation for treatment, and motivation for treatment is found to be a significantly positive predictor of support group attendance. Implications of these findings for clinical practice and future directions for research are included in discussion of the results.

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CHAPTER I

INTRODUCTION

The Problem and its Setting

In 2007, an estimated 22.3 million people in the United States, aged 12 or older, were classified as meeting the criteria for either substance¹ dependence or abuse (Substance Abuse and Mental Health Services Administration, Office of Applied Studies, 2008). This figure, taken from the 2007 National Survey on Drug Use and Health, included 15.5 million people who were dependent on or abused alcohol, 3.7 million people dependent on or who abused illicit drugs, and 3.2 million people who were dependent on or who abused both (SAMHSA, 2008). The total number of individuals with substance use disorders, including both drugs and alcohol, equals nine percent of the United States population. It is estimated that over eight million children live with a parent who is either alcohol or drug dependent, or is in need of treatment for an alcohol or substance abuse problem (Huang, Cerbone, & Groerer, 1998).

A number of detrimental effects may occur from the abuse and dependence on drugs and alcohol. Excessive use of substances have been implicated in numerous medical complications, either from the direct effect of the substance, or from injuries sustained from accidents while intoxicated (Gmel & Rehm, 2003; Khalsa, 2007; National Institute on Drug Abuse [NIDA], 2007; Rehm, Gmel, Sempos, & Trevisan, 2002; World Health Organization [WHO], 2004). As well, diseases contracted from the use of intravenous drugs or from increased risky sexual activity associated with use can threaten

¹ For the purposes of this paper, the term “substance” will be used to refer to alcohol as well as both licit and illicit drugs of abuse. The term “substance use disorder,” abbreviated “SUD,” will refer to either a disorder of abuse or dependence.

the user's health and may prove to be fatal (Khalsa, 2007; NIDA, 2007). Those with substance use disorders may find themselves unable to fulfill essential life duties, such as vocational, educational, and family responsibilities (WHO, 2004). The monetary drain from job loss and cost of use can, at a minimum, deplete individual and family resources; at a more severe level, it can lead to homelessness as well as incarceration following crimes committed to obtain money to support one's habit (Higgins, Budney, & Sigmon, 2001; Mumola & Karberg, 2006; Snyder, 1996; United States Conference of Mayors, 2008). One's family may be further affected through child neglect as well as domestic violence, both of which are correlated with abuse and dependence (Child Welfare Information Gateway, 2009; Fals-Stewart, 2003; Fals-Stewart, Golden, and Schumacher, 2003; Moore & Stuart, 2004; Murphy et al., 2001; Murphy et al., 2005; Parrott et al., 2003; Stuart et al., 2008; United States Department of Health and Human Services, 1999).

As is evident in the preceding paragraph, the stakes are extremely high with regards to substance abuse and dependence; it is no wonder that how to best overcome these problems has been the subject of much study. The therapeutic community has approached the problem through a wide variety of interventions, both in terms of specific techniques employed by therapists, as well as treatment settings that will best aid individuals with SUDs in recovery. In addition, a multitude of support groups exist that are aimed to assist individuals in recovery from SUDs. Certainly, there is no magic formula that would best serve all people with substance use disorders. For one, dependence may differ from substance to substance. Also, users may not be

homogeneous with regards to abuse and dependence; what “works” for one individual may not work for another individual.

With regards to mental health professionals’ role in the recovery process, the most basic question that one asks may be, “Does therapy work?” In other words, is the influence of addiction appreciably less after an individual participates in treatment than had he² not undergone treatment at all? There are a number of measures that one may use to gauge the effectiveness of treatment. The most common of these measures in the research literature are a reduction in substance use or abstinence from a substance, a reduction in substance use-related problems, or a reduction in symptoms of abuse and dependence. On this account, at least with regards to short-term gains, the answer appears to be, “yes;” a variety of types of substance abuse treatments have been shown to make a positive difference in use-related outcomes (see Hubbard, Craddock, Flynn, Anderson, & Etheridge, 1997; Moos & Moos, 2003; Project MATCH Research Group [PMRG], 1997a). In particular, individuals undergoing therapy for addiction appear to use less of their substance of choice, have higher rates of abstinence, have fewer substance use-related problems, and have fewer symptoms of dependence following treatment than prior to treatment; these gains appear to be consistent for the first year following treatment.

However, a much bleaker picture emerges once we look at these outcomes over longer periods of time. Rates of relapse from clinical populations are estimated to be between 50 and 90 percent (Brownell, Marlatt, Lichtenstein, & Wilson, 1986). Many of

² Unless otherwise noted, gender specific terms, such as “he,” “she,” “him,” or “her” should be considered referential to any person, male or female; the use of pronouns is meant to improve the readability of the paper rather to specifically refer to a particular gender.

the same studies that indicated positive first-year results showed much poorer outcomes when following participants over longer stretches of time. Practitioners often see their clients return again and again; after short-term gains are made and clients appear to have turned a corner in their struggle with substance use, it seems that the initial progress made in therapy is lost. Substance dependence begins to look like a chronic problem, one in which a person must struggle with over his entire life.

An increasingly large body of research suggests that participation in self-help programs or support groups, such as Alcoholics Anonymous, Narcotics Anonymous, or SMART Recovery, has a positive impact on the likelihood that an individual will maintain the gains initially made in formal treatment (Etheridge et al. , 1999; Fiorentine, 1999; Gossop et al. , 2003; Gossop, Stewart, & Marsden, 2007; McKellar, Stewart, & Humphreys, 2003; Montgomery, Miller, & Tonigan, 1995; Moos & Moos, 2004; 2005; 2006a; 2006b). These gains have been measured in similar ways to those in assessing the effects of therapy for SUDs, such as rates of abstinence, reduction in substance-related problems, and reduction in substance use, and have been shown to apply to individuals struggling with dependence to both alcohol and illicit drugs. Furthermore, participation in self-help groups appears to have longer-reaching impact; follow-up surveys one (Etheridge et al., 1999), two (Fiorentine, 1999; McKellar, Stewart, & Humphreys, 2003), five (Gossop, Stewart, & Marsden, 2007), eight (Moos & Moos, 2004), and sixteen years (Moos & Moos, 2005, 2006a) after an individual first entered treatment have shown that participation in self-help groups greatly reduces the likelihood of relapse. Positive gains appear to be related to the frequency of meeting attendance (Etheridge et al., 1999; Fiorentine, 1999, Gossop et al., 2003, Gossop, Stewart, & Marsden, 2007, Moos & Moos,

2004, Moos, Schaefer, Andrassy, & Moos, 2001), the duration of attendance (Moos & Moos, 2004; 2005; 2006b), and the level of involvement in a given program (McKellar, Stewart, & Humphreys, 2003; Montgomery, Miller, & Tonigan, 1995) in that those individuals who attend more meetings per week, who attend for longer periods of time, and are more involved in program activities seem to be least likely to relapse.

It is likely that some expectations regarding treatment and self-help groups affect how individuals approach each of these endeavors. Though the length of time that one spends in treatment may differ from program to program, it is expected by both clients and clinicians that, at some point, formal treatment will end. This is not the case with many self-help groups; despite the emphasis on the “12 steps” in the Anonymous programs, it is not anticipated that, once the steps are completed, participation in AA or NA will end; participation is often viewed as a life-long commitment. However, even those who attend for some time following treatment and then leave these programs show better outcomes than those who attend formal treatment and do not participate in self-help groups at all (Moos & Moos, 2006). The particulars regarding the frequency and duration of self-help group attendance needed to impact change will be discussed in the literature review section of this paper.

Mental health and substance abuse professionals have long known the positive impact that self-help groups can make, and often will encourage clients to attend meetings while in treatment as well as following treatment. Some treatment interventions, such as the “twelve-step facilitation” model described in the Project MATCH study (PMRG, 1997a), are specifically designed to “prep” clients for ongoing participation in the Anonymous programs. As well, some self-help groups hold meetings

within the same structure as detoxification or inpatient treatment centers, encouraging participation while still in formal treatment.

However, despite the encouragement of mental health professionals through the means described above, and despite indications that support groups do help individuals with SUDs, many individuals participate in and complete formal treatment but do not go on to participate in any form of aftercare. Quite a range exists among published studies of the percentages of participants who attend support groups following a period of treatment, from as few as 20% of participants (Gossop et al., 2007) to as many as 75% (Watson et al., 1997). This variation may perhaps be due to the population drawn from each individual study or perhaps by the level of encouragement for participation in support groups given in the treatment programs utilized in these studies. However, the majority of studies involving post-treatment participation in support groups indicate that about half of those individuals that participate in treatment go on to participate in self-help groups after treatment is terminated (e.g., Fiorentine et al., 1999; Gossop et al., 2003; Mueller et al., 2007; PMRG, 1997a). Furthermore, with regards to Alcoholics Anonymous, about half of those individuals who initially participated in this program (regardless of whether they had previously sought formal treatment) drop out within the first three months (Fiorentine, 1999).

An initial willingness to participate in treatment suggests that an individual has at least some motivation to seek help with the problem of a substance use disorder, if for no other reason than to avoid further problems related to use (though not necessarily to suspend use entirely). Given the increased likelihood of success associated with post-treatment support group attendance, the question remains of why some individuals do not

take this additional step. Little is known about what might lead one individual to attend substance-use related support groups following treatment and what might lead another individual to not do so. Do factors exist that encourage or discourage a person to attend support groups? This study seeks to examine the ability to predict post-treatment attendance of support groups among individuals who initially seek formal treatment. The study will test the power of several pretreatment characteristics of clients seeking treatment for substance abuse problems to predict attendance in support groups following treatment.

It would be difficult to create an exhaustive list of characteristics that an individual possesses that might possibly influence support group attendance. Many demographic and sociocultural characteristics, such as age, profession, education, income, race, and so on, may be found to correlate with attendance, and could possibly be used to create a profile for a “typical” support group attendee. A therapist could view such a list as identifying risk factors for non-attendance. However, the current study will examine several key characteristics which lend themselves well to intervention in therapy. In particular, this study will examine the relationship between pretreatment depressive symptoms, symptoms of anxiety, and an individual’s level of motivation for substance abuse treatment as they relate posttreatment support group attendance.

The knowledge of specific barriers to participation may allow clinicians to provide encouragement to participate in support groups beyond the methods already employed. For example, if it is known that clients who show greater depressive symptoms are less likely to seek additional support after formal treatment ends, clinicians may be more attuned to depressive symptoms amongst clients with SUDs. As well, they

may be better able to intervene with regards to depression, and thus make the transition from formal to informal treatment easier for clients who would otherwise be more inclined to discontinue help-seeking after formal treatment is terminated. Through the use of treatment interventions that better address those aspects which may prevent an individual from participation in aftercare, clinicians may help the individual to sustain and further gains made in formal treatment after formal treatment is concluded.

This study will employ the data collected through the Drug Abuse Treatment Outcome Study [DATOS] (Flynn et al., 1997) to identify specific variables that may be used to predict post-treatment support group attendance. DATOS was the third in a series of large-scale studies aimed at evaluating the effectiveness of substance abuse treatment, collecting data from participants entering treatment for substance use disorders between the years 1991-1993 (Flynn et al., 1997). It was preceded by the Drug Abuse Reporting Project (DARP), which surveyed participants entering treatment between 1969-1973, and the Treatment Outcome Prospective Study (TOPS), which collected data between 1979-1981 (Fletcher, Tims, & Brown, 1997).

Over 10,000 clients entering drug treatment in 96 programs from 11 cities were initially interviewed as part of the DATOS study (Flynn et al., 1997). At intake, participants were interviewed on a wide variety of subjects, including information regarding substance use, background and demographic information, and personal characteristics. Data were collected from several program types, including short-term inpatient treatment, outpatient methadone treatment, drug-free outpatient counseling, and long-term residential counseling (Etheridge et al., 1997). A follow-up sample of participants were interviewed one year and five years following treatment (Hubbard et

al., 1997; Hubbard, Craddock, & Anderson, 2003). At these points in time, participants were surveyed regarding their drinking and drug use habits, as well as their participation in self-help groups (Etheridge et al., 1999; Hubbard et al. , 1997; Hubbard et al., 2003). It was found that, twelve months following treatment, those participants who participated in a residential program and who attended an average of two or more meetings per week throughout the follow-up period showed significantly reduced odds of relapse (Etheridge et al.,1999).

In the current analysis of data from the DATOS project, the author will examine the relationship between depressive symptoms, anxious symptoms, and motivation for SUD treatment as they relate to post-treatment support group attendance. It is the author's hope that, through this secondary analysis of this dat set, some light will be shed on the addiction process, clients' characteristics that may encourage or discourage participation in aftercare activities, and how clinicians may best serve their clients to encourage the seeking of informal help after formal treatment reaches its end.

Significance

A myriad of studies, such as those referenced in the previous section, have shed light on the benefits of formal treatment in aiding in recovery from addiction, as well as the benefits of self-help groups following a period of formal treatment. Given the outcomes from these previous studies, it is assumed that both formal treatment and informal support groups are of benefit to clients in overcoming substance use disorders. Also assumed is that the combined efforts of both a regimen of formal treatment, concurrent with and followed by a regimen of participation in support groups, offer the best prognosis for recovery from SUDs.

As in the current study, several studies have examined the factors by which individuals affiliate with 12-Step groups in general, and Alcoholics Anonymous in particular (e.g., Brown, O'Grady, Farrell, Flechner, & Nurco, 2001; Morgenstern, Labouvie, McCrady, Kahler, & Frey, 1997; Tonigan, Bogenschutz, & Miller, 2006); these are similar to the current research in that they draw their participants from treatment populations. However, several limitations of these studies, as well as differences in variables, set the current research apart and make it a unique contribution to substance abuse treatment literature. The work of Tonigan et al. (2006), in an analysis of data drawn from Project MATCH, contains a fairly large sample size (454 participants); however, the aim of Tonigan and colleagues' work is different from the current research in that it sought to determine whether drinking typology affected affiliation with Alcoholics Anonymous. The typologies used in this study (labeled "Type A" and "Type B") were based on Babor et al.'s (1992) classifications of problem severity (with Type B designated as a more severe form of SUD). In this analysis of the Project MATCH data, alcoholism typology was determined through an assessment of family history of alcoholism, dependence symptoms, and symptoms of antisocial personality disorder (Tonigan et al., 2006).

Morgenstern et al. (1997) studied a relatively small sample (100 participants), and focused more on the relationship between participants' cognitive processes as they related to participation in Alcoholics Anonymous. Both the study of Tonigan et al. and Morgenstern et al. were limited to the treatment of alcoholism and participation in Alcoholics Anonymous; drug addiction and its treatment were beyond the scope of these studies. The research of Brown et al. (2001) is most closely related to the current study

in that it examines a number of personal characteristics, such as religiosity, feelings of hopelessness, and depression as they relate to frequent or infrequent attendance in 12-Step meetings. However, this study is limited in that it included a relatively small sample size (71 participants total), drew their sample from one community (Baltimore), focused on one treatment delivery type (outpatient therapy), and whose participants were all mandated to treatment through the criminal justice system (Brown et al., 2001).

The current study will employ a sample that exceeds the size of any of the above studies, examining data provided by 1533 participants. The current study also draws its sample from a wide variety of treatment types and from a wide variety of locations throughout the United States. Survey questions pertained to participation in all types of support groups aimed at helping people with substance abuse problems (rather than limiting responses to participation in Alcoholics Anonymous). Finally, two of the three studies described above were aimed at alcohol use disorders; the current research will build on these studies by examining individuals suffering from disorders of drug abuse.

Rationale

This study attempts to expand on the work of Brown and colleagues (2001) through the use of a data set that can be better generalized to the treatment population as a whole, and can account for a greater variety of treatment types. From the original participant pool, after eliminating those participants who had not completed all questionnaires as well as those from programs that had low numbers of admissions, 2,966 clients were surveyed at the 1-year follow-up (Hubbard et al., 1997). As well, the fact that data were drawn from a variety of treatment types, including long-term residential treatment, short-term inpatient treatment, outpatient therapy, and methadone

maintenance, helps to generalize the study findings to a broader range of types of treatment.

Participants in the DATOS study were interviewed on a wide variety of topics, among which were demographic characteristics, level of education, income, amount of drug use, and religiosity (Flynn et al., 1997). Despite the possibility that the analysis of variables such as these could aid in creating a “profile” for the post-treatment support group attendee, this study seeks to examine variables in which clinicians may have a greater opportunity upon which to intervene. The variables of symptoms of anxiety, symptoms of depression, and motivation and readiness for substance abuse treatment are fairly self-explanatory in this regard; a number of therapeutic models and techniques exist in the aid and treatment of these issues. The presence of depressive symptoms, particularly a lack of interest in activities for most of the day nearly every day (APA, 2000), may influence the likelihood of participation in self-help groups; this feature may also indirectly influence participation through an effect on the variable of motivation and readiness for treatment. The presence of greater symptoms of anxiety may similarly affect an individual’s readiness for treatment, as making changes to one’s life may bring about greater discomfort; this characteristic may also affect participation in support groups directly, if increased anxiety surrounding meeting attendance leads an individual to avoid these situations. Though certainly gains on all these variables may be made through participation in self-help groups, there may be a threshold that individuals must cross in order for the benefits of support groups to take hold. Deficits in these areas may lead some individuals to initially attend and then drop out, or may lead others to avoid attendance altogether.

From a competing viewpoint, individuals who are more depressed or anxious may be in enough distress that they may more readily take action to make changes in their lives. One such change may be to join a support group in an attempt to change one's behaviors surrounding substance use. Consequently, one who does not experience depression or anxiety may be less likely to see her use as a problem, and therefore may be less likely to do anything to change this behavior. Finally, these two points of view may not necessarily be mutually exclusive; individuals might need the "right" amount of distress in order to fully reap the benefits of support groups. However, without the benefit of an analysis such as the current study, clinicians cannot know which of these points of view has the most merit. Through the current study, we may be able to shed light on the relationship between these individual characteristics and seeking support for recovery after formal treatment ends.

Theoretical Background

This study leans heavily on the transtheoretical model proposed primarily by James Prochaska and Carlo DiClemente (see Prochaska & DiClemente, 1982 and Prochaska, DiClemente, & Norcross, 1992). This model examines *how* people change a problem behavior, such as substance dependence, and proposes a series of steps and processes that an individual, either in treatment or not, goes through in order to change; the model is not as concerned as to *why* such a process exists (Prochaska & DiClemente, 1982, Prochaska, DiClemente, & Norcross, 1992). These steps begin with an individual not thinking of his behavior as a problem, proceeding through contemplating making a change, through making a decision to change and beginning some small efforts to do so, to taking action to make a change, and finally to efforts to maintain the changes

(Prochaska, DiClemente & Norcross, 1992). These authors have described, as is further evident from literature on relapse, that change does not necessarily occur in a linear fashion; rather, individuals will often revert to earlier stages throughout their efforts to change a behavior (Prochaska, DiClemente & Norcross, 1992).

Guiding the current research is the observation by Prochaska et al., (1992) that the progress that a client makes in formal treatment appears to be based in the pretreatment stage of change in which she enters therapy. Participation in self-help groups, at least at some level, requires some sort of *action*, even if that action consists of getting a schedule of meetings, planning one's schedule so that one may be able to attend, and driving or arranging transportation to the meeting. Continued participation in support groups may be part of the *maintenance* activities that an individual engages in to help ensure continued success. Many individuals coming into therapy – and as well, coming out of therapy, may not be in the *action* stage as described in this model. The current research proposes to test whether individuals who come into therapy “less ready” for treatment (ie, in the precontemplation or contemplation stages described by Prochaska et al. [1992]) are less likely to attend support groups following treatment. Further, Prochaska et al. (1992) observed that, among a number of processes that individuals engage in throughout efforts to change a behavior, those in the *action* stage rely more heavily on support from helping relationships than individuals in earlier stages of change. This would also suggest that support groups may be better geared towards individuals who are in this particular stage of changing a behavior.

Beyond examining the specific construct of an individual's stage of change, this research also relies on the transtheoretical model of change with regards to other client

factors which may influence the likelihood of participation in support groups following treatment. The crux of the current research is epitomized in Prochaska et al., (1992): “There are multiple interventions but little integration across theories. One promising approach to integration is to begin to match particular interventions to key client characteristics” (p. 1108). The current research attempts to identify several of these key client characteristics that may predict participation in support groups following treatment. It also builds on and furthers the transtheoretical model by attempting to identify client characteristics that may influence an individual’s stage of change, which may in turn influence participation in support activities following treatment.

Purpose of the Study

This study will examine the relationship between characteristics that an individual may have coming into therapy, and how these characteristics affect their engaging in aftercare. Through looking at the characteristics that those who leave treatment to participate in self-help groups hold, we may inform our practices in how to best serve our clients in treatment. Thus, the following question will guide the current research: “What individual characteristics predict one’s post-treatment participation in self help groups?” Rather than examine demographic characteristics in which a clinician has little ability on which to intervene, the current research is focused on several issues which commonly present themselves in therapy. This researcher will test an overall model based on available literature regarding the relationships between depression, anxiety, motivation to change, and support group attendance to help describe how these variables interact with one another to predict who may and who may not attend support groups following treatment. As well as examining the ability of each variable to predict attendance, the

variables of interest will also be examined regarding their ability to predict each other. It is this author's hope that a model of prediction can be created that can best describe how these variables influence support group attendance.

CHAPTER II

LITERATURE REVIEW

This section will review previous research pertinent to the current study. It will begin with a review of three larger multi-site outcome studies that measure the effectiveness of formal drug and alcohol treatment. These studies will be examined for both short and long term gains that participants derive from participation in therapy. This review will then turn to an examination of the effectiveness of support groups in helping individuals recover from SUDs at the conclusion of formal treatment. Finally, this chapter will examine previous literature regarding the effect of the variables of interest in this study – symptoms of depression, symptoms of anxiety, and motivation and readiness for treatment – on the likelihood of participation in substance use-related support groups. As well, this author will review literature pertaining to the relationship between motivation and symptoms of anxiety and depression. Through this review, the author hopes to compose an overall picture of how these variables may interact with one another to increase or decrease the likelihood of support group attendance.

Formal Treatment and Substance Use Outcomes

The effectiveness of therapy in helping individuals recover from substance use disorders has been the subject of countless studies. For the purposes of the current study, three such projects – the Project MATCH (Matching Alcohol Treatment to Client Heterogeneity) study (Project MATCH Research Group [PMRG] (1997a, 1997b, 1998a, 1998b), research conducted at the Center for Health Care Evaluation (Timko, Moos, Finney, & Moos, 1995; Moos & Moos, 2003, 2004, 2005, 2006), and the DATOS (Drug Abuse Treatment Outcome Study) project (Etheridge, Craddock, Hubbard, & Rounds-

Bryant, 1999; Etheridge, Hubbard, Anderson, Craddock, & Flynn, 1997; Flynn, Craddock, Hubbard, Anderson, and Etheridge, 1997; Hubbard, Craddock, & Anderson, 2003; Hubbard, Craddock, Flynn, Anderson, & Etheridge, 1997) - will be reviewed.

These three studies share the commonalities of having relatively high numbers of participants and draw data from a number of different treatment sites. Through using these methods in their studies, these outcomes can be more greatly generalized to the population of individuals with SUDs as a whole than can studies in which samples are drawn from a more restricted population.

Though each of these studies examined treatment in a unique way, the overlying questions of each could be stated as, “Is treatment of substance abuse effective?” Effectiveness can be measured in a variety of ways, but typically is related to a reduction or total abstinence in the use of a given substance and/or a reduction in negative consequences as related to use of a substance. Assuming that treatment improves the outcomes with regards to these measures, each study takes a different approach in answering the question, “In what way is treatment effective,” or, “what are the specific variables that bring about positive results?” The following is a description of each of these three studies, the overall effectiveness of treatment, and findings of the particular aspects of drug and alcohol treatment illuminated by this research. Treatment outcomes are examined both in terms of short-term and long-term gains.

Project MATCH

Project MATCH was a study initiated in 1989 by the National Institute on Alcohol Abuse and Alcoholism; the primary purpose of the study was to test whether particular modes of therapy were better suited for alcohol-dependent individuals with

particular characteristics (PMRG, 1997a). This study took the stance that not all individuals with alcohol use disorders fit into one typology. To this end, the study randomly assigned participants to three different types of manualized treatments commonly used in the treatment of alcoholism: Cognitive-Behavioral Therapy (CBT), Twelve-Step Facilitation Therapy (TSF), and Motivational Enhancement Therapy (MET); each of these methods of intervention were administered over a 12 week period. CBT and TSF treatment held sessions weekly, for a total of 12 sessions during the treatment period, while MET sessions were held every three weeks, for a total of 4 sessions over the treatment period.

The Project MATCH study examined outcomes through two separate measures: Percentage of Days Abstinent (PDA) and Drinks per Drinking Day (DDD) (PMRG, 1997a). Participants were interviewed at intake regarding their drinking habits in the three months prior to seeking treatment. Follow-ups regarding drinking habits then took place immediately following treatment, 15 months following treatment, and three years following treatment (PMRG 1997a, 1998a). Results were presented for two “arms” of the study, those clients in outpatient treatment and those clients in aftercare treatment.

Very few of the hypotheses set forth by the research group regarding matching client characteristics to treatment types were supported by the data, at either the immediate post-treatment point or at the 15-month follow-up (PMRG, 1997a). However, this study lent much support to the effectiveness of short-term treatment in general. At intake, participants were abstinent an average of 20%-25% of days for the 3 months prior to treatment. Immediately following treatment, regardless of treatment type, participants were abstinent 80%-90% of days. Regarding DDD, participants averaged between 11

and 20 drinks at intake; immediately following treatment, DDD had dropped to an average of 1-3 drinks. 15 months following treatment, the overall PDA had only slightly decreased, and the average DDD had only slightly increased.

The 3-year follow-up to the original study included only those participants in the outpatient arm, due primarily to the fact that these participants had not received any other form of treatment immediately prior to the project; by limiting the follow-up to these participants, the investigators hoped to also limit the influence of treatment other than those administered through the study (PMRG, 1998a). Apart from retesting the originally-proposed matching hypotheses, the follow-up study also examined whether, overall, participants had retained the gains seen at the posttreatment and 15-month marks with regards to abstinence and drinks on a drinking day. In looking at the sample as a whole, only 29.4% of participants were abstinent for the entire 3 months preceding the interview. This 3-year follow-up also found that, when eliminating abstainers from the sample, those participants who drank did so on average of 3 days per week, and drank an average number of 6.24 drinks per drinking day.

Center For Health Care Evaluation Study

A study conducted by the Center for Health Care Evaluation (hereafter referred to as the CHCE study), operated by the Department of Veterans' Affairs and Stanford University, examined participants seeking treatment for alcohol-related problems who had not previously received formal treatment (Finney and Moos, 1995). Though the CHCE study has a smaller sample size and did not have the geographic diversity of the other two studies reviewed in this section, it does have the advantage of a control group, in which untreated individuals could be compared to treated individuals (Moos & Moos,

2003). Drinking outcomes were measured through reported abstinence, drinking-related problems, and symptoms of dependence.

With regards to these three measures, this study found that, one year after the initiation of treatment, individuals who received 27 weeks or more of treatment made statistically significant improvements in all three of these areas (Moos & Moos, 2003). However, those who attended less than 27 weeks of treatment in this first year did not make significant improvements in the three measured drinking outcomes; outcomes for this group were similar to those who received no treatment at all. Interestingly, the frequency of treatment (be it less than one, one to three, or more than three times per week) did not significantly influence drinking outcomes.

In subsequent interviews and analyses of this sample, participants were considered to be “remitted” if, for the six months prior to interview, they had abstained from alcohol or had light to moderate drinking patterns and had no drinking-related problems, and for one month prior to the interview, had not consumed more than 3 ounces of ethanol in one day (Moos & Moos, 2006b). Those not meeting these criteria were considered relapsed. In a subsequent analysis of the sample, participants who were considered remitted at the 3-year mark were re-interviewed at the 16-year mark; participants from the control (who had not received treatment in the first year after contact with the researchers) were compared with the experimental participants (those who had received treatment during the first year of the study). Based on this analysis, those who had received treatment in the first year did in fact have significantly lower rates of relapse. *However*, among those who had received treatment in the first year of the study, 42.9% had experienced a relapse by year 16 of the study.

DATOS

The Drug Abuse Treatment Outcome Study (DATOS) was a multisite, multicity project that surveyed individuals admitted into drug treatment programs between the years 1991 and 1993 (Flynn et al., 1997). The purpose of this study, as stated in Flynn et al. (1997) was to “provide comprehensive information on continuing and new questions about the effectiveness of drug abuse treatment currently available (p. 230).” DATOS was the third in a series of nationwide studies aimed at describing substance abuse treatment in the United States; it was preceded by the Drug Abuse Reporting Project (DARP), and the Treatment Outcome Prospective Study (TOPS), noted in Chapter I of this paper (Fletcher, Tims, & Brown, 1997).

The DARP study originally began as a proposal by researcher Saul Sells to the National Institute of Mental Health as a means to evaluate and monitor treatment programs receiving federal funding (Fletcher et al., 1997). The proposal was made in response to a rise in heroin addiction in the United States. The study included approximately 44,000 clients entering 52 treatment programs; programs represented in the study included outpatient methadone treatment, therapeutic communities, outpatient drug-free treatment, and detoxification programs (Fletcher et al., 1997). The study also included as a comparison group individuals who were "intake only," ie, those who applied for one of these programs and completed the study survey, but who never returned for treatment. A significant reduction in daily opioid use was found amongst participants in three of the four treatment types (with the exception being those in detoxification programs) as compared to "intake only" participants. Other significant findings were that when *no* drug use and *no* predatory criminal behavior were used as

criteria, those individuals staying in treatment for 90 days or more had significantly better outcomes than those who were either "intake only" or those who were in treatment less than 90 days; the latter of these groups showed no better outcomes than those who did not receive treatment at all (Fletcher et al., 1997).

The TOPS program sought to expand on the work of DARP by collecting a greater amount of information on client characteristics, services delivered in treatment, and the environments of participant programs (Fletcher et al., 1997). This project included more than 11,000 participants from 41 treatment programs in 10 cities. Detoxification programs were not surveyed during this study; outpatient drug-free, methadone maintenance programs, and long term residential programs (surveyed in DARP as "therapeutic communities") remained. As in DARP, the TOPS study found a significant reduction in the use of heroin and other drugs, as well as predatory crimes, following treatment in all program models (Fletcher et al., 1997). TOPS also discovered a change in drug use patterns; more participants reported using multiple substances rather than strictly heroin, and more participants reported using heroin on less than a daily basis. However, 77% of participants still reported heroin as their primary drug of abuse. (For a more thorough review of the DARP and TOPS projects, the reader can refer to Simpson & Sells [1982] and Hubbard et al. [1989]).

The years between the TOPS and DATOS studies saw a number of changes to the environments of both drug use and treatment. While heroin use declined, these years saw the rise of crack cocaine, whose popularity has been attributed to its being cheaper and more potent than its powder variety. Many suffering from dependence to crack were admitted to short-term inpatient programs, a model of treatment that had not been very

well studied. Also during these years came the onset of the AIDS epidemic. This lethal disease was particularly common among intravenous drug users, which necessitated the introduction of efforts to stop the spread of AIDS into drug treatment. Finally, federal funding of drug treatment programs declined during the years between the TOPS and DATOS studies. Therefore, changes in treatment, changes in use patterns, and the threat of AIDS among users brought in to question the applicability of the findings of DARP and TOPS to the current conditions of treatment (Fletcher et al., 1997). It was for these reasons that a new nationwide survey, DATOS, was initiated.

Four different types of treatment programs participated in DATOS; these included long-term residential facilities (LTR), short-term inpatient facilities (STI), outpatient drug-free treatment (ODF), and methadone maintenance treatment (OMT) (Etheridge et al., 1997). Participants were surveyed at intake, during treatment, twelve months following treatment, and five years following treatment (Flynn et al., 1997; Hubbard et al., 2003). At each of these points, participants were surveyed regarding their use of heroin, cocaine, marijuana, and alcohol (Hubbard et al., 1997). The level set for detrimental use of these substances was weekly use for heroin, cocaine, and marijuana, and weekly consumption of 5 or more drinks at one sitting for alcohol (Hubbard et al., 1997). Outcomes were measured by the percentage of participants that met these criteria in the year prior to intake as compared to the percentages of participants that met these criteria at the follow-up. Results were reported by treatment site type. Significant results from this analysis, as reported in Hubbard et al., 1997, were as follows:

- For the OMT sites, there was a significant reduction in the percentage of participants using heroin and cocaine on a weekly basis.

- For the LTR sites, there was a significant reduction in the percentage of participants using all four of the surveyed drugs on a weekly basis.
- For the ODF sites there was a significant reduction in the percentage of participants using cocaine, marijuana and alcohol (5 or more drinks at a sitting) on a weekly basis.
- For the STI sites, there was also a significant reduction in the percentage of participants using cocaine, marijuana, and alcohol.

As one might imagine, the main target for the OMT sites was a reduction in the use of heroin or other opiates. This may explain why these sites did not see significant results in the levels of use for marijuana and alcohol. Similarly, very few participants in the ODF and STI modes of treatment were heroin users at the time of intake; with a very small percentage to start out with, there was not much room for improvement in the outcome data. The LTR sites may have, more so than the other sites, been more encouraging of abstinence from *all* drugs, while the others may have targeted the participant's drug of choice, or drug of addiction. While heroin was the most frequently reported drug of abuse at admission for the OMT sites, cocaine was the most frequently-reported drug of abuse for the LTR, ODF, and STI sites.

Five years following the initial study; participants were reinterviewed regarding their past-year substance use habits; the same guidelines of hazardous use were used in this follow-up as were used for the 1-year follow-up measures (Hubbard et al., 2003). The following significant changes between the 1-year and 5-year marks were reported by Hubbard et al. (2003):

- For OMT sites, a significantly larger percentage of participants had returned to at least weekly use of heroin. However, there had also been a significant reduction in weekly problem alcohol use between the two follow-up points.
- For LTR sites, a significantly larger percentage of participants had returned to at least weekly use of heroin and cocaine.
- For ODF sites, a significantly larger percentage of participants had returned to weekly marijuana use.
- There were no significant differences between the 1 and 5 year mark for any substances in the STI mode of treatment.

These figures suggest that, at least for some substances at some types of treatment locations, the gains initially made in treatment may not last throughout longer periods of time. As well, throughout the DATOS study, a fairly liberal definition of problematic substance use is used. As opposed to some studies, which use abstinence as the hallmark of recovery, and consider any use of a problematic substance as an indicator of relapse, this study considers any use less than once per week to be nonproblematic.

The follow-up rates of use and relapse from these three studies indicate that, while initial gains are often made with regards to substance use following a course of therapy, these gains are often not maintained in the long run. Furthermore, additional reviews of rates of relapse have reported statistics much higher than those found in these studies. In a review of previously published work, Dawson, Goldstein, and Grant (2007) reported that between 40% and 60% of individuals will relapse within the first few months after leaving treatment, and as high as 70% to 80% will relapse by the end of year after leaving

treatment. In a review published by McKay and colleagues (2006), estimates show that, among the clinical population, between 25% and 50% of individuals move back and forth between periods of abstinence and heavy drinking or drug use. Though these reviews do not have the advantage of unified definitions of relapse and remission, they do indicate that, despite treatment, a large proportion of individuals diagnosed with SUDs return to use even after receiving treatment and obtaining some level of symptom remission.

Support Group Effects on Substance Use Outcomes

This section will review the effects that participation in self-help groups has on individuals' outcomes regarding use and dependence. It will start by reviewing the three studies outlined in the previous section, and examining the impact that participation in these groups made on remission at their follow-up data points. This section will then review other projects that particularly targeted the study of self-help group attendance to determine whether these groups made a significant impact on participants' levels of use and symptoms of dependence.

Participants in the Project MATCH study were interviewed regarding their participation in Alcoholics Anonymous both during and after treatment. While a higher percentage of participants attended meetings while in treatment, approximately 42% of participants overall attended meetings in the year after the treatment period ended (Tonigan, Connors, & Miller, 2003). The aftercare arm produced a significantly higher number of study participants that attended AA meetings than the outpatient arm; this is attributed to those in the aftercare arm having a greater problem and drinking severity

than those in the outpatient arm, as previous research has stated that these factors being predictors of involvement in Alcoholics Anonymous (Tonigan et al., 2003). As well, a significantly higher percentage of participants in the Twelve-Step Facilitation model attended AA meetings than those in the Cognitive-Behavioral and Motivational Enhancement treatment models (Tonigan et al., 2003).

In a follow-up analysis, the two outcome measures used to test the matching hypotheses, Percentage of Days Abstinent (PDA) and Drinks per Drinking Day (DDD), were tested for correlations with the number of meetings attended at each of the follow-up points during the first year. Participants were interviewed every three months for the year following treatment. At each of these follow-up points, a positive correlation was found between PDA and the number of AA meetings attended (Tonigan et al., 2003). The more meetings a participant attended, the larger the percentage of days that that participant did not drink. This correlation was found in both the outpatient and aftercare arms, and in all three models of treatment (for the outpatient arm, $r = .22$ at 3 months, $r = .23$ at 6 months, and $r = .19$ for months 10-12; for the aftercare arm, $r = .20$ at 3 months, $r = .28$ at 6 months, and $r = .26$ for months 13-15) (Tonigan et al., 2003). The authors did not report numerical values for correlations between DDD and meeting attendance. However, it is reported that there was a negative correlation between the number of meetings attended and this outcome measure. In other words, the more meetings an individual attended, the fewer drinks that she would consume on a drinking day. This was also found across arms and across treatment types, with one noted exception. For those participants in CBT treatment in the outpatient arm, for the first three months following treatment, there was a significant *positive* correlation between DDD and the

number of meetings attended – the more meetings one attended, the greater the number of drinks consumed on a drinking day. However, in the subsequent three month periods, the positive correlation disappeared, and a negative correlation in line with the other modes of treatment emerged. In addition to DDD and PDA, the Project MATCH researchers also found that the number of meetings attended was also predictive of the likelihood of *total* abstinence for the year following treatment (for the aftercare arm, $p < .0001$ during treatment, and $p < .001$ at all follow-up points; for the outpatient arm, $p < .01$ during treatment, and $p < .001$ at all follow-up points).

Two notes of particular interest to clinicians were found in examination of the characteristics of participants with regard to AA attendance. First, very few participants initiated AA attendance *after* completing treatment. Almost all those who attended meetings after treatment also attended meetings while in treatment (Tonigan et al., 2003). As well, continued participation in AA following treatment was more likely for those participants who attended two or more meetings per week while in treatment.

One of the main subjects of interest in the follow-up analyses in the CHCE study was that of the relationship between participation in Alcoholics Anonymous and drinking outcomes. At the one-year follow-up, Moos & Moos (2004) were able to successfully re-interview 473 of the original 628 participants. Two hundred seventy-two (57.5%) of the follow-up participants attended at least some amount of AA meetings during the first year following treatment. A regression analysis of participation in Alcoholics Anonymous as a predictor of drinking outcomes showed that participants who attended AA meetings for 17 or more weeks in the first year following treatment had significantly better outcomes

for the three drinking variables (abstinence, alcohol-related problems, and symptoms of dependence), than those participants who attended less than 17 weeks. In fact, those participants who attended AA meetings for 1 to 16 weeks did not show better outcomes than those who did not attend meetings at all. Though there did not appear to be a relationship between frequency of meeting attendance and 1-year outcomes regarding alcohol-related problems or symptoms of dependence, those participants who attended 2 or more meetings per week were more likely to be abstinent than those individuals who did not attend meetings at all.

Participation in AA during the first year following treatment appeared to have an effect on long-term drinking outcomes in the CHCE study, regardless of whether participants continued attending meetings beyond the first year. Four hundred fifty-eight participants were successfully re-interviewed 8 years following treatment, and 405 participants were successfully re-interviewed 16 years following treatment. (Moos & Moos, 2004, 2006a). The duration in weeks of meeting attendance during the first year was significantly related to all three drinking outcomes at the 8-year mark; as well, frequency of participation was related to a higher likelihood of abstinence 8 years following treatment (Moos & Moos, 2004). Contrary to the 17-week threshold necessary for improved outcomes at the conclusion of year one, participants at the 16-year mark who had attended AA meetings for 9 weeks or more in the first year showed significantly better outcomes at the 16-year mark. It is possible that, after 9 weeks, some participants may have had a “good start” on the road to recovery, but experienced a relapse by the end of the year; however these individuals may have been able to recommit themselves to recovery from alcoholism, and successfully done so in subsequent years. In addition to

participation in AA in the first year, duration in participation beyond the first year following treatment was generally associated with better outcomes on all three alcohol-related variables at both the 8-year and the 16-year follow-ups (Moos & Moos, 2004, 2006a).

Several secondary analyses were conducted by the DATOS research group (Etheridge et al., 1999) to examine variables related to self-help group attendance. These analyses targeted the use of cocaine and alcohol at the one-year post-treatment mark; the OMT modality was excluded from this analysis, as heroin dependence was the primary target treated in this modality. One such analysis compared a created variable of “counseling-self help hours” completed in treatment to substance use outcomes; the variable totaled the number of hours of therapy received and the number of self-help groups attend *while in treatment* and compared this “dose” of treatment to problematic substance use (ie, weekly cocaine use or weekly consumption of 5 or more drinks in one day) at the one-year follow-up. For all three modalities analyzed (STI, ODF, and LTR), the number of hours received in treatment did not predict post-treatment substance use. This supports the CHCE and Project MATCH data suggesting that the number of sessions does not appreciably affect outcome. This study also examined the number of self-help group meetings attended in the follow-up year as they relate to outcomes for cocaine and alcohol. In this analysis, it was found that attendance at 2 or more meetings per week significantly reduced the likelihood of relapse to cocaine in the STI and LTR modalities of treatment (though not for the ODF modality); there was no difference in likelihood of relapse between those who attended less than two meetings per week and

those who did not attend at all. Particularly striking were the results from the LTR modality, in which participants who attended two or more meetings per week had 1/8 the odds of relapse as compared to those attending less than two meetings per week. However, the number of self-help groups attended did not predict problematic alcohol use. The lack of confirmatory data in this analysis may be due to the fact that the main focus of the DATOS study was drug use, and that the majority of DATOS participants were seeking help for addiction to cocaine; those who only exhibited symptoms of dependence to alcohol were excluded from the study.

A number of additional studies have specifically targeted participation in AA meetings in particular, and self-help or “12-step” groups in general as they related to alcohol and drug use outcomes. A selected number of these studies will be reviewed below. These reviews will include a brief description of the studies, the percentage of participants who chose to participate in self-help groups, how outcomes were measured, and relationships found between substance use outcomes and participation in self-help groups. In general, these studies recruited a smaller number of participants from a more restricted geographical area and from a more restricted number of treatment programs than the multisite studies reviewed above.

Gossop and colleagues (2003) describe a study of participants drawn from patients at a short-term inpatient hospital unit for the treatment of alcoholism. Patients receiving treatment in this unit were encouraged to attend at least one AA meeting per week and meetings were held on the hospital premises; however, patients were not

required to attend meetings. The purpose of this study was to measure whether attendance at Alcoholics Anonymous meetings significantly affected drinking outcomes 6 months following discharge (Gossop et al., 2003).

One hundred fifty participants originally took part in this study; 120 participants (80%) were successfully interviewed at the 6 month follow-up (Gossop et al., 2003). Interestingly, the only significantly differing variable between the 120 follow-up participants and 30 participants who were not successfully reinterviewed was that of lifetime AA meeting attendance; those who dropped out of the study had attended significantly fewer meetings. Participants were interviewed shortly after intake; measures related to alcohol use included a survey of alcohol-related problems, a calculation of the percentage of days that the participant consumed alcohol, and a questionnaire on symptoms of dependence. The 6-month follow-up interview was identical to that at intake; both surveys asked clients to describe behaviors in the month prior to the interview.

At follow-up, participants were simply divided between “attenders” and “non-attenders” of AA meetings; during the follow-up period, 40% of participants attended meetings. Of this number, only 35% attended on a weekly or more frequent basis. With the initial analysis of these two groups, those attending AA reported less frequent drinking than those who did not attend meetings; however, this difference did not reach the level of significance of .05 set by the researchers. The group of follow-up participants were then divided again between “nonattenders,” “infrequent attenders” (those who attended meetings less than once per week) and “frequent attenders,” (those who attended one meeting per week or more). Though drinking quantity on drinking

days and symptoms of dependence were not significantly different between infrequent and frequent attenders, frequency of drinking was significantly lower for those attending at least one meeting per week. As well, difference in symptoms of dependence, though not significant, approached significance with a p-value of .07.

Watson and colleagues (1997) studied the relationship between varying levels of attendance at AA meetings during the month following inpatient treatment and alcohol consumption for 48 weeks following treatment. One hundred fifty male participants were drawn from a 3-week inpatient program operated by the Department of Veterans Affairs. Information regarding both drinking habits and AA attendance was reported to the researchers primarily through relatives of the study participants who were identified by the participants at the beginning of the study. Participants were divided into four groups based on their attendance at AA meetings during the month following treatment; nonattenders (0 meetings); occasional attenders (1-4 meetings), moderate attenders (4-8 meetings) and frequent attenders (9 or more meetings). The percentage of participants in each of these four groups were as follows: nonattenders, 25.3%; occasional, 32%; moderate, 24.7%; and frequent, 18%.

Results from this study indicated that nonattenders drank significantly more in the 48 weeks following treatment than occasional or moderate attenders (Watson et al., 1997). Those who were frequent participants fell between nonattenders and occasional attenders with regards to alcohol consumption, and were not significantly different from any of the other three groups with regards to drinking outcomes. When dichotomizing the participants into two groups, attenders and nonattenders, attenders had a significantly

lower level of consumption; the researchers attribute this result to higher levels of abstinence among occasional and moderate participants.

The results of this study lend support to the thought that “some AA is better than no AA;” however, it does not lend support to the thought of, “the more AA the better.” In fact, those attending the most number of meetings had the poorest outcomes among the three groups of meeting attendees. The authors acknowledge that this study does not take baseline drinking levels into account, and that outcomes are simply total levels of consumption rather than reduction in consumption between baseline and follow-up points (Watson et al., 1997). It may be that those participants who fell into the “frequent” category had higher baseline levels of alcohol consumption, or may have had a more severe level of dependence.

With the exception of DATOS, all of the studies reviewed thus far were primarily concerned with treatment of alcoholism and attendance at Alcoholics Anonymous following treatment; these did not focus other drugs and how self-help groups affect one’s continued use, abuse, or dependence to these drugs. In Fiorentine’s (1999) study, the focus of research was on drug treatment and how participation in 12-step groups after treatment affects outcome. For the purpose of this study, abstinence was the hallmark used for substance use outcomes. This research was part of a larger project in the Los Angeles, California area entitled the Target Cities Treatment Enhancement Project, aimed at improving the accessibility and effectiveness of drug treatment. This analysis encompassed participants from 26 outpatient programs; 356 participants completed the initial interview in the study 8 weeks after initiating treatment. Follow-ups were

conducted 6 months after the initial interview, and again 24 months following the initial interview; at these points, 330 and 262 participants, respectively, were successfully interviewed. The follow-up analysis was conducted using the 262 participants who completed all three interviews. Crack cocaine and marijuana were the most widely used drugs in the year prior to treatment, though a significant number of participants also used powder cocaine, methamphetamine, PCP, heroin, and barbiturates. Approximately 50% of participants used multiple substances.

Of this sample, 49% of participants attended at least one 12-step meeting during the 6 months prior to the 24-month followup; 39% of the sample attended at least one meeting per week during this period (Fiorentine, 1999). Those individuals who attended any amount of meetings were significantly more likely to be abstinent from drugs than those individuals who did not attend meetings; 27% of those attending meetings used illicit drugs during the 6 months prior to follow-up, as compared to 44% of those who did not attend any meetings. However, 80% of participants who attend *any* meetings attended at least once per week. When comparing rates of abstinence between these three groups, those attending less than once per week were closer to those who did not attend at all than those who attended at least once per week; 22% of weekly-or-more attendees used illicit drugs, as compared to 44% of the less-than weekly attendees.

Gossop and colleagues (Gossop, Stewart, and Marsden, 2007) conducted an examination of attendance at Alcoholics Anonymous and Narcotics Anonymous meetings as they relate to use outcomes in a post-drug treatment population drawn from the National Treatment Outcome Research Study. This study drew participants from 23

inpatient and residential drug treatment facilities throughout England; 255 participants were initially included in the study. Participants were required to have been diagnosed with a drug dependence disorder; though participants were not eliminated for a co-occurring alcohol dependence disorder, they were not eligible if their only dependence diagnosis was alcohol-related. Interviews were conducted at intake, 2 years following treatment, and 4-5 years following treatment; analysis was conducted for 145 participants who completed all three of these interviews. As in Fiorentine's study described above, abstinence was used as the criterion for use outcomes. Drugs of abuse prior to intake among participants in the study included heroin (77%), non-prescription methadone (35%), cocaine (51%), and amphetamines (35%) (Gossop et al., 2007).

Follow-up interviews gauged participants' drug use and attendance at 12-step meetings for the 90 day period preceding each interview; as well, participants were interviewed regarding alcohol use, though not all participants had been diagnosed with an alcohol use disorder (Gossop et al., 2007). At the 1-year mark, 25% of participants attended any number of any kind of self-help group during the preceding 90 days; at both the 2 year and 4-5 year marks, 20% of participants attended meetings. At the 1-year mark, those individuals who attended NA or AA were significantly more likely to be abstinent from opiates, stimulants *and* alcohol than those who did not attend NA or AA. At the 2 and 4-5 year mark, those who had participated in NA or AA were significantly more likely to be abstinent from opiates and alcohol; however, those attending self-help groups were not more likely to be abstinent from stimulants.

This study also examined frequency of attendance at NA and AA meetings as they related to rates of abstinence. Results from this analysis were similar to the findings

of Fiorentine's 1999 study. Those participants who attended meetings at least once per week at any of the follow-up points were more likely to be abstinent at the 4-5 year follow-up from opiates and alcohol than those who attended meetings less than once per week (Gossop et al., 2007). Those who attended support groups at least once per week had higher rates of stimulant abstinence at the 4-5 year mark as well, but the difference was not over the 5% level of significance set by the research team. As seen in previous studies, those who attended meetings less than once per week were no more likely to be abstinent than those who did not attend meetings at all.

The researchers do not give explanation for why stimulant abstinence rates for support group attendees were significantly lower at the one year mark, but not at the subsequent follow-up marks. Though it is not certain, one possible explanation may be that former stimulant users stopped attending meetings after maintaining a period of abstinence, and that they remained abstinent even after meeting attendance was concluded. Those individuals who continued to attend NA or AA after the one-year mark may have been people who continued to struggle with stimulant dependence.

Studies that do not support the benefits of SH group attendance on drinking outcomes

In a study of the relationship between AA and drinking outcomes, Montgomery and colleagues (Montgomery, Miller, & Tonigan, 1995) recruited 66 participants from the Turquoise Lodge, a 28-day inpatient program in Albuquerque, New Mexico, which places heavy emphasis on the principles of Alcoholics Anonymous. 54 participants were successfully interviewed at a follow-up point, approximately 7 months following treatment. Drinking outcomes in this study were measured by the level of consumption

of alcohol. Attendance was dichotomized between attenders and non-attenders of meetings during the follow-up. As well, involvement in Alcoholics Anonymous was gauged through a new measure, the General AA Tools of Recovery [GAATOR]; this measure contains questions designed to reflect working the 12 steps of AA. Scores on this measure were also compared to the level of consumption of alcohol during the follow-up period.

Contrary to the previously reviewed studies, outcomes of the analyses conducted in this study showed no difference in reduction of drinking between attenders and nonattenders of AA. However, a positive relationship was found between AA involvement (as scored by the GAATOR) and reduction in drinking. No data was reported regarding the percentage of the follow-up sample that attended AA meetings.

Several aspects of this study that differ from the others reviewed might explain the lack of relationship between meeting attendance and drinking outcomes. In comparison, this study contained a much smaller sample size from a much more constricted geographical location; as well, participants were only drawn from one treatment facility. Participants in this study appear to have an extremely high level of alcohol consumption; the average consumption at intake for study participants was 26 standard drinks per day. Finally, while other studies examined the number of meetings attended, this study divided this group into “attenders” and “nonattenders;” this may have skewed the data in that an individual who only attended 1 or 2 meetings in the 7 month period following treatment would be considered a meeting attender.

Within a pharmaceutical study, Mueller and colleagues (Mueller, Petitjean, Boening, & Wiesbeck, 2007) examined drinking outcomes as they relate to self-help group attendance after a period of alcohol detoxification. Participants were drawn from 13 alcohol treatment centers in Germany. The larger study tested the effectiveness of a new medication in the aid of recovery from alcoholism; in this smaller study, 78 members of the placebo group were interviewed regarding their drinking habits and self-help group attendance. Participants were interviewed at 1, 3, 6, and 12 months following detoxification; at the end of the twelve-month period, 46 of the original 78 participants remained. In this study the focus of drinking outcomes was on “relapse,” defined by the author as any drinking (or anything less than total abstinence). Results were reported as “days until first relapse.” Approximately 64% of the sample as a whole made up the group of self-help group attendees; participants were reported as attending self-help groups once per week, though how this number was derived is not described in study report.

Mueller and colleagues (2007) did not find a difference between those who attended self-help groups and those who did not with regards to abstinence throughout the study; there was not a significantly longer period of time before relapse for those who attended self-help groups. However, several differences between this study and those with more positive outcomes may have influenced these results. The participants’ expectations in this study were that they were receiving a medication to aid in recovery, when in fact they were receiving a placebo. Though the participants who attended self-help groups certainly would expect that attendance would be of added benefit, placing faith in medication might in some way have had an influence on abstinence. As well,

most other studies reviewed took place in the United States, while this study took place in Germany; there may be differences in culture, beliefs about drinking, and in the self-help groups themselves that may have influenced results. Finally, a number of participants were excluded from the study in attempt to obtain a “pure” sample of those whose only clinically significant problem was that of alcohol dependence. To this end, those with clinically significant levels of anxiety and depression, as well as those who had severe physical, neurological, and psychiatric disorders were excluded from the study. Though this would in fact eliminate the influence of these variables, it would as well make this sample less generalizable to the population as a whole, where co-occurring disorders are the rule rather than the exception.

Summary

The general trend in this review of outcomes as they relate to support group attendance supports the claim that attendance at these meetings helps to improve use outcomes, whether the outcomes are measured through reduction in consumption of the substance of study or through rates of total abstinence. Further, this claim appears to find greater support in those studies that included a larger sample size from more diverse geographical locations and more diverse programs. Those studies that did not show significant improvements regarding use among meeting attenders were those studies that had smaller sample sizes (under 100 participants) and in the case of the Montgomery study, drew participants from only one treatment program. In short, those studies that were more generalizable to the substance treatment population as a whole were more likely to produce support for self-help group efficacy than those studies with a more constricted population.

Looking at the overall rates of attendance at support groups following treatment, it appears that, on average, approximately half of individuals who undergo treatment for drugs or alcohol attend support groups following treatment. Given the greater possibility of remission for those individuals who attend support groups following treatment as compared to those who do not attend, it would be of great interest to clinicians to examine the differences between these two groups. In the next section, the author will review the literature regarding what is already known regarding individuals who choose to join support groups. The majority of published material on this topic focuses on Alcoholics Anonymous; this is not surprising given that this organization is the most widespread, and most highly attended mutual aid group pertaining to substance dependence. This review will now turn to the previous work regarding the relationships between the variables selected for inclusion in the current study.

Previously published work regarding variables in the current research

The predictive value of variables used in the current study has never before been considered in totality with the same sample of subjects. In fact, there are a limited number of published studies that examine these variables in relation to one another at all. Those few previously published works that have examined the relationship between two or more variables of interest to the current research will be reviewed in the following sections. Each pair of variables will be considered individually.

Relationship between depression and support group attendance

Using an original sample of participants from 15 Veteran's Affairs hospitals, Kelly, McKellar, and Moos (2003) sought to compare the relationship between major depression and support group participation. To this end, 3,698 male participants

diagnosed with SUD's were recruited. Eliminated from this study were participants who were diagnosed with a psychiatric disorder other than Major Depressive Disorder and those who were unable to be followed throughout the 2 year period. Assessments were conducted at discharge and at the one- and two-year marks following discharge. At discharge from formal treatment, 110 of these participants were assessed as having Major Depressive Disorder (MDD) based on the International Classification of Diseases – 9th revision (ICD-9-CM) and measured through the Brief Symptom Inventory (BSI). This group of participants was compared to those who were only diagnosed with SUD's.

Using chi-squared and analysis of variance tests, the SUD-only and SUD-MDD groups were compared on a number of variables related to support group participation (Kelly et al., 2003). Measures were taken at both the 1-year and 2-year follow-ups regarding frequency of 12-step attendance, incorporating steps into one's daily life, frequency of reading 12-step literature, having a sponsor, frequency of talking to a sponsor, number of friends from 12-step groups, and frequency of contact with friends from 12-step groups. At the one-year follow-up, the SUD-MDD group was found to be less likely to have a sponsor ($p = .04$), to have a smaller number of friends from 12-step groups ($p = .01$) and to less frequently read 12-step literature ($p = .05$). However, there was not a significant difference between groups with regards to actual meeting attendance. These outcomes suggest that, while there may not be a great difference in actual numbers of meetings attended, those with MDD may be less involved or invested in groups than those who are only diagnosed with an SUD.

Despite the differences found at the 1-year mark, at the 2-year mark, there were no significant differences found between the SUD-MDD group and the SUD-only group

on any of the outcome measures related to support group involvement. This suggests that those who have a comorbid diagnosis of Major Depressive Disorder may have a longer “adjustment period” to support groups than do those with Substance Use disorders alone (Kelly et al., 2003). Interestingly, the sample was also assessed regarding substance use frequency at each follow-up point, and no significant differences were found. As well, those in the MDD group attended 2 ½ times more mental health appointments than those in the SUD-only group.

Taken in totality, these figures suggest that perhaps those with comorbid depression rely more heavily on formal treatment than support group participation for support regarding problems of substance use. Though there is no evidence in the results from this study that those with depression would be less likely to attend support groups than those without depression, the lower level of activity in support groups at the 1-year level suggests that there *may be* a lower level of participation in meetings or programs among those who suffer from depression. This suggestion will be further tested through the current research.

Relationship between anxiety and support group attendance

Virtually no published research exists regarding the relationship between anxiety and support group attendance. This is somewhat surprising, given the notion that a person suffering from such disorders as social anxiety or agoraphobia may be uncomfortable attending support groups as a means of recovery from SUDs. One study loosely related to anxiety was conducted by Hurlburt, Gade, and Fuqua (1984). This study examined personality differences between members of AA and non-members of AA by administering the Eysenck Personality Questionnaire (EPQ) to 85 members of

Alcoholics Anonymous and 85 individuals who had recently completed formal treatment for alcoholism, but were not AA members. Non-AA members scored significantly higher on the dimensions of “toughmindedness” ($p < .01$), “emotionality,” ($p < .05$), and “introversion,” ($p < .05$). Though the EPQ does not have a scale directly related to anxiety, the combined higher scores of introversion and emotionality for non-AA members may be suggestive that a more anxious person would be less likely to attend support group meetings. However, the authors are careful to state that the EPQ is meant as a measure of normal ranges of functioning, and not an indicator of psychopathology. As well, the differences in the scores may be explained as a *result* of AA attendance for the AA-member group, rather than an indicator of pretreatment or pre-participation characteristics. In other words, exposure to and participation in AA may lead to an individual being less introverted or less “emotional” (as measured by the EPQ) – this may be an effect of participation in the support group rather than an indicator of who might be more or less likely to attend.

Clearly, the relationship between anxiety and support group attendance (if such a relationship exists) has not yet been thoroughly examined. If a relationship between these two variables exists (or even if one does not exist), it could be of interest to clinicians with regards to treatment planning for individuals with SUDs. If higher levels of anxious symptoms indeed produce a barrier to support group attendance, clinicians may choose to target these symptoms as part of treatment. If higher levels of anxious symptoms predict higher levels of support group attendance, this may be an indicator to clinicians that support groups may be a good method of intervention for these individuals. Whatever the outcome, the examination of the relationship between these two variables

will increase clinicians' knowledge of the process of dependency and recovery. It is the author's hope that, through the current research, this examination can begin, and the construct of anxiety can be studied more directly than in the above-mentioned study.

Relationship between motivation to change/treatment readiness and support group attendance

Using the original sample and same methods in the 2003 study by Kelley and colleagues described above, Kelly and Moos (2003) conducted research regarding predictors of dropout from 12-step groups. Of the original sample of 3,698 participants, data for this analysis consisted of responses from 2,518 individuals who were able to be tracked through one year following discharge from treatment, and who had attended at least one 12-step meeting either during treatment or in the 90 days prior to treatment entry. These participants were divided into two groups; those who had attended at least one 12-step meeting in the 90 days prior to the 1-year follow up were considered "members;" those who had not attended at least one 12-step meeting during this time period were considered "dropouts." It is noted that the odds of use at the one-year mark for dropouts was three times higher than for members at the one-year mark, and that the odds of not being in remission (no drug use, no problems related to use, and consumption of no more than 3 oz of alcohol on any day) were twice as high among dropouts.

These two groups were administered an inventory at baseline, discharge, and one year after discharge covering a wide variety of measures (Kelly & Moos, 2003). Of particular interest to the current research is the four-item "Determination" subscale from the Stages of Change Readiness and Treatment Eagerness Scale (SOCRATES), developed from Prochaska and DiClemente's transtheoretical model. It is from this

measure that Kelly and Moos derived a measure of motivation for use in this study; measures from the intake data point were used as predictors. When conducting separate logistic regression analyses, the motivation variable (along with six other variables) was considered predictive of whether an individual would be a member or dropout; those individuals who scored lower on the scale of motivation were more likely to drop out of 12 step groups ($p < .0001$) (Kelly & Moos, 2003). When the seven significant variables were considered simultaneously in a secondary regression analysis, motivation was among three variables found to independently predict dropout (the other two being greater self-help involvement prior to treatment and more frequent attendance at religious services).

Perhaps most similar to the current research is a secondary analysis of data from Project MATCH conducted by Richard Cloud (2003). This study employed the subset of participants who had received twelve-step facilitation treatment (TSF) to test a model of affiliation with Alcoholics Anonymous post-treatment. Participants were dichotomized between two groups based on results from the one-year post-treatment follow-up; one group consisted of participants who had attended meetings weekly or more often, while the other consisted of participants who attended meetings less than weekly or not at all.

Several variables related to motivation were tested for their degree of prediction as to which of these two groups a participant was likely to fall. A composite *motivation* score was procured through the use of the University of Rhode Island Change Assessment's Motivation Scale and two subscales of SOCRATES, "recognition of the problem" and "ambivalence about change," all of which were administered at intake (Cloud, 2003). As well, measures of action orientation were taken using a count of the

number of prior attempts to stop drinking (taken from the Alcohol Use Inventory [AUI]), a subscale of SOCRATES measuring the taking of steps to initiate change, and the proportion of total Project MATCH treatment sessions that the individual attended.

Binary logistic regression found that, of the variables related to motivation and action orientation, two variables from the category of action orientation were predictive of post-treatment AA attendance. A greater number of “prior attempts to deal with drinking” from the AUI was predictive of greater post-treatment AA attendance ($p < .01$). As well, a higher score on the scale of “taking steps to deal with drinking,” taken from SOCRATES, was predictive of greater post-treatment AA attendance ($p = .01$). None of the variables considered to be strictly “motivational” rather than indicative of “action orientation” were found to be significant. The author suggests that the action orientation items may be more closely related to AA culture, and that individuals who score high on these items may be a better social fit for AA (Cloud, 2003).

Though somewhat equivocal and methodically different than the current research, these two studies lend some support that an individual’s motivation for change may be related to one’s attendance at support groups following treatment. It is on the basis of these studies that the current research hypothesizes that greater motivation will be predictive of greater support group attendance.

Relationship between depressive/anxious symptoms and motivation to change

Two known studies describe the relationships between depressive and anxious symptoms and one’s motivation to change. One study, conducted by Blume, Schmalting and Marlatt (2001) considered depression alone, while another, conducted by Smith and Tran (2007) considered the effects of both depression and anxiety on one’s level of

motivation. Blume, Schmalings, and Marlatt (2001) sought to describe the relationship between depression and motivation for behavior change among individuals diagnosed with alcohol use disorders. The authors proposed that, according to the transtheoretical model, higher levels of depression would increase the “costs” side of the costs-benefits ratio of continuing drinking, thus creating greater motivation to change the behavior. However, the authors also stated that a high negative association between depression and self-efficacy may serve to limit depressed individuals in their abilities to make behavioral changes. The authors hypothesized that higher levels of depression would result in lower precontemplation scores and higher contemplation scores among a sample of participants diagnosed with alcohol use disorders. Also hypothesized was that participants with higher depression scores would score lower in measures of action stage. Participants were administered the Beck Depression Inventory (BDI) to measure depression, and the Brief Readiness to Change Questionnaire (RTC; Rollnick, Heather, Gold, & Hall, 1992) to measure the individual’s stage of change. The latter measure, based on the transtheoretical model, produces three scores measuring the degree to which the individual identifies as being in the precontemplation, contemplation, and action stages.

Seventy-one participants for this study were recruited through flyers and newspaper advertisements. The inclusion criterion for the study was that participants must meet the criteria for alcohol abuse or alcohol dependence as determined through the Structured Clinical Interview for the DSM-IV. Individuals, however, were excluded if also diagnosed with an SUD other than alcohol, or if they were diagnosed with a psychotic disorder. Of important note is that the majority of individuals participating in this study did not exhibit clinically significant levels of depression (Blume, Schmalings,

and Marlatt, 2001). The results of the BDI, then, must be interpreted as a level of depressive symptoms rather than an actual diagnosis of depression.

Pearson's product-moment correlations were calculated between the participants' BDI scores and each of the scales on the RTC (Blume et al., 2001). As hypothesized, a significant negative correlation was found between the precontemplation scores and BDI ($r[73] = -.43$; $p < .001$), and a significant positive correlation was found between the BDI and contemplation scores ($r[73] = .29$; $p < .02$). However, a significant correlation in the opposite of the hypothesized direction was found between the BDI and action scores ($r[73] = .35$; $p < .01$). These scores indicate that individuals with less depressive symptoms were less likely to contemplate change, and less likely to take steps to change drinking behavior, while individuals with more depressive symptoms were more likely to contemplate change, and more likely to engage in activities to change drinking behavior. These results lend support to the notion that symptoms of depression serve to motivate individuals to change their behavior. In turn, this added motivation may serve to encourage individuals to attend support groups following treatment.

Smith and Tran (2007) conducted a study examining the relationship of symptoms of both depression and anxiety with change readiness among college students engaging in hazardous levels of alcohol consumption. Participants were drawn from students enrolled in an introductory psychology class. Potential subjects were administered the Alcohol Use Disorders Identification Test (AUDIT); those scoring "8" or higher on this 10-point scale were selected for participation. Two-hundred thirty-three total participants were examined in the subsequent analyses. The methods and measures employed in this study were very similar to those employed in the study by Blume and colleagues described

above. The authors hypothesized that a greater number of symptoms of depression and anxiety would predict greater levels of readiness to change.

As in the previously described study, the Beck Depression Inventory was used to measure depression, and the Readiness To Change Questionnaire was used to assess motivation (Smith & Tran, 2007). In addition to these two measures, the State-Trait Anxiety Inventory, Trait Form (STAI-T) was used to measure symptoms of anxiety. The researchers conducted three separate regression analyses; one to test depression scores' ability to predict change readiness scores, one to test anxiety scores' ability to predict change readiness scores, and one in which depression and anxiety scores were entered in the same step.

Results from the first of these analyses found that depression scores significantly predicted scores on the readiness to change measure in the hypothesized direction ($p = .04$); those found to have more symptoms of depression were more motivated to change their behavior (Smith & Tran, 2007). In addition, the second analysis found that anxiety scores significantly predicted scores on the readiness to change measure in the hypothesized direction ($p = .004$); those who had greater symptoms of anxiety were more motivated to change. In the third regression, in which depression and anxiety were entered in the same step, the combination of these two variables was significant overall ($p = .015$); however, the main effect of depression was not significant ($p = .64$), while the main effect of anxiety was considered marginally significant ($p = .06$). Depression and anxiety in this study were moderately to highly correlated with one another ($r = .68$; $p = .0001$). The authors indicate that these results may suggest that anxiety is a better predictor of motivation to change than is depression, as the majority of the predictive

capacity of the depression variable was absorbed by the anxiety variable when the two were considered together. The authors suggest that, “depression is characterized by anhedonic aspects which may compromise an individual’s motivation to change” (p. 2284).

The previous two studies indicate that both depression and anxiety may have a relationship with an individual’s readiness to change. They suggest that greater levels of depression and anxiety may be correlated with, or predictive of, a greater likelihood that a person is prepared to make changes in his life, particularly regarding substance dependence. This resonates with the transtheoretical notion that greater distress will create a greater desire to change; the “costs” side of the costs/benefits equation of continued use is amplified by psychological distress, and outweighs the benefits that one derives from use. Both of the two previous studies examined individuals engaging in hazardous use of alcohol; the Smith and Tran (2007) study examined only college students. The current research will test if the results found in these studies hold true among a drug using population, as well as a wider age range of participants. As well, the scales used in the studies reviewed in this chapter measure one’s readiness to change in general; the measure used in the DATOS study targets one’s level of motivation specifically to engage in substance abuse treatment.

Taken in totality, the previous research conducted regarding the variables of interest suggests certain directions of relationships between variables. These relationships can be viewed as an overall process by which one may or may not be more

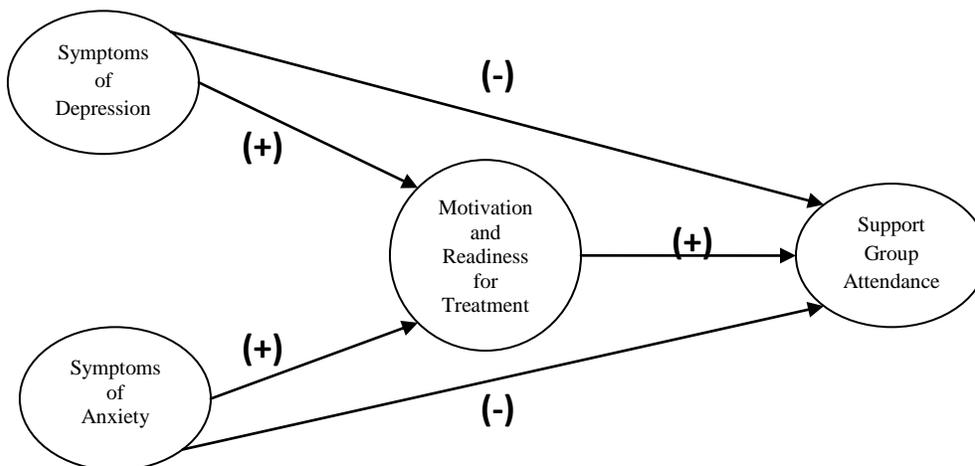
likely to attend substance use-related support groups following treatment. The research suggests the following relationships:

- People with a higher level of depressive symptoms are less likely to attend support groups.
- People with a higher level of anxious symptoms are less likely to attend support groups.
- People with a higher level of motivation are more likely to attend support groups.
- People with a higher level of depressive symptoms are more likely to have higher levels of motivation.
- People with a higher level of anxious symptoms are more likely to have higher levels of motivation.

Represented pictorially, the following diagram (Figure 1) of relationships can be created from these statements:

Figure 1

Hypothesized path diagram



This diagram is somewhat contradictory. For example, it suggests that, through a direct relationship, *lower* levels of depressive symptoms are predictive of greater support group attendance. However, it also suggests that, through an indirect relationship mediated by motivation and readiness for treatment, *higher* levels of depressive symptoms are predictive of greater support group attendance. Therefore, the diagram would suggest that both higher *and* lower levels of depressive symptoms contribute to a greater likelihood of meeting attendance. Granted, the individual components of this diagram are composed of the results from different studies with different populations. As well, some components of this model are drawn from a small number of published studies, some of which are only loosely related to the variables of interest (i.e., the relationship between anxiety and support group attendance).

Given the limited amount of research related to the relationships between these variables, further examination appears to be warranted. The fact that differing studies, when considered as a whole, suggest differing directions of prediction also gives rise to the need for further investigation of these variables. The current research will examine these relationships within a single pool of participants (those from the DATOS study), rather than piecing together the results of a number of different studies. By using a single participant population, the author hopes to determine whether the individual relationships between variables hold true with the prior research; in addition, the author hopes to determine whether this overall model fits within a single participant population. The method by which these relationships will be tested is the subject of the following chapter.

CHAPTER III

METHODS

The data used for analysis in the current study is drawn from the Drug Abuse Treatment Outcome Study (DATOS), originally collected over a three year period (1991-1993) (Etheridge et al., 1997). A thorough review of the methods and treatment types used in the original DATOS study is available through articles published by Flynn and colleagues (1997) and Etheridge and colleagues (1997). The main target of interest of the original research team was the effectiveness of different types of treatment, and how individual differences of participants may affect different treatment types. Though data were collected regarding support group attendance following treatment, very little research was conducted examining characteristics of participants and post treatment meeting attendance. Those analyses involving support group attendance were limited to those that examined drug use outcomes (Etheridge et al., 1999). Rather than examining the effectiveness of treatment or the effectiveness of support groups, the current research will examine the likelihood that an individual will attend support groups based on their level of depressive symptoms, anxious symptoms, and motivation to change.

Participants

Participants in DATOS were recruited upon intake to one of 96 drug treatment centers in eleven cities throughout the United States (Flynn et al., 1997). Cities selected for the study included Chicago, Houston, Miami, Minneapolis, Newark, New Orleans, New York, Phoenix, Pittsburgh, Portland, and San Jose. Participants were drawn from

four different treatment modalities: short term inpatient treatment (STI), outpatient drug-free treatment (ODF), outpatient methadone treatment (OMT), and long term residential treatment (LTR). With the exception of participants in OMT treatment, whose primary substances of abuse were opiates, the majority of participants in the STI, LTR, and ODF sites were in treatment for dependence to cocaine. Initially, 10,100 participants were recruited for the study. To create the sample for the one-year follow-up, those participants who did not complete the intake process (primarily, those who were in treatment for less than one week) were eliminated from the study (Hubbard et al., 1997). As well, participants were eliminated who attended programs that admitted less than 20 clients during the period of the study; participants from 20 treatment centers were eliminated through this measure. With these eliminations, 4,229 participants remained eligible for the follow-up 12 months after treatment termination. Of these participants, 2,966 were successfully interviewed.

The researchers acknowledge that, in an effort to focus on individuals who received a substantial amount of treatment, those participants completing greater than three months of treatment (or greater than one month for the STI programs) were overrepresented in the follow-up sample (Hubbard et al., 1997). However, a significant difference in rates of weekly drug use for most drugs was found in the ODF and LTR between those individuals receiving 3 months or more of treatment and those individuals receiving less than three months of treatment. Participants in these modalities receiving three months or more of treatment had significantly lower rates of weekly drug use. Though a significant difference between these two groups was not found in the OMT program, participants who were still receiving treatment at the time of the follow-up were

significantly less likely to be weekly drug users than those who received less than 3 months of treatment (Hubbard et al., 1997). This information mirrors the results found in the DARP and TOPS studies that those participants receiving longer durations of treatment had better use outcomes. It is important to note that this information taken in totality suggests that the follow-up sample is likely skewed towards those participants who were willing to stay in treatment longer, and would likely have better outcomes regarding continued use.

The current research examines two questions regarding support group attendance; “During the past 12 months, have you attended this kind of 12-step or self-help group?” and “During the past year, how many times have you attended this group/any of these groups.” If a numerical response is given for the latter of these two questions, this number is used as the value for the dependent variable for this individual. If this question is left blank, the former question will be checked. If the response to this question is “No,” a value of “0” is entered for the number of groups attended. If the answer to this question is “yes,” or left blank, this participant is necessarily eliminated from the study, as the value for the dependent variable cannot be determined. As well, participants who did not fully complete the questionnaires pertaining to symptoms of depression, symptoms of anxiety, and motivation to change are also eliminated from the current study. Taking into account the participants who are eliminated due to missing data in scales of depression, anxiety, and motivation, as well as missing data among the questions pertaining to meeting attendance, the sample size for the current research is 1533 participants.

Comparison of DATOS Samples to Current Sample

The sample used in the current research was compared to the data in Intake 1 from the original DATOS study to determine differences in the domains of age, time in treatment, gender, race, primary drug problem, and treatment modality. The first two of these variables, which have continuous values, are presented in Table 1; this analysis was conducted as a t-test. For these variables, the standard deviation, range, skewness, and kurtosis for each sample are also presented; these figures were calculated using SPSS (version 17.0.02; SPSS, Inc., 2009). Those variables that are comprised of nominal data are presented in the form of percentages, also calculated using SPSS, and are presented in Table 2. Chi-square tests were conducted for the variables contained in Table 2 as a means of comparing the original and analytic samples; significant differences and their corresponding p-values are noted on this chart.

As is evident in Table 1, significant differences were found between samples for both of the variables upon which t-tests were performed. Participants in the current study were more likely to be older and to have spent more days in treatment than participants in the original DATOS intake. In looking at the percentages presented in Table 2, participants in the current sample are more likely to be female and Caucasian than in the original DATOS sample. There are also a greater percentage of participants reporting heroin as their primary drug problem in the current sample than in the DATOS intake sample, and (as one might expect given the difference in primary drug problem) a greater percentage of individuals receiving Outpatient Methadone Treatment. As well, a smaller proportion of participants in the analytical sample reported cocaine use as their primary drug problem. It appears that, among all these variables, those that show the greatest

difference between the original and current samples are those of time in treatment, primary drug problem, and treatment modality. The differences seen in these three variables are likely related; as the DATOS researchers overrepresented in the follow-up sample those individuals who had spent a longer time in treatment, there likely would be a greater proportion of participants in this sample who had undergone methadone treatment, as this is a modality that often is longer lasting than the other methods of treatment. It follows, then, that there would be a greater proportion of heroin users in the follow-up sample, as methadone treatment is geared towards dependence on opiates.

Table 1

Comparison of Original and Analytical Samples for Continuous Variables.

	N	Mean	SD	Range	Skewness	Kurtosis
Age						
O.S.*	10007	32.52**	7.38	17-55	.481	.102
A.S.*	1533	34.49**	7.39	17-55	.335	-.111
Days in Treatment						
O.S.	10000	124.03**	162.6	0-1021	2.36	6.06
A.S.	1533	268.01**	266.63	4-1016	.93	-.43

*in this table, the initials "O.S." and "A.S." stand for the Original Sample (taken at Intake 1 of the original

DATOS study) and Analytical Sample, respectively.

**p < .01 level.

Table 2

Comparison of Original and Analytical Samples for Nominal Variables.

		Original Sample (n = 10010)	Analytical Sample (n = 1533)
Gender	Male	66%*	60.5%*
	Female	34%**	39.5%**
Race	Caucasian/White	38.3%*	43.2%*
	African-American/Black	46.6%	43.2%
	Hispanic	12.5%	11.6%
	Other	2.0%	3.0%
Primary Drug Problem ^a	No Favorite Drug	6.1%	4.4%
	Alcohol	12.2%	9.0%
	Marijuana	3.0%	2.3%
	Hallucinogen	1.5%	.8%
	Cocaine/Crack	51.0%**	42.1%**
	Heroin	18.3%***	34.1%***
	Narcotics/Other Opiate	3.4%	3.4%
	Sedatives	.8%	.5%
	Amphetamine	2.5%	1.9%
	Other	.2%	.1%
	Inhalants	.1%	.1%
Treatment Modality ^b	LTR	27.7%***	20.9%***
	STI	31.2%***	25.0%***
	OMT	15.4%***	35.3%***
	ODF	25.7%***	18.7%***

^aFor the variable of Primary Drug Problem, the original sample was missing data from 239 participants; the current sample was missing data from 18 participants.

^bFor the variable of treatment modality, the following abbreviations are used: LTR = Long Term Residential; STI = Short Term Inpatient; OMT = Outpatient Methadone Treatment; ODF = Outpatient Drug-Free.

*p < .05

**p < .01

***P<.001

Procedure

Participants were administered a series of interviews at several points throughout treatment as well as at the 12-month follow-up. Measures regarding the three predictor variables of interest in the current research – those of depression, anxiety, and motivation to change – were administered as part of the “Intake 2” interview, which took place 7 to 10 days following admission to treatment. The interview as a whole took approximately 90 minutes to complete, and was conducted in person at the treatment facility by a trained research assistant (Flynn et al., 1997). The dependent variable of number of support group meetings attended during the year following treatment is derived from a single question in the follow-up interview. This interview as a whole also took approximately 90 minutes to complete and was conducted in person in the community. Participants were compensated ten dollars for each interview while in treatment (four interviews in all) and fifteen dollars for the one-year follow-up interview.

Measures

As part of the Intake 2 interview, participants were administered the Symptom Checklist 90 (SCL-90; Derogatis, 1977), a measure of symptoms of psychological disorders. This measure includes scales for measuring an individual’s levels of anxiety and depression. It is from this measure that scales of depression and anxiety used in the current research are derived. The scale as a whole has been extensively examined, and found to be internally reliable and to have convergent validity when tested among a wide variety of both inpatient and outpatient populations (see Derogatis, Rickels, and Rock, 1976; Dinning and Evans, 1977; Green, Gleser, Stone and Siefert, 1975; Wilson, Taylor, and Robertson, 1985). Some question has been raised regarding the SCL-90’s ability to

discriminate between scales (for example, see Clark and Friedman, 1983, and Dinning and Evans, 1997). However, several studies have shown specifically that the SCL-90 can effectively discriminate between depression and anxiety (Deroagatis et al., 1976; Morgan, Wiederman, and Magnus, 1998).

Also during the Intake 2 interview, participants were administered a 20-item subset of the Circumstances, Motivation, Readiness, and Suitability scale (CMRS; De Leon and Jainchill, 1986), developed to measure an individual's level of motivation and readiness for treatment. The CMRS has not undergone the rigorous testing of reliability and validity as has the SCL-90. Primarily, the developers of this scale have evaluated the CMRS and found it to be internally consistent and that scores distribute into the four groups proposed during the development of the measure (De Leon, Melnick, Kressel, and Jainchill, 1994). The current study will employ the composite score from the 20-item subscale as its measure of motivation.

Analysis

As part of the original analyses conducted by the DATOS research group, Etheridge and colleagues (1999) created a subset of participants whose primary substance of abuse was cocaine; thus, this study eliminated those participants in the OMT treatment sites. This subset was used in a regression analysis that examined a number of variables selected as predictors of weekly or more cocaine use at the 12-month follow-up. For the STI and LTR treatment sites, twice weekly or more support group attendance was found to significantly reduce the odds that an individual would return to weekly use (for LTR, odds ratio = .13; $p = .01$; for STI, odds ratio = .3; $p = .01$). Those participants who attended meetings less than twice per week did not fare better with regards to weekly use

than did those who did not attend at all. A significant difference based on meeting attendance was not found among the participants in the ODF modality. Though a significant reduction of use was found in two of the four treatment modalities for those who attended two or more meetings per week, there is not overwhelming evidence that a two-meeting-per-week threshold for substance use reduction exists amongst this dataset.

Three other studies reviewed in the previous chapter (Fiorentine, 1999; Gossop et al., 2003; Gossop et al., 2007) also suggest that there is a threshold of number or frequency of meetings one must attend in order to derive benefit from the support group. However, each of these three studies found a threshold of one meeting per week to be sufficient to predict a significant reduction in substance use. These studies all lend support to the notion of a “therapeutic dose” of support group attendance being necessary for an individual to derive benefits from membership. Based on the findings, this study will dichotomize participants into two groups based on total number of meetings attended during the year following treatment. As the majority of research suggests one meeting per week to be a sufficient dose to bring about change in substance use, the dependent variable of meeting attendance will be divided between those participants attending 52 meetings or more in the follow-up year and those attending less than 52 meetings in the follow-up year.

In order to test the proposed model and the relationships it denotes, a path analysis will be conducted (see Figure 1, repeated at the end of this chapter). The path analysis will be conducted using MPlus software (version 5; Muthén & Muthén, 2007). This analysis provides findings on the goodness-of-fit of the proposed model, as well as the strength of the proposed relationships among variables. This method is used to test

the individual regressions in a way that each regression will account for the information contained in the rest of the model. In addition, this method will allow the Motivation scale to be used both as an independent variable (to predict meeting attendance) as well as a dependent variable (to be predicted by the Depression and Anxiety scales).

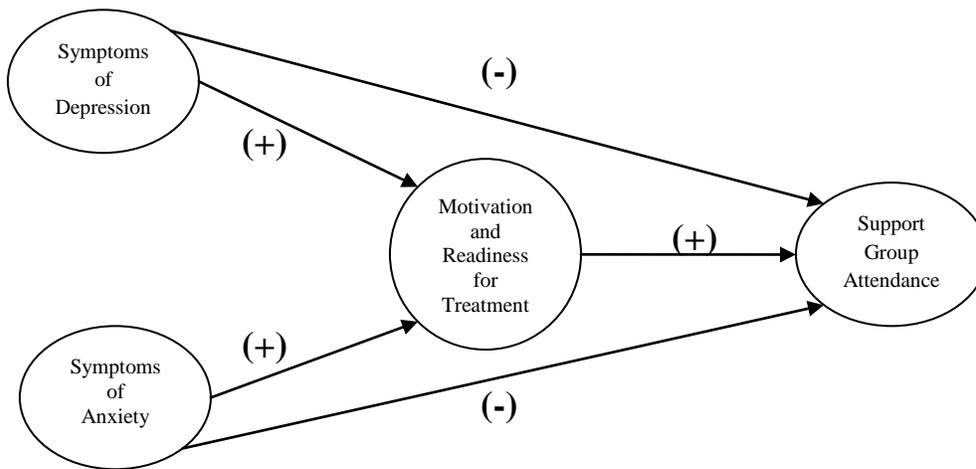
In order to test the fit of the model as a whole, the author will examine the chi-square test of model fit, the Comparative Fit Index (CFI), the Root Mean Square Error of Approximation (RMSEA), and the Standardized Root Mean Square Residual (SRMR). Regarding chi-squared tests, a significant p-value indicates that the model does not fit the given data in this case, it is desirable for the test to be non-significant; however, sample sizes over 200 almost always produce significant results (Kenny, 2009). Given that the current dataset contains 1533 cases, several additional tests will be necessary to gauge an accurate measure of model fit. The Comparative Fit Index (CFI), another test of goodness of fit, is considered acceptable at levels of .90, but preferable at levels of .95 or above (Bentler, 1990). For the Root Mean Square Error Of Approximation (RMSEA), a good fit is indicated by a RMSEA with a value preferably less than .05, but no more than .08-.10 (Kenny, 2009; Browne and Kudeck, 2003). Finally, a good fit is indicated by the Standardized Root Mean Square Residual (SRMR) for values less than .08 (Kenny, 2009). Each of these tests of goodness-of-fit will be conducted using Mplus software (version 5; Muthén & Muthén, 2007).

When combined, these steps should present a clear picture of the relationships between the variables of interest in this study. The study shall determine whether the model proposed above fits the given data. As well, the relationships between each set of variables shall be determined. Finally, the relationships between variables will be tested,

taking into account the effects of other variables in the model. Through this series of steps, the author shall analyze the predictive ability of each variable, when all factors in the model are taken into consideration.

Figure 1

Hypothesized path diagram.



CHAPTER IV

RESULTS

Table 3 describes the original DATOS and current analytical samples with regards to the three scales of interest in the current study (depressive symptoms, anxious symptoms, and motivation for substance abuse treatment). The sample sizes, means, standard deviations, ranges, Cronbach's Alphas, skewnesses, and kurtoses for the original and analytical samples are presented. In addition, a t-test comparison of means was conducted to determine whether significant differences existed between the sample population used in Intake 2 of the original DATOS study and the sample population used in the current research on the scales of anxiety, depression, and motivation.

Cronbach's alphas for all measures in both the original and analytical samples suggest a high level of data reliability. The results from the t-tests suggest significant differences between the original and analytical samples on all three of the scales used in the current study. Participants in the analytical sample were likely to have greater depressive symptoms ($t(10226) = 2.56, p < .01$), greater anxious symptoms ($t(10260) = 6.11, p < .01$), and higher levels of motivation ($t(10286) = 5.53, p < .01$) than participants in the original sample. After examining the distributions for each scale, the two samples do not appear to be very different from one another. The significant t-tests for these variables may be a product of the high sample sizes from both the original and the analytical samples.

The three predictor variables (symptoms of depression, symptoms of anxiety, and motivation for treatment) were evaluated to determine whether the data in each is normally distributed. Both the Intake 2 sample from the original DATOS study and the

analytical sample from the current study were examined. The determinations of normal distribution were made using the Kolmogorov-Smirnov test of normality, and calculated using SPSS. The results of these tests are found in Table 3. None of the data for the three variables were found to be normally distributed. This is not surprising, given the information regarding the skewness and kurtosis of the data also found in Table 3.

Participants in both samples tended to score on the lower end of the depression scale (i.e., few symptoms of depression), score on the lower end of the anxiety scale (i.e., few symptoms of anxiety), and score higher on the motivation scale (i.e., greater motivation for treatment).

One assumption of path analysis is that the scores for variables included in the analysis are normally distributed. Therefore, a natural log transformation was conducted for each variable in an attempt to transform the data to fit a normal curve. However, following this transformation, only one of the three variables in question (the Depression Scale) was normally distributed. Given these results, there does not appear to be an advantage to conducting the path analysis with the transformed data. Therefore, the raw data was used in all subsequent analyses. As well, path analysis using MPlus may be robust against the violation of the assumption of normality.

Table 3

Comparison of Experimental Variables between Original and Analytical Samples

	N		Mean		SD		Range		Cronbach's Alpha		Skewness		Kurtosis		t	K-S Statistic ^b	
	O.S. ^a	A.S. ^a	O.S.	A.S.	O.S.	A.S.	O.S.	A.S.	O.S.	A.S.	O.S.	A.S.	O.S.	A.S.		O.S.	A.S.
Anxiety Scale	8729	1533	.91*	.96*	.92	.89	4.00	4.00	.93	.92	1.17	1.06	.73	.52	6.11*	.162**	.141**
Depression Scale	8695	1533	1.33*	1.40*	.99	.99	4.00	4.00	.94	.94	.54	.48	-.64	-.66	2.56*	.093**	.094**
Motivation Scale	8726	1533	2.76*	2.82*	.29	.24	2.00	1.65	.88	.86	-2.10	-2.27	4.92	6.25	5.53*	.216**	.218**

^ain this table, the initials "O.S." and "A.S." stand for the Original Sample (taken at Intake 2 of the original DATOS study) and Analytical Sample (the frame used in the current research), respectively.

^b Kolmogorov-Smirnov test of normality.

*p < .01

**p < .001

Bivariate Correlations between Variables

Bivariate tests of correlation were conducted between each of the variables of interest in the analytical sample in order to examine the simple relationships among variables. The Pearson correlation test was conducted using SPSS Statistics software (version 17.0.02; SPSS, Inc., 2009) and measured the strength and direction of the association between two variables. These results are reported in Table 4. Significant positive correlations at an alpha level of .001 were found amongst each pair of the four variables analyzed in this study. Individually, the following correlations were found:

- Greater symptoms of depression were positively correlated with attendance at 52 meetings or more in the follow-up year ($r = .11, p < .001$).
- Greater symptoms of anxiety were positively correlated with attendance at 52 meetings or more in the follow-up year ($r = .10, p < .001$).
- Greater levels of motivation were positively correlated with attendance at 52 meetings or more in the follow-up year ($r = .10, p < .001$).
- Greater symptoms of depression were positively correlated with greater levels of motivation ($r = .24, p < .001$).
- Greater symptoms of anxiety were positively correlated with greater levels of motivation ($r = .18, p < .001$).
- Greater symptoms of depression were positively correlated with greater levels of anxiety ($r = .74, p < .001$).

Table 4

Correlation Matrix for Experimental Variables

	Anxiety	Depression	Motivation	# of meetings attended
Anxiety	1	.744*	.180*	.100*
Depression	-	1	.243*	.105*
Motivation	-	-	1	.099*
# of meetings attended	.-	-	-	1

*p < .001

Tests of Model Fit

Several indices were examined to test whether the proposed model fits the data in this study. These results are presented in Table 5. Results from the chi-square measure of model fit indicated that the model does not fit the given data ($\chi^2 = 0.00(0)$, $p < 0.001$). However, this outcome is likely a product of the large size of this project's sample; while the chi-square test is an accurate measure for samples from 75 to 200 cases, samples with larger sizes are much more likely to produce a significant p-value (Kenny, 2009). This is the case in this study, which includes 1533 participants. The Comparative Fit Index (CFI) was found to have a level of 1.00, higher than the preferred level of .95 (Bentler, 1990), indicating a good model fit. The Root Mean Square Error of Approximation (RMSEA) was found to have a value of .00; a preferable result for this measure to indicate good fit is a score less than .05 (Kenny, 2009; Browne and Kudeck, 2003). The Standardized Root Mean Square Residual (SRMR) was found to have a value of 0; a good fit is indicated by scores less than .08 (Kenny, 2009). Though the chi-square

measure indicated a poor fit of the model, the combined findings of the remaining tests indicate that the model generated for this analysis does in fact have a good fit for the given data.

Table 5

Results from Tests of Model Fit

	χ^2	CFI	RMSEA	SRMR
Values	0.00	1.00*	0.00*	0.00*

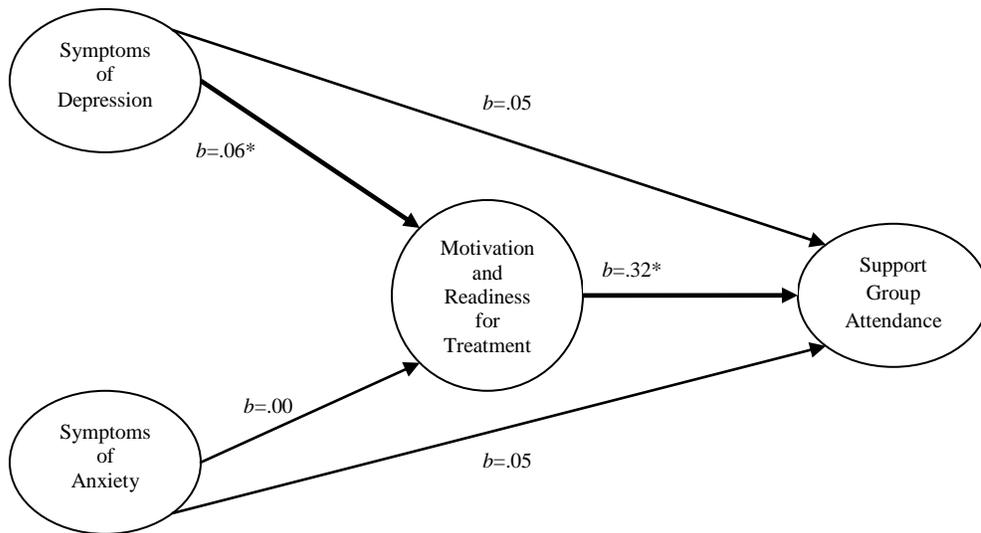
*denotes values which indicate good fit.

Path Analysis

The path analysis simultaneously examined the strength of the specific relationships in the model. Thus, the model is examined as a whole, and can determine whether each "path" represented visually in Figure 1 continues to be significant when accounting for all of the other paths in the model. Two significant paths were found in this analysis. Symptoms of depression were found to be predictive of motivation scale scores ($b = .06; p < .001$); as well, motivation scores were found to be predictive of meeting attendance ($b = .32; p < .001$). The remaining paths were nonsignificant: symptoms of anxiety were not predictive of motivation scale scores ($b = .00, p > .05$); symptoms of anxiety were not predictive of meeting attendance ($b = .05, p > .05$); and despite an indirect influence of meeting attendance by way of influence on motivation, symptoms of depression were not directly predictive of meeting attendance ($b = .05, p > .05$). The hypothesized model with the coefficients and significance levels is displayed in Figure 2.

Figure 2

Hypothesized Model with Analysis Results Added



* $p < .001$

CHAPTER V

DISCUSSION

A large number of research studies have described the efficacy of participation in support groups to assist individuals in reducing or eliminating dangerous use of licit and illicit substances (e.g., Etheridge et al., 1999; Fiorentine, 1999; Gossop et al., 2003; Gossop, Stewart, & Marsden, 2007; McKellar, Stewart, & Humphreys, 2003; Moos & Moos, 2004, 2005, 2006; Moos, Schaefer, Andrassy, & Moos, 2001; Montgomery, Miller, & Tonigan, 1995). Armed with this body of knowledge, as well as personal observations of the benefits gained by their clients, many clinicians encourage clients who present with substance abuse disorders to attend meetings such as the Anonymous organizations, SMART Recovery, Secular Organizations for Sobriety, or Moderation Management. It is the hope of many clinicians that the mutual aid received in such organizations can be of additional benefit to individuals with SUDs in a way that therapy alone cannot address. However, despite overwhelming evidence that organizations such as these greatly improve participants' prognoses, and despite the encouragement of mental health professionals, only about half of individuals who receive formal treatment go on to participate in support groups once treatment ends (Fiorentine et al., 1999; Gossop et al., 2003; Mueller et al., 2007; Project MATCH Research Group, 1997a).

The purpose of the current study was to examine several variables that are commonly addressed in psychotherapy as they relate to post-treatment attendance at substance abuse-related support groups. Specific variables of interest in this study were symptoms of depression and anxiety as well as levels of motivation. It is the author's intention to expand the body of knowledge regarding the recovery process of individuals with substance use disorders other than alcohol, which will hopefully inform clinicians who work with individuals suffering from these

disorders. In particular, the author was interested in whether certain levels of anxiety, depression, or motivation would serve as barriers to participation, or the inverse of this notion, whether certain levels of these variables would encourage participation. Published research devoted to the relationships between these variables appears to be very limited, and the majority of existing research pertains more to alcohol-related disorders rather than disorders related to the illicit use of drugs.

This study employed data collected through the Drug Abuse Treatment Outcome Study [DATOS] (Etheridge et al., 1997; Flynn et al., 1997; Hubbard et al., 1997; Hubbard et al., 2003). The study took as a theoretical base the transtheoretical model of Prochaska and DiClemente (1982; Prochaska, DiClemente, & Norcross, 1992); primarily, the notion that greater levels of distress, as demonstrated by greater symptoms of depression and anxiety, would lead to greater levels of motivation, which in turn would lead to greater attendance at support groups. This notion gave rise to a hypothesized path model, informed by previous research related to each pair of variables of interest. In addition to the paths described above, the model also hypothesized that direct relationships exist between symptoms of depression and anxiety and support group attendance; these hypotheses were also based on available literature related to these variables. The number of support group meetings attended was gauged through participants' attendance in the year following discharge from treatment; this variable was dichotomized between participants attending 52 or more meetings and less than 52 meetings in the follow-up year. The use of the dichotomy is based on literature suggesting that one must attend support groups at least once per week in order to impact a significant change in substance abuse outcomes (Etheridge et al., 1999; Fiorentine, 1999; Gossop et al., 2003; Gossop et al., 2007).

The use of this model allowed the researcher to test all paths in the model simultaneously so that regression analyses for each pair of variables took into account the other pairs of variables in the model. Results of this analysis found significant relationships between symptoms of depression and levels of motivation, as well as between levels of motivation and the number of support group meetings attended. Results of the analysis did not find significant relationships between symptoms of anxiety and levels of motivation, nor did the results find a significant relationship between symptoms of anxiety and the number of support group meetings attended. As well, a direct relationship was not found between symptoms of depression and the number of support group meetings attended.

Comparison of Results to Previous Literature

Symptoms of Depression as Predictors of Support Group Attendance

When applying this study's path analysis to the DATOS data, symptoms of depression as measured by the SCL-90 were not found to significantly predict the number of support groups participants would attend in the follow-up year. The hypothesized relationship between these variables was not supported; the hypothesized model suggested that greater symptoms of depression would lead to less support group attendance. This result lends support to the work of Kelly, McKellar, and Moos (2003), which found no significant difference in meeting attendance between a group of participants diagnosed with comorbid Major Depressive Disorder and a Substance Use Disorder, and a group of participants diagnosed with only a substance abuse disorder. The current study and the study by Kelly et al. differ in that participants in the current study did not necessarily carry a diagnosis of Major Depression; rather, the current study employed a scale of depressive symptoms. In fact, the distribution of depression scores for the current sample was skewed towards the lower end of the scale, suggesting a lower number of

depressive symptoms amongst participants in the sample. Despite these differences, both studies find that one's level of depressive symptoms or presence of a diagnosis does not directly predict whether one will be more or less likely to attend support groups following treatment.

Symptoms of Anxiety as Predictors of Support Group Attendance

When applying this study's path analysis to the DATOS data, symptoms of anxiety as measured by the SCL-90 were not found to significantly predict the number of support groups participants would attend in the follow-up year. This result did not support the hypothesized relationship between these two variables; the hypothesized model suggested that greater symptoms of anxiety would lead to less support group attendance. Little research had been previously published on the relationship between these two variables. The current study is the first known research conducted to examine the possibility of such a relationship. However, it may be that previous researchers have also found nonsignificant results, but these results have not been published.

Level of Motivation as a Predictor of Support Group Attendance

When applying this study's path analysis to the DATOS data, level of motivation for treatment as measured by the modified version of the CMRS was found to significantly predict the number of support groups participants would attend in the follow-up year. Higher levels of motivation for treatment were associated with meeting attendance of 52 meetings or greater. This finding supported the relationship between these two variables suggested in the hypothesized model, which suggested that greater levels of motivation would predict greater meeting attendance.

This result supports the findings of Kelly and Moos (2003), described in Chapter II. The studies differ in that Kelly and Moos measured dropout from 12-step groups among individuals

who had undergone treatment and had at one point participated in support groups. The bar was set considerably lower in the Kelly and Moos study in that individuals who attended even one meeting in the follow-up year were considered "members," whereas in the current study, 52 meetings in the follow-up year was chosen as the level needed to denote significant participation. Kelly and Moos used a subscale of the SOCRATES measure to determine motivation among participants; this scale is more closely related to the transtheoretical model (and readiness for change in general) whereas the CMRS is more specifically focused on one's readiness for substance abuse treatment.

The results from Cloud's (2003) secondary analysis of the Project MATCH data were somewhat mixed with regards to a relationship between one's level of motivation and attendance at support groups. Cloud's dependent variable in this regard was similar to the current study in that participants were dichotomized between those attending support groups once per week or more and those attending less than once per week. The variables used in Cloud's study differed from the current study in that Project MATCH was solely concerned with treatment of alcoholism. As a result, Cloud's dependent variable solely pertained to attendance at Alcoholics Anonymous meetings, and several predictor variables were taken from the Alcohol Use Inventory. Cloud found that, while variables pertaining to motivation did not significantly predict meeting attendance, variables pertaining to *action orientation* (such as previous attempts to deal with drinking and taking steps to deal with drinking) were significantly predictive of meeting attendance. In this regard, the current research is supportive of Cloud's findings in that participants in the current study who were more motivated to participate in substance abuse treatment were also more motivated to participate in support groups following treatment.

Depressive and Anxious Symptoms as Predictors of Level of Motivation

When applying this study's path analysis to the DATOS data, symptoms of depression as measured by the SCL-90 were significant predictors of one's level of motivation for treatment as measured by the modified CMRS. A higher number of depressive symptoms were found to be predictive of higher levels of motivation. The direction of this relationship supported the hypothesized model, which also stated that higher levels of depressive symptoms would indicate a higher level of motivation. Furthermore, this finding is supportive of Prochaska's and DiClemente's transtheoretical model, which states that people are more likely to change when they experience higher levels of distress.

This result supports the findings of Blume, Schmaling, and Marlatt's (2001) study that examined the relationship between symptoms of depression and levels of motivation. As in the current study, depressive scores in Blume et al.'s study represented symptoms of depression rather than an actual diagnosis of depression, and in many cases participants' depressive symptoms were at a subclinical level. The research of Blume et al. utilized the Brief Readiness to Change Questionnaire, a measure more closely aligned with the transtheoretical change model than the current study's CMRS; this measure produces scores assessing an individual's adherence to the model's stages of precontemplation, contemplation, and action. The research found higher depression scores on the Beck Depression Inventory among participants who also scored higher in the areas of contemplating change and taking action towards change. This finding resonates with that of the current study, in which higher scores on the SCL-90 Depression scale predicted higher scores on the CMRS.

The work of Smith and Tran (2007) was partially supported by the current study. Smith and Tran found both depression and anxiety, when considered in separate regression analyses, to be positively predictive of one's level of motivation. In other words, higher symptoms of anxiety and depression would indicate a higher level of motivation, as suggested in the transtheoretical model. However, when these variables were considered together, these researchers found anxiety to have a greater predictive ability, and suggested that a high correlation between the two predictive variables to be the cause of significant results in the case of depressive symptoms. On this matter the current study found results opposite of these. When individually correlated with motivation scores, both depressive and anxious symptoms were found to be correlated with motivation. However, when considered together as part of the path analysis, anxiety scores were no longer found to have a significant predictive ability, while higher depression scores continued to significantly predict higher levels of motivation.

It is important to note in this case that, while both the Blume et al. and Smith and Tran studies employed an instrument that measured one's motivation to change a behavior (the RTC), the current study employed an instrument that measured one's motivation to engage in treatment (the CMRS). Also of note is that both of these described studies were targeted towards alcohol use disorders, whereas the current study was targeted towards substance abuse disorders. In fact, the Blume et al. study specifically excluded individuals with substance use disorders other than alcohol, whereas in the DATOS study, individuals with only an alcohol use disorder were excluded. Differing instrumentation as well as differing substances of abuse may have led to the differing results between the current study and Smith and Tran study.

Overall, the findings of the current study were very consistent with previously published literature pertaining to the variables of interest. However, unlike most of these previously published works, which performed individual regressions of two variables (except in Smith and Tran's 2007 study), the previous study analyzed these variables concurrently. It is important to note that the previous research continues to be supported when multiple variables are considered in unison. The current research thus strengthens the findings of former research in this area, and in particular provides additional credence to the transtheoretical model as an explanation of how people change. As well, many of the studies reviewed pertained to alcohol use disorders; the current study suggests that these results also apply to those individuals suffering from substance use disorders.

Clinical Implications

Paramount to this research is how this knowledge may be used by clinical professionals to encourage clients presenting with substance use disorders to participate in support groups beyond the means of simple verbal encouragement and referrals. Both significant and nonsignificant pathways in the results of the path analysis can increase one's knowledge of this process.

The only direct predictor of support group attendance found to be significant in this study was that of one's motivation for participation in substance abuse treatment. This finding brings about recommendations for clients both on the high and low ends of the motivation scale. Particularly for those individuals that demonstrate a low level of motivation, clinicians would be advised to include interventions that are aimed at increasing these levels. For example, Motivational Interviewing techniques (see Miller and Rollnick, 2002) may be particularly adept at increasing one's likelihood of taking greater action towards change. These techniques focus

on accurately reflecting an individual's emotional state and accepting the ambivalence that an individual may feel about changing. However, Motivational Interviewing also works to create a discrepancy between the client's current behavior and the client's goals. In this way, a therapist employing Motivational Interviewing helps the client to resolve the ambivalence regarding her behavior herself, and come to her own conclusions regarding how she wants to proceed with change (Miller and Rollnick, 2002). In using this method, a therapist would not particularly press a client towards participation in support groups; however, the increase in motivation to change may also increase the likelihood that the client would choose this path towards recovery. One must keep in mind, however, that Motivational Interviewing is primarily conducted in individual settings. In most cases, the primary mode of service delivery used in substance abuse treatment is group therapy. Though a therapist may be able to incorporate some of these techniques in a group setting, additional interventions geared towards increasing motivation may be necessary when conducting therapy in a group format.

Miller and Rollnick (2002) suggest that Motivational Interviewing may not be as helpful to those individuals who present in therapy demonstrating little resistance and already appearing prepared to change. Therefore, additional recommendations are necessary for those individuals who present in therapy with a higher motivational level, or who, through the methods described above or through other techniques, become more interested in changing their behavior than when they first entered therapy. In these cases, clients may benefit more from education regarding the efficacy of support groups. Though these clients may be prepared to make changes regarding substance use, they may not be knowledgeable about available resources, and as well may not be knowledgeable about what resources have shown to be effective. Apart from simply providing information regarding support groups in the client's area, therapists can use the research

presented in Chapter II of this paper to inform patients of the effect that attendance at support groups has been shown to have on substance use outcomes. Both practical knowledge and the findings of previous research may lead a client to decide to attend support groups, whereas without this knowledge, a client may not make this decision.

The second significant finding of the current study, that which found a positive significant relationship between depression and motivation, is firmly rooted in the transtheoretical model's concept that greater distress brings about greater willingness to change. Given that the pathway from level of depression to level of motivation continues on to this model's final variable of support group attendance, this finding suggests that individuals who are depressed and more motivated for treatment may be particularly primed to begin an association with support groups. Those individuals who exhibit greater symptoms of depression and are more motivated may be better prepared to make changes with regards to substance use, and one such change may be taking action in the form of attendance at support group meetings. Though no direct relationship was found between depressive symptoms and the number of meetings attended, it may be that the fellowship found in support groups and a reduction of feeling alone in one's struggle with substance dependence is particularly attractive to those individuals experiencing symptoms of depression.

This information suggests better prognoses for those individuals who are more depressed; therefore, the inverse of this suggestion is true as well, that individuals who present with SUDs who are *not* depressed may be *less* likely to participate in support groups. In light of this, clinicians may be advised that more attention may need to be directed towards their less depressed clients. More intensive treatment may be necessary; as the norm for substance abuse counseling is a group format, it may be that more frequent groups, or individual counseling to

supplement groups would be helpful for these individuals. In addition, Motivational Interviewing (Miller and Rollnick, 2002) may be particularly useful when working with these clients, especially individuals who demonstrate a low level of motivation for treatment *and* a low level of depression. While individuals with higher levels of depression may be more motivated due to “greater distress,” the technique of demonstrating the discrepancy between a client’s ideal and his current state may serve to create this “distress” in clients who have lower symptoms of depression. Speaking in a more general sense, clinicians may benefit simply from awareness that these patients may be at greater risk for relapse, and be mindful of this during sessions.

The pathways in this study's path model which were found to be nonsignificant also provide useful knowledge about the process of recovery and provide further recommendations to clinicians. One aim of the study was to determine whether the data suggested certain barriers to attendance at support groups. Given that neither symptoms of anxiety nor symptoms of depression were found to predict one's meeting attendance, the results of this study suggest that these states do not pose such a problem. Therefore, it may be erroneous for a clinician to think that, solely because a client exhibits symptoms of depression or anxiety, that that individual would be a poor match for a support group. Neither does the data support the notion that symptoms of depression or anxiety must be alleviated before one can be expected to attend support groups. Of course, there may be individual situations - for example, a client who has extreme levels of social anxiety - in which symptoms of these disorders may serve as a barrier to support group attendance. However, one should not look simply at the presence of such symptoms as being contraindicative of support group attendance; clinicians are advised not to be reluctant to refer their clients to such groups based on the presence of depressive or anxious symptoms.

One must keep in mind in treatment planning that a very limited number of variables were examined in the current study. Though the findings of this study suggest possible directions that clinicians may take therapy for individual clients, the suggestions made in this section are by no means absolute. The variables used in this analysis only explain a small portion of the variance of what may predict whether one will or will not attend support groups after formal treatment has ended. One must consider each individual as a whole, and may come to different conclusions given other characteristics or factors in a client's life.

Limitations of the Study

The aim of this study was to investigate several variables that commonly present themselves as problems in psychotherapy as they relate to attendance in support groups. To this end, any number of variables that may very well be significant predictors of support group attendance were not included in analysis. Demographic variables, substance use experiences, or treatment experiences such as type of setting and length of time may well prove to be better predictors of support group attendance than those variables chosen for this analysis. The choice to exclude such variables was made purposefully; though information about these possible predictors may be useful to practitioners in a sense of creating a "profile" as to which individuals might be more successful in support groups, they would not be as useful in planning interventions. A therapist does not have the ability to change an individual's age or their history of use; however, interventions can be planned to target the three predictors of depressive symptoms, anxious symptoms, and motivation for treatment that were included in this study.

As a secondary analysis of a data set, this study was limited to the variables, measures, and data collected in the original study. Intake data collection for the DATOS project was conducted between the years of 1991-1993. As 17 years have passed since the completion of

data collection, it may be that changes in use patterns as well as treatment have changed between this time and 2010. Incorporating these possible changes may impact the results of this study. In addition, other common problems that may present themselves in therapy (e.g., personality disorders or marital discord) could not be included in this analysis as data related to these variables was not collected during the original DATOS intake. As well, the researcher was bound by the measures used by the original research group. In particular, the CMRS scale bears mentioning with regards to the study's limitation. The questions on this scale pertain particularly to one's willingness to engage in substance abuse treatment; therefore, the scale does not necessarily measure one's motivation to change a behavior. The use of a scale such as the Brief Readiness to Change Questionnaire (Rollnick et al., 1992), modified for substance abuse rather than excessive drinking, may have better captured one's level of motivation to change. The reader must bear in mind when reviewing the results of the study that readiness to engage in treatment does not necessarily equate with readiness to change a behavior.

While not necessarily a limitation, one must take into account the distribution of scores on the three scales used for prediction. Scales of symptoms of depression and anxiety were both skewed to the lower end of the scales; therefore, the majority of clients in the study likely had subclinical levels of depression and anxiety, and would likely not be diagnosed with disorders pertaining to either of these constructs. However, it is important to note that those individuals in the follow-up sample had significantly higher scores on each of these scales than the individuals in the original DATOS sample. As the original sample had a much larger number of participants, it may be interpreted that those participants included in the present analysis had a significantly higher number of symptoms of depression and anxiety than those in the general treatment population. With regards to motivation for substance abuse treatment, scores in the

analytical sample were skewed to the higher end of the scale; scores were significantly higher in the analytical sample than in the original sample. This would suggest that those in present study were more motivated to participate in treatment than those in the general treatment population. Different results may be found in a sample that included individuals at higher levels of depressive and anxious symptoms, or individuals with lower levels of motivation.

As stated in Chapter III, the follow-up sample for DATOS purposefully overrepresented those clients who had spent a longer time in treatment (Hubbard et al., 1997). As well, a number of treatment sites considered to be less stable (and as a result, participants attending these sites) were not included in the follow-up survey. A correlation was found between the amount of time spent in treatment and substance use outcomes. These facts taken in totality suggest that those in the DATOS follow-up sample were likely to have better prognoses than those in the original sample. As the analytical sample used in the current sample is a derivation from the DATOS follow-up, we may conclude as well that this sample is overrepresented by participants whose prognoses are better than those in the general population.

Future Directions

This is the first known study to use the method of path analysis to compare the relationships between symptoms of depression and anxiety, and level of motivation, to support group attendance. In general, the relationship of participation in support groups to these variables has received very limited study; in particular, the relationship of anxiety to attendance at support groups has not been studied at all. As such, the results of this research must be confirmed by further research using different samples. The limited research base from which this study was drawn suggests that these findings can only be interpreted as preliminary.

As one major limitation of the study was that the data from the DATOS project were 17 years old, it would be useful to know whether the current client population would exhibit similar results to this study. The methods of the current study would be well served to be replicated with a more recent sample of participants to gauge whether changes in use patterns, treatment, or client population have an effect on the results obtained through the current analysis. The expansion of variables included for analysis may bring about a greater understanding of the forces that determine whether an individual will or will not participate in support groups.

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