

Social network ties and goal formation: Correlates of treatment entry and reduced alcohol use
following treatment completion

by

Orion Peter Mowbray

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Doctoral Committee

Associate Professor Mary C. Ruffolo, Co-Chair
Professor Denise J. Sekaquaptewa, Co-Chair
Research Assistant Professor James A. Cranford
Associate Professor Brian E. Perron

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Abstract

While effective treatment for alcohol use disorders (AUDs) exists, only about 28% of individuals suffering from AUDs seek help for problems (Cohen, Feinn, Arias, & Kranzler, 2007). The National Institute of Health strategic initiative of systems-thinking approaches to health (USDHHS, 2010b) suggests that social network ties may reveal important keys to how persons experiencing health problems, including AUDs, seek treatment. Additionally, approximately 60% of individuals in treatment for AUDs will relapse within the first year following alcohol treatment (Maisto, Pollock, Cornelius, Lynch, & Martin, 2003; Whitford, Widner, Mellick, & Elkins, 2009). One mechanism of change that could reduce relapse of alcohol use may be the goals individuals adopt upon entry to treatment. The objectives of this dissertation are 1) identify the characteristics of social network ties among persons with experiencing AUDs, 2) examine how social network ties influence treatment use for alcohol dependence, and 3) to examine whether goals individuals adopt concerning drinking in early treatment influence subsequent alcohol use following treatment completion. Objectives 1 and 2 examine wave 2 of the National Epidemiologic Survey on Alcohol and Related Conditions. Objective 3, examines the Life-Transitions Study (LTS) (Robinson et al., 2011). Results suggest that social networks of individuals with AUDs are smaller in size and less diverse. Additionally, social network ties of individuals with AUD play a moderating role in seeking treatment such that individuals with high level of alcohol consumption and more social ties are more likely to seek treatment than individuals with high levels of alcohol consumption and few network ties. Finally, controlling for differences in who adopts a goal of abstinence from alcohol, individuals who adopt a goal of abstinence at treatment entry are likely to have more percent days abstinence and more days since last consuming alcohol compared to individuals who adopt a non-abstinence

goal. These findings offer several implications for social work practice including the utilization of social networks as a resource among individuals with AUDs, the identification of high risk AUD groups least likely to seek treatment, and risk factors associated with higher levels of alcohol use following treatment for AUDs.

Chapter 1

Overview and Introduction

Introduction and summary of literature

The overall objective of this dissertation is to identify the characteristics of social network ties among persons who are experiencing alcohol use disorders (AUD), how social network ties influence AUD treatment use, and whether the goals an individual adopts concerning their drinking in early treatment influence their subsequent alcohol use following treatment completion.

Costs of alcohol-related problems

An estimated 9.7 million Americans have experienced alcohol abuse and 7.9 million have experienced alcohol-dependence in the past year (Grant et al., 2004). Alcohol abuse is a pattern of drinking that results in harm to one's health, interpersonal relationships, or ability to work. DSM-IV criteria for alcohol abuse include the failure to fulfill major responsibilities at work, school, or home, drinking in dangerous situations (such as drinking while driving or operating machinery), legal problems related to alcohol, such as being arrested for drinking while driving or for physically hurting someone while drunk, and continued drinking despite ongoing relationship problems that are caused or worsened by drinking (APA, 2000). DSM-IV criteria for alcohol dependence include increased tolerance (a need for increased amounts of alcohol to achieve intoxication or a diminished effect with continued use of the same amount of alcohol); experiencing withdrawal symptoms associated with a reduction in alcohol use; unsuccessful

efforts to cut down or control alcohol use; large amounts of time spent in activities necessary to obtain alcohol, use alcohol or recover from its effects; an abandonment of social, occupational, or recreational activities because of alcohol use; and continued alcohol use despite knowledge of having a persistent or recurrent physical or psychological problem that is likely to have been caused by alcohol (APA, 2000).

While effective treatment exists, only about 28% of individuals suffering from alcohol abuse or dependence seek help for their problems (Cohen et al., 2007). Alcohol-related problems are a significant public health concern and are associated with many problems including (but not limited to) acute injury, neurologic impairment, psychiatric and drug comorbidity, and certain cancers (Hasin, Stinson, Ogburn, & Grant, 2007; Kopelman, Thomson, Guerrini, & Marshall, 2009; Rehm et al., 2009). Additionally, the financial costs of alcohol-related problems in the United States exceed the costs of cancer and coronary heart disease. Specifically, alcohol-related costs totaled an estimated \$184 billion in 1998 which included adverse medical consequences, lost worker productivity, increased crime, higher accidents, and exacerbated treatment/prevention costs (Harwood, Fountain, & Livermore, 1998).

An objective of *Healthy People 2020* is to increase the number of individuals diagnosed with AUDs who receive alcohol treatment (USDHHS, 2010a). AUDs include the disorders of alcohol abuse and alcohol dependence. Alcohol reduction interventions have been shown to reduce health care costs and other costs to society associated with misuse of alcohol (Holder et al., 2000; Zarkin et al., 2010). Some evidence has shown that treatments for AUDs can be effective and can increase one's likelihood of recovery from alcohol problems (Grant et al., 2004; Moos & Moos, 2006; Moyer, Finney, Swearingen, & Vergun, 2002). Thus, it is critical to increase the number of individuals with AUDs who receive treatment.

Social network ties and alcohol use disorders

Generally, social network ties are collections of individuals, linked in some manner by social structure, and are connected through social interaction. Social network ties assess participation in different types of social relationships. Here, social network ties are defined as the number of social roles (types of social relationships) for which respondents report active social interaction (Brissette, Cohen, & Seeman, 2000). There are two major ways in which social network ties are operationalized: Social network diversity, and social network size (Berkman & Syme, 1979; Brissette et al., 2000). Social network diversity (SND) refers to heterogeneity in the composition of networks (Cohen et al., 1997). Social network diversity assesses the number of social roles an individual occupies through interaction in various groups (family, work, community, etc.) Social network size (SNS) refers to the number or density of members within a network (Brissette et al., 2000). Social network size assesses the number of persons an individual interacts with across all social roles for which they occupy.

Given the strong relationship between social network ties and health and well-being, identifying the characteristics associated with SND and SNS among those with an AUD can inform translational efforts. Associations between social network ties and health and well-being may be driven by two different properties including 1) increases in the diversity of social networks (Cohen, 2004) and 2) increases in network size (Brissette et al., 2000; House, Landis, & Umberson, 1988). However, to the author's knowledge, there are no studies to date that directly compare these two properties of social network ties and their associations with health and well-being among a sample of individuals with AUDs.

Direct comparisons aside, both SND and SNS have a strong relationship with health and well-being in general populations (Cohen et al., 1997; House et al., 1988). Those with high SND

experience a host of positive outcomes, including a large base to consult with during illness (Perry & Pescosolido, 2010), greater physical and mental health functioning (Caplan, 1974; Cohen et al., 1997), and improved treatment response in medical contexts (Helgeson, Cohen, & Fritz, 1998). Those who report larger SNS consume less alcohol (Pressman et al., 2005; Sorkin, Rook, & Lu, 2002), and are at lowered risk for problem drinking (Heinrich & Gullone, 2006) than those with small SNS.

Small social networks are a risk factor among those with AUDs

Those with extremely few social network ties (between 1 and 3) are at risk for experiencing social isolation (Brissette et al., 2000). Those with few social network ties are less likely to receive benefits of social support compared to those with many social network ties (Berkman & Syme, 1979). Past research suggests significant differences in alcohol involvement between those who have few social network ties and those with many network ties (Cacioppo et al., 2000, 2002), but these measures are drawn from non-clinical samples and have produced inconsistent findings (Cacioppo et al., 2002, 2002; Page & Cole, 1991; Sadava & Pak, 1994).

Additionally, those who report few social network ties consume more alcohol (Pressman et al., 2005; Sorkin et al., 2002), and are at higher risk for increased alcohol involvement (Heinrich & Gullone, 2006) than those with many social network ties. Further, those with few social network ties also experience lowered support from friends and family to adopt healthy behaviors and access treatment when needed (Cacioppo, Hawkley, & Berntson, 2003; Rook, 1984; Rubinstein, Lubben, & Mintzer, 1994).

The available data suggest that few social network ties are a risk factor associated with AUDs. However, from this literature, it is not clear which characteristics of social network ties are associated with elevated risk factors associated with alcohol use among individuals with

AUDs. It is possible that both small social network diversity (SND) and small social network size (SNS) are associated with elevated risk for alcohol use among individuals with AUDs, but this claim remains untested.

A second association with few social network ties that has been documented is the presence of a co-occurring AUD and mental health disorder. Individuals with co-occurring disorders tend to have fewer social network ties than persons without an AUD or mental health disorder (Tracy & Biegel, 2006). Additional research suggests that among persons with co-occurring AUD and mental health disorders, a larger number of social network ties, paired with higher levels of social support, increase AUD treatment use (Drake, Mercer-McFadden, Mueser, McHugo, & Bond, 1998). However, social network measurement among those with co-occurring disorders often varies across studies, leaving uncertainty concerning which dimensions of social network ties are most likely to be influenced by the presence of co-occurring AUD and mental health disorders. It is possible that both small social network diversity (SND) and small social network size (SNS) are associated the presence of a co-occurring mental health disorder among individuals with AUDs, but this hypothesis remains untested.

Third, it is not understood which factors associated with socioeconomic status (SES) are related to social network ties among individuals with an AUD. Those who are unemployed and possess lower education may have fewer social network ties (Westermeyer, Thuras, & Waaijer, 2004). Previous research on whom, in the general population, is most likely to experience fewer social network ties suggests that socioeconomic status may be influential, but these results often derive from non-representative samples and offer inconsistent patterns of findings.

Fourth, clinical factors, such as alcohol involvement (the number of criteria an individual meets for DSM-IV alcohol abuse or alcohol dependence) (APA, 2000) are potential correlates of

fewer social network ties (Favazza & Thompson, 1984; Moos, Fenn, Billings, & Moos, 1988), but it is not clear how the characteristics of social network ties, including SND and SNS, relate to alcohol involvement. It is assumed that the relationship may be bi-directional. However, given the scant evidence suggesting that few social network ties are a risk factor among individuals with AUDs, it is likely that the directional relationship stating that few social network ties leads to an increased use in alcohol involvement may be a more accurate statement than the converse – that increased alcohol involvement leads to fewer social network ties. Research on alcohol use among adolescents suggests that as individuals increase their alcohol involvement, they may develop social network ties with other alcohol users, but their actual social network size often remains unchanged (Burk, van der Vorst, Kerr, & Stattin, 2012; Knecht, Burk, Weesie, & Steglich, 2010), suggesting that decreases in network ties does not precipitate increased alcohol use. However, it remains untested whether an association exists between social network ties, such as SNS and SND, among individuals with an AUD and level of alcohol involvement.

Social network ties and treatment use among individuals with an AUD

While the available literature concerning treatment use and measures of social network ties among persons with an AUD is sparse, preliminary results suggest the two are related. Among those with an AUD, those with many social network ties experience a host of positive outcomes, including a large base to consult with during illness (Conner & Heywood-Everett, 1998), greater physical and mental health functioning (Caplan, 1974; Cohen et al., 1997), and improved treatment response in medical contexts (Helgeson et al., 1998).

In untreated samples, many persons with an AUD report high encouragement from their social network ties to enter treatment (Room, Greenfield, & Weisner, 1991), and those currently in AUD treatment report even higher levels of encouragement to reduce their alcohol use

compared to those who are untreated (Weisner, 1993). Additionally, when social network ties are influential in treatment entry, social support increases and positive treatment outcomes also increase (Bond, Kaskutas, & Weisner, 2003). Further, treatment evaluation data suggests that when persons with an AUD experience “pressures to change” from their social network ties, such as requests from partners to enter treatment, others endorse sobriety, and the presence of those who provide a supportive environment, treatment use increases (Azrin, Sisson, Meyers, & Godley, 1982; Barber & Crisp, 1995; Garrett et al., 1998; Meyers, Dominguez, & Smith, 1996).

Limitations of social network models of treatment use

Available research on the relationship between social network ties and treatment use for alcohol dependence presents conflicting findings. On the one hand, increased social network ties can serve as a substitute for alcohol dependence treatment through promoting natural recovery through continual feedback concerning drinking behaviors (Humphreys & Noke, 1997), and increased social support (Maulik, Eaton, & Bradshaw, 2009). However, the number of social network ties can, at times, serve as a positive influence for pursuing treatment for alcohol dependence through transmitting social norms concerning when cutting down on alcohol use is needed (Weisner, 1993), and transmitting information about where to access treatment services, (Gourash, 1978).

One possible explanation for the divergent findings associated with the influence of social network ties and treatment use concerns the moderating role that social network ties may play in the relationship between alcohol consumption and treatment use. For example, an individual with alcohol dependence who has a high level of alcohol consumption and many social network ties may receive the positive influences from social network ties, but at the same time, these may not possess the resources to provide any assistance towards treating alcohol

dependence. Additionally, an individual with alcohol dependence who has a high level of alcohol consumption and few social network ties may be offered less knowledge from their social network ties concerning whether drinking is excessive and what an individual can do about it (vis-à-vis seeking treatment). With these divergent findings in mind, current research on social network ties can be improved by examining the ways in which social network ties serve as a moderating variable between factors known to influence treatment use.

Drinking goals in early treatment subsequent and alcohol use

While there is considerable attention in alcohol research to examine factors related to treatment entry, there is also a consistent focus on “mechanisms of change” that occur after an individual enters treatment that lead to positive outcomes including reduced alcohol use (Longabaugh et al., 2006). The selection of drinking goals at treatment entry is a promising, yet under-studied, mechanism of change which may have an impact on alcohol use following treatment (Adamson et al., 2010). Examining drinking goals can have immediate clinical appeal. Clinicians frequently work with clients to establish a drinking strategy, and to instill motivation for maintaining that strategy throughout treatment (DiClemente, 2007).

However, it is unclear whether a drinking goal of abstinence reduces alcohol use following treatment. For example, some research has shown that those who desire a non-abstinence drinking goal upon treatment entry continue to drink at heavy levels following treatment, compared to those who select a drinking goal of abstinence (Adamson & Sellman, 2001). Yet, other research has shown that when clients were allowed to establish their own goals (either abstinence or non-abstinence), those who adopted a non-abstinence drinking goal experienced drinking problems for a shorter period of time and were more accurate in predicting whether they could meet their drinking goal (compared to those who established abstinence as a

drinking goal) (Pachman et al., 1978). A detailed and refined approach to examining alcohol use between individuals who adopt abstinence and individuals who adopt a non-abstinence drinking goal is needed, especially from a longitudinal perspective

Proposed Dissertation Structure

Conceptual framework

Chapter 2 is informed by a social network framework which posits that social networks are influenced heavily through key social and clinical factors including sociodemographics (and their accompanying socioeconomic status) as well as the experience of mental health related problems (Cohen & Janicki-Deverts, 2009). Figure 1.1 presents the conceptual design for chapter 1.

Chapter 2 is informed by a network model of mental health treatment use positing that social network ties provide valuable resources that influence the decision to seek AUD treatment, and that social network ties moderates the relationship between the level of alcohol consumption an individual experiences and treatment use for alcohol dependence (Humphreys & Noke, 1997; Weisner, 1993). Figure 1.2 presents the conceptual model for chapter 2.

Chapter 3 is informed by research examining mechanisms of change in reduction of alcohol use following treatment to examine whether the goals an individual adopts concerning their drinking in early treatment influence their subsequent alcohol use following treatment completion (Adamson et al., 2010; Longabaugh et al., 2006). Figure 1.3 presents the conceptual model for chapter 3.

While scant research suggests that social network ties influence treatment and outcomes among persons with AUDs, measures capturing social network ties vary widely across studies have not been assessed in terms of their validity. Social network research among persons with

AUDs can be significantly improved through 1) adopting valid measures of social network ties (Brissette et al., 2000), 2) increasing the potential for capturing the breadth of social network ties (Smith, Cleeland, & Dennis, 2010), and 3) relying on less restricted count data to examine social network ties (Groh, Jason, Ferrari, & Halpert, 2011). Data from the National Epidemiologic Survey on Alcohol Related Conditions (NESARC) can contribute to these improvements. Measures of social network ties used in the NESARC have strong psychometric properties (Brissette et al., 2000). These measures are known to capture the size and breadth of social network membership, and they offer an examination of social interaction among social network ties within a restricted time frame (past two weeks).

Additionally, research examining abstinence as a drinking goal can be improved through 1) addressing whether the goal of abstinence produces the same or different alcohol-use outcomes following treatment compared to a goal of non-abstinence and 2) examining whether current findings examining drinking goals are generalizable to the United States, where the vast majority of treatment centers advocate only abstinence. Results from other countries may not generalize to associations with drinking goals where abstinence is the primary goal of treatment (such as in the United States) (Cox et al., 2004; Rosenberg & Davis, 1994). Data from the Life Transitions Study (LTS) (Robinson et al, 2011) can contribute to these improvements. The measures available in the LTS contain a highly detailed examination of alcohol use 3 years following the formation of drinking goals in early treatment. Further, all participants in the LTS are from a U.S. sample.

Chapter 2: Correlates of social network diversity and social network size

Chapter 2 examines whether social network ties are influenced through key social and clinical factors including sociodemographics (and their accompanying socioeconomic status) as

well as the experience of mental health related problems. This chapter will address two questions: (1) What differences are there in the social networks in terms of their size and diversity among individuals with alcohol abuse, alcohol dependence, and those from the general population? (2) Controlling for important social and clinical differences, do differences in social networks in terms of size and diversity still emerge between individuals with alcohol dependence, alcohol abuse, and the general population?

To address these questions, data from NESARC Wave 2 were analyzed in this chapter. Measures of social network ties are found only in wave 2 of the NESARC. The second wave of NESARC involved re-interviews of Wave 1 respondents. The response rate of Wave 2 (based on the Wave 1 sample) was approximately 70%. Thus, the effective sample size of Wave 2 is $N = 34,653$ (Grant, Kaplan & Stinson, 2007).

An examination of collinearity between the measures of social network ties (social network diversity and social network size) using a variance inflation factor (VIF) method suggests that including both measures in the same analysis is problematic, with VIF metrics for social network size and the interaction term of social network size and social network diversity exceeding the cut-point of 10.0. Thus, social network size and social network diversity are examined in separate analyses (Hamilton, 2008).

Chi-square tests of independence and multiple linear or Poisson regression are the primary analytic techniques for chapter 2. Chi-square tests of independence examine whether categorical groups differ significantly within dependent variables of concern. Multiple linear or Poisson regression permits examining the contribution of multiple independent variables in explaining the variance of one dependent variable with either a normal or a non-normal distribution (Dobson, 2002; McCullagh & Nelder, 1989). All analyses account for the complex

design of NESARC using the strata, weight, and cluster variables (Grant et al., 2007). STATA V12 (StataCorp, 2011) is used for descriptive analyses, variable screening, and data management. Multiple linear or Poisson regression analyses are conducted in STATA V12. All hypotheses include the NESARC sample of respondents that met criteria for DSM-IV lifetime alcohol abuse, alcohol dependence or have no lifetime history of alcohol use disorder.

Chapter 3: Social network ties and treatment use for alcohol dependence

Chapter 3 examines whether social network ties provides valuable resources that influence the decision to seek AUD treatment, and whether the relationship between alcohol consumption and treatment use for alcohol use dependence is moderated by social network ties (Humphreys & Noke, 1997; Weisner, 1993). It is hypothesized that first, controlling for known factors related to treatment use, higher alcohol consumption is a correlate of treatment use for alcohol dependence. Second, controlling for known factors related to treatment use, social network ties moderate the relationship between the alcohol consumption and treatment use. High alcohol consumption paired with larger number of social network ties increases the probability for treatment use. However high alcohol consumption paired with smaller number of social ties will result in a diminished probability of seeking treatment

To test these hypotheses, data from NESARC Wave 2 were analyzed in this chapter. Social network measures are found only in wave 2 of the NESARC. The second wave of NESARC involved re-interviews of Wave 1 respondents. The response rate of Wave 2 (based on the Wave 1 sample) was approximately 70%. Thus, the effective sample size of Wave 2 is $N = 34,653$ (Grant et al., 2007). Given that those with alcohol dependence are most in need of alcohol use disorder treatment, the sample for all hypotheses includes respondents who met diagnostic criteria for past-year DSM-IV alcohol dependence at Wave 2 ($N = 1,433$).

Multiple logistic regression is the primary analytic techniques for the study contained in this chapter. All analyses account for the complex design of NESARC using the strata, weight, and cluster variables (Grant et al., 2007). All analyses are completed using STATA V12 (StataCorp, 2011) Analyses will incorporate sociodemographics, resource availability and clinical characteristics as control variables in analyses examining the moderating role of social network ties on the relationship between alcohol consumption and treatment use. All hypotheses include the NESARC sample of respondents that met criteria for DSM-IV 12-month alcohol dependence.

Chapter 4: The effect of drinking goals at treatment entry on longitudinal alcohol use patterns among adults with alcohol dependence

Chapter 4 examines whether the goals an individual adopts concerning their drinking in early treatment influences their subsequent alcohol use following treatment completion. It is hypothesized that the adoption of abstinence as a drinking goal in early treatment will be explained by differences in sociodemographic and clinical characteristics of respondents. Additionally, it is hypothesized that adopting a drinking goal of abstinence in early treatment will reduce alcohol use following treatment completion, compared to individuals who do not adopt an abstinence goal on early treatment.

To test these hypotheses, data from the LTS are examined in a secondary analysis. The LTS is a longitudinal study of 364 adults who met DSM-IV criteria for alcohol dependence who were drawn from treatment and non-treatment sources. For this analysis, 93 LTS participants who were not in treatment were dropped, given this chapter's interest in abstinence as a drinking goal upon treatment entry. This left a final sample size of 271 alcohol-dependent adults who were in treatment for alcohol dependence at their baseline interview. Participants included in

study contained in this chapter were recruited from three sites: 1) a university-affiliated outpatient addiction treatment program (n=157), 2) a VA outpatient substance use treatment clinic (n=80), and 3) a drinking program which helped individuals to reduce, but not to stop, their drinking (n=34). Both the university affiliated outpatient program and the VA outpatient treatment clinic adhere to classic, abstinence-based treatment models.

Bivariate analyses examined who is most likely to endorse abstinence as a drinking goal at baseline. To understand how abstinence as a drinking goal at baseline influenced subsequent alcohol use, multilevel mixed-effects linear regression models are constructed to examine change in alcohol use patterns over a 2.5-year time period. All analyses are completed in STATA Version 12 (StataCorp, 2011).

Conclusions

The main purpose of this dissertation is to further knowledge regarding the characteristics of social network ties among individuals with alcohol use disorders, examine whether social network ties influence the decision to seek treatment for alcohol use, and whether the goals individuals adopt in early treatment influence alcohol use following treatment completion. The immediate goal is to disseminate results from these studies so they can be used to refine interventions centered on utilizing social network resources to facilitate treatment entry, and improve clinical practice for examining goal setting among individuals entering treatment for alcohol use. The long-term goal for this dissertation is to build a foundation of research that can directly lead to the improvement in quality of life for individuals experiencing alcohol use disorders. Through identifying social network characteristics of individuals with alcohol use disorders, strengths for improving the quality of life through social interaction can be

determined, and deficits in social network ties of persons with alcohol use disorders can be identified and improved directly through social work interventions.

Figure 1.1. Conceptual model for chapter 2

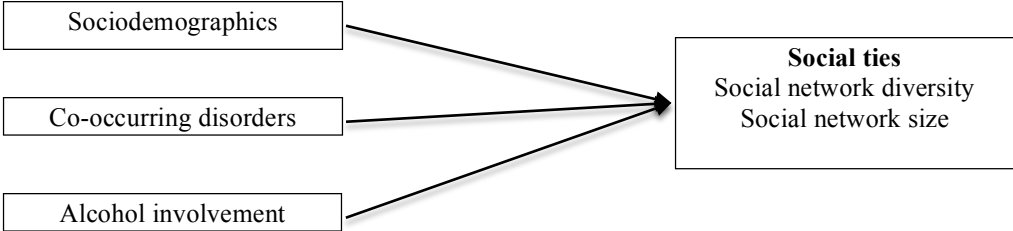


Figure 1.2. Conceptual model for chapter 3

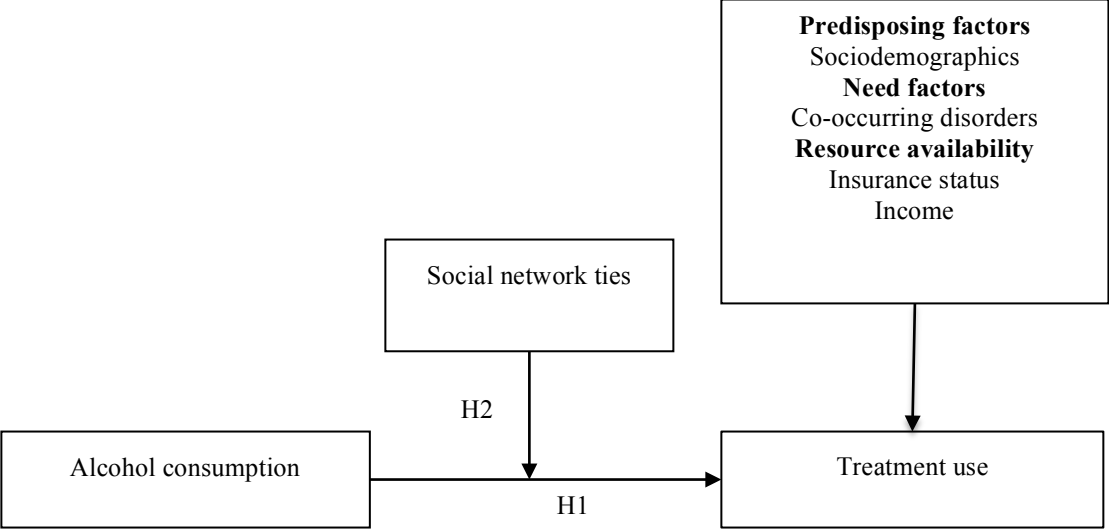
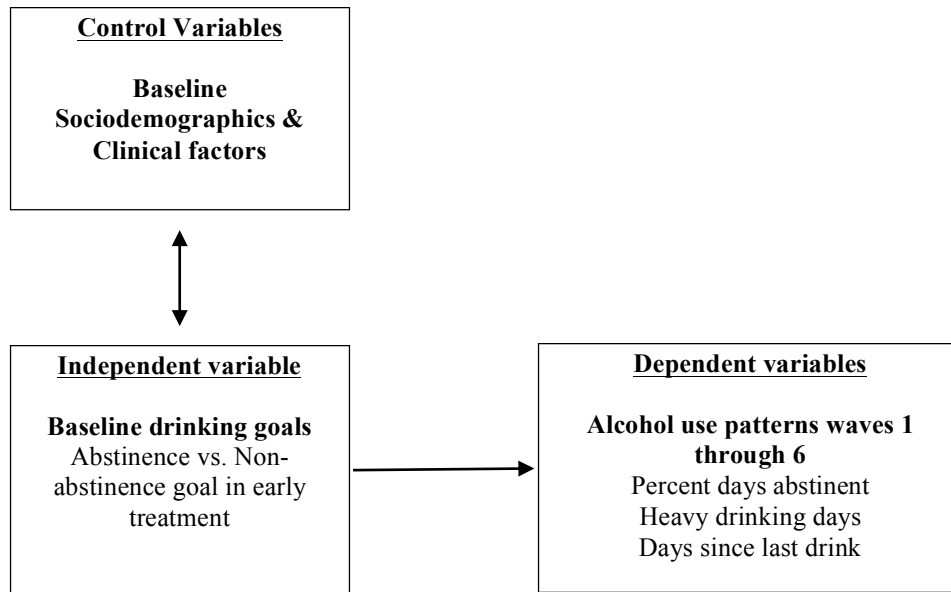


Figure 1.3. Conceptual model for chapter 4



References

- Adamson, S. J., Heather, N., Morton, V., & Raistrick, D. (2010). Initial Preference for Drinking Goal in the Treatment of Alcohol Problems: II. Treatment Outcomes. *Alcohol and Alcoholism, 45*(2), 136–142.
- Adamson, S. J., & Sellman, J. D. (2001). Drinking goal selection and treatment outcome in outpatients with mild-moderate alcohol dependence. *Drug and Alcohol Review, 20*(4), 351–359.
- American Psychiatric Association. (2000). *Diagnostic and Statistical Manual* (4th text-revised.). American Psychiatric Association.
- Azrin, N. H., Sisson, R. W., Meyers, R., & Godley, M. (1982). Alcoholism treatment by disulfiram and community reinforcement therapy. *Journal of Behavior Therapy and Experimental Psychiatry, 13*(2), 105–112.
- Bandura, A. (1986). The Explanatory and Predictive Scope of Self-Efficacy Theory. *Journal of Social and Clinical Psychology, 4*(3), 359–373.
- Barber, J. G., & Crisp, B. R. (1995). The “pressures to change” approach to working with the partners of heavy drinkers. *Addiction, 90*(2), 269–276.
- Berkman, L. F., & Syme, S. L. (1979). Social Networks, Host Resistance, and Mortality: A Nine-Year Follow-up Study of Alameda County Residents. *American Journal of Epidemiology, 109*(2), 186–204.
- Bond, J., Kaskutas, L. A., & Weisner, C. (2003). The persistent influence of social networks and alcoholics anonymous on abstinence. *Journal of Studies on Alcohol, 64*(4), 579–588.
- Booth, P. G., Dale, B., & Ansari, J. (1984). Problem drinkers’ goal choice and treatment outcome: A preliminary study. *Addictive Behaviors, 9*(4), 357–364.
- Brehm, S. S., & Brehm, J. W. (1981). *Psychological reactance*. New York: Academic Press.
- Brissette, I., Cohen, S., & Seeman, T. E. (2000). Measuring social integration and social networks. In *Social Support Measurement and Intervention: A Guide for Health and Social Scientists*. (pp. 53–85). New York, NY, US: Oxford University Press.
- Burk, W. J., van der Vorst, H., Kerr, M., & Stattin, H. (2012). Alcohol use and friendship dynamics: selection and socialization in early-, middle-, and late-adolescent peer networks. *Journal of studies on alcohol and drugs, 73*(1), 89–98.
- Cacioppo, J. T., Ernst, J. M., Burleson, M. H., McClintock, M. K., Malarkey, W. B., Hawkley, L. C., ... Berntson, G. G. (2000). Lonely traits and concomitant physiological processes: the MacArthur social neuroscience studies. *International Journal of Psychophysiology, 35*(2–3), 143–154.
- Cacioppo, J. T., Hawkley, L. C., & Berntson, G. G. (2003). The Anatomy of Loneliness. *Current Directions in Psychological Science, 12*(3), 71–74.
- Cacioppo, J. T., Hawkley, L. C., Crawford, L. E., Ernst, J. M., Burleson, M. H., Kowalewski, R. B., ... Berntson, G. G. (2002). Loneliness and Health: Potential Mechanisms. *Psychosomatic Medicine, 64*(3), 407–417.
- Caplan, G. (1974). *Support systems and community mental health: lectures on concept development*. Behavioral Publications.
- Cohen, E., Feinn, R., Arias, A., & Kranzler, H. R. (2007). Alcohol treatment utilization: Findings from the National Epidemiologic Survey on Alcohol and Related Conditions. *Drug and Alcohol Dependence, 86*(2–3), 214–221.

- Cohen, S, Doyle, W. J., Skoner, D. P., Rabin, B. S., & Gwaltney, J. M. (1997). Social ties and susceptibility to the common cold. *Journal of the American Medical Association*, 277(24), 1940–1944.
- Cohen, Sheldon. (2004). Social Relationships and Health. *American Psychologist*, 59(8), 676–684.
- Cohen, Sheldon, & Janicki-Deverts, D. (2009). Can We Improve Our Physical Health by Altering Our Social Networks? *Perspectives on Psychological Science*, 4(4), 375–378.
- Conner, M., & Heywood-everett, S. (1998). Addressing mental health problems with the theory of planned behaviour. *Psychology, Health & Medicine*, 3(1), 87–95.
- Cox, W. M., Rosenberg, H., Hodgins, C. H. A., Macartney, J. I., & Maurer, K. A. (2004). United Kingdom and United States Healthcare Providers' Recommendations of Abstinence Versus Controlled Drinking. *Alcohol and Alcoholism*, 39(2), 130–134.
- Dawson, D. A., Goldstein, R. B., Moss, H. B., Li, T.-K., & Grant, B. F. (2010). Gender differences in the relationship of internalizing and externalizing psychopathology to alcohol dependence: Likelihood, expression and course. *Drug and Alcohol Dependence*, 112(1–2), 9–17.
- Deci, E. L., & Ryan, R. M. (1985). *Intrinsic Motivation and Self-Determination in Human Behavior*. Springer.
- DeJong, W., Schneider, S. K., Towvim, L. G., Murphy, M. J., Doerr, E. E., Simonsen, N. R., ... Scribner, R. A. (2006). A Multisite Randomized Trial of Social Norms Marketing Campaigns to Reduce College Student Drinking. *Journal of Studies on Alcohol and Drugs*, 67(6), 868.
- DiClemente, C. C. (2007). Mechanisms, Determinants and Processes of Change in the Modification of Drinking Behavior. *Alcoholism: Clinical and Experimental Research*, 31(s3), 13s–20s.
- Dobson, A. J. (2002). *An introduction to generalized linear models*. CRC Press.
- Drake, R. E., Mercer-McFadden, C., Mueser, K. T., McHugo, G. J., & Bond, G. R. (1998). Review of integrated mental health and substance abuse treatment for patients with dual disorders. *Schizophrenia Bulletin*, 24(4), 589–608.
- Favazza, A. R., & Thompson, J. J. (1984). Social Networks of Alcoholics: Some Early Findings. *Alcoholism: Clinical and Experimental Research*, 8(1), 9–15.
- Garrett, J., Landau, J., Shea, R., Stanton, M. D., Baciewicz, G., & Brinkman-Sull, D. (1998). The ARISE Intervention: Using Family and Network Links to Engage Addicted Persons in Treatment. *Journal of Substance Abuse Treatment*, 15(4), 333–343.
- Gordon, A. J., & Zrull, M. (1991). Social networks and recovery: One year after inpatient treatment. *Journal of Substance Abuse Treatment*, 8(3), 143–152.
- Gourash, N. (1978). Help-seeking: a review of the literature. *American journal of community psychology*, 6(5), 413–423.
- Grant, B. F., Dawson, D. A., Stinson, F. S., Chou, S. P., Dufour, M. C., & Pickering, R. P. (2004). The 12-month prevalence and trends in DSM-IV alcohol abuse and dependence: United States, 1991–1992 and 2001–2002. *Drug and Alcohol Dependence*, 74(3), 223–234.
- Grant, B.F., Kaplan, K., & Stinson, F.S. (2007). *Source and Accuracy Statement: Wave 2 National Epidemiologic Survey on Alcohol and Related Conditions*. Bethesda, M.D.: National Institute of Alcoholism and Alcohol Abuse.

- Grant, B.F., Moore, T.C., Shepard, J., & Kaplan, K. (2003). *Source and Accuracy Statement: Wave I National Epidemiologic Survey on Alcohol and Related Conditions (NESARC)*. Bethesda, M.D.: National Institute of Alcoholism and Alcohol Abuse.
- Groh, D., Jason, L. A., Ferrari, J., & Halpert, J. (2011). A longitudinal investigation of the predictability of the three-factor model of the Important People Inventory. *The American Journal of Drug and Alcohol Abuse*, 37(4), 259–263.
- Hamilton, L. C. (2008). *Statistics with Stata: Updated for Version 10*. Cengage Learning.
- Harwood, H. J., Fountain, D., & Livermore, G. (1998). Economic Costs of Alcohol Abuse and Alcoholism. In *Recent Developments in Alcoholism* (Vol. 14, pp. 307–330). Boston: Kluwer Academic Publishers.
- Hasin, D. S., Stinson, F. S., Ogburn, E., & Grant, B. F. (2007). Prevalence, Correlates, Disability, and Comorbidity of DSM-IV Alcohol Abuse and Dependence in the United States: Results From the National Epidemiologic Survey on Alcohol and Related Conditions. *Arch Gen Psychiatry*, 64(7), 830–842.
- Heather, N., Adamson, S. J., Raistrick, D., & Slegg, G. P. (2010). Initial Preference for Drinking Goal in the Treatment of Alcohol Problems: I. Baseline Differences Between Abstinence and Non-Abstinence Groups. *Alcohol and Alcoholism*, 45(2), 128–135.
- Heinrich, L. M., & Gullone, E. (2006). The clinical significance of loneliness: A literature review. *Clinical Psychology Review*, 26(6), 695–718.
- Helgeson, V.S., Cohen, S., & Fritz, H.I. (1998). Social ties and cancer. In *Psycho-Oncology* (pp. 99–109). New York: Oxford Press.
- Holder, H. D., Cisler, R. A., Longabaugh, R., Stout, R. L., Treno, A. J., & Zweben, A. (2000). Alcoholism treatment and medical care costs from Project MATCH. *Addiction*, 95(7), 999–1013.
- House, J. S., Landis, K. R., & Umberson, D. (1988). Social relationships and health. *Science*, 241(4865), 540–545.
- Humphreys, K., & Noke, J. M. (1997). The Influence of Posttreatment Mutual Help Group Participation on the Friendship Networks of Substance Abuse Patients. *American Journal of Community Psychology*, 25(1), 1–16.
- Knecht, A. B., Burk, W. J., Weesie, J., & Steglich, C. (2010). Friendship and Alcohol Use in Early Adolescence: A Multilevel Social Network Approach. *Journal of Research on Adolescence*, 21(2), 475–487.
- Kopelman, M. D., Thomson, A. D., Guerrini, I., & Marshall, E. J. (2009). The Korsakoff Syndrome: Clinical Aspects, Psychology and Treatment. *Alcohol and Alcoholism*, 44(2), 148–154.
- Longabaugh, R., Donovan, D. M., Karno, M. P., McCrady, B. S., Morgenstern, J., & Tonigan, J. S. (2006). Active Ingredients: How and Why Evidence-Based Alcohol Behavioral Treatment Interventions Work. *Alcoholism: Clinical and Experimental Research*, 29(2), 235–247.
- Maisto, S. A., Pollock, N. K., Cornelius, J. R., Lynch, K. G., & Martin, C. S. (2003). Alcohol relapse as a function of relapse definition in a clinical sample of adolescents. *Addictive Behaviors*, 28(3), 449–459.
- Mattern, J. L., & Neighbors, C. (2004). Social Norms Campaigns: Examining the Relationship between Changes in Perceived Norms and Changes in Drinking Levels. *Journal of Studies on Alcohol and Drugs*, 65(4), 489.

- Maulik, P. K., Eaton, W. W., & Bradshaw, C. P. (2009). The Role of Social Network and Support in Mental Health Service Use: Findings From the Baltimore ECA Study. *Psychiatric Services, 60*(9), 1222–1229.
- McCullagh, P., & Nelder, J. A. (1989). *Generalized Linear Models, Second Edition*. CRC Press.
- Meyers, R. J., Dominguez, T. P., & Smith, J. E. (1996). Community reinforcement training with concerned others. In *Sourcebook of Psychological Treatment Manuals for Adult Disorders*. (pp. 257–294). New York, NY, US: Plenum Press.
- Miller, W.R., & Tonigan, J.S. (1995). *The Drinker Inventory of Consequences (DrInC): An instrument for assessing adverse consequences of alcohol abuse. Project MATCH Monograph Series, Vol. 4. DHHS Publication No. 95-3911*. Rockville MD: NIAAA.
- Moos, R. H., Fenn, C. B., Billings, A. G., & Moos, B. S. (1988). Assessing life stressors and social resources: Applications to alcoholic patients. *Journal of Substance Abuse, 1*(2), 135–152.
- Moos, R. H., & Moos, B. S. (2006). Rates and predictors of relapse after natural and treated remission from alcohol use disorders. *Addiction, 101*(2), 212–222.
- Moyer, A., Finney, J. W., Swearingen, C. E., & Vergun, P. (2002). Brief interventions for alcohol problems: a meta-analytic review of controlled investigations in treatment-seeking and non-treatment-seeking populations. *Addiction, 97*(3), 279–292.
- Pachman, J. S., Foy, D. W., & Van Erd, M. (1978). Goal choice of alcoholics: a comparison of those who choose total abstinence vs. those who choose responsible, controlled drinking. *Journal of Clinical Psychology, 34*(3), 781–783.
- Page, R. M., & Cole, G. E. (1991). Loneliness and alcoholism risk in late adolescence: A comparative study of adults and adolescents. *Adolescence, 26*(104), 925–930.
- Perkins, H. W., & Craig, D. W. (2006). A Successful Social Norms Campaign to Reduce Alcohol Misuse Among College Student-Athletes. *Journal of Studies on Alcohol and Drugs, 67*(6), 880.
- Perry, B. L., & Pescosolido, B. A. (2010). Functional specificity in discussion networks: The influence of general and problem-specific networks on health outcomes. *Social Networks, 32*(4), 345–357.
- Pescosolido, B. A., Gardner, C. B., & Lubell, K. M. (1998). How people get into mental health services: Stories of choice, coercion and “muddling through” from “first-timers.” *Social Science & Medicine, 46*(2), 275–286.
- Pressman, S. D., Cohen, S., Miller, G. E., Barkin, A., Rabin, B. S., & Treanor, J. J. (2005). Loneliness, Social Network Size, and Immune Response to Influenza Vaccination in College Freshmen. *Health Psychology, 24*(3), 297–306.
- Rehm, J., Mathers, C., Popova, S., Thavorncharoensap, M., Teerawattananon, Y., & Patra, J. (2009). Global burden of disease and injury and economic cost attributable to alcohol use and alcohol-use disorders. *The Lancet, 373*(9682), 2223–2233. doi:10.1016/S0140-6736(09)60746-7
- Robinson, E. A. R., Krentzman, A. R., Webb, J. R., & Brower, K. J. (2011). Six-month changes in spirituality and religiousness in alcoholics predict drinking outcomes at nine months. *Journal of studies on alcohol and drugs, 72*(4), 660–668.
- Rook, K. S. (1984). Research on social support, loneliness, and social isolation: Toward an integration. *Review of Personality & Social Psychology, 5*, 239–264.

- Room, R., Greenfield, T. K., & Weisner, C. (1991). People Who Might Have Liked You to Drink Less: Changing Responses to Drinking by U.S. Family Members and Friends, 1979-1990. *Contemporary Drug Problems*, 18, 573.
- Rosenberg, H., & Davis, L.-A. (1994). Acceptance of moderate drinking by alcohol treatment services in the United States. *Journal of Studies on Alcohol*, 55(2), 167–172.
- Rubinstein, R. L., Lubben, J. E., & Mintzer, J. E. (1994). Social Isolation and Social Support: An Applied Perspective. *Journal of Applied Gerontology*, 13(1), 58–72.
- Sadava, S. W., & Pak, A. W. (1994). Problem drinking and close relationships during the third decade of life. *Psychology of Addictive Behaviors*, 8(4), 251–258.
- Smith, D. C., Cleeland, L., & Dennis, M. L. (2010). Reasons for quitting among emerging adults and adolescents in substance-use-disorder treatment. *Journal of Studies on Alcohol and Drugs*, 71(3), 400–409.
- Sobell, L.C., & Sobell, M.B. (1992). Timeline follow back: A technique for assessing self-reported alcohol consumption. In Raye Z. Litten & John P. Allen (Eds.), *Measuring Alcohol Consumption: Psychosocial and Biochemical Methods*. Totowa: Humana Press.
- Sorkin, D., Rook, K. S., & Lu, J. L. (2002). Loneliness, lack of emotional support, lack of companionship, and the likelihood of having a heart condition in an elderly sample. *Annals of Behavioral Medicine*, 24(4), 290–298.
- StataCorp. (2011). *Stata Statistical Software: Release 12*. College Station, TX: StataCorp LP.
- Tracy, E. M., & Biegel, D. E. (2006). Personal Social Networks and Dual Disorders: A Literature Review and Implications for Practice and Future Research. *Journal of Dual Diagnosis*, 2(2), 59–88.
- U.S. Department of Health and Human Services. (2010). *Healthy People 2020*. Washington, DC 2010.
- U.S. Department of Health and Human Services. (). *The contributions of behavioral and social sciences research to improving health of the nation: A prospectus for the future*. Washington, DC 2010.
- Weisner, C. (1993). Toward an Alcohol Treatment Entry Model: A Comparison of Problem Drinkers in the General Population and in Treatment. *Alcoholism: Clinical and Experimental Research*, 17(4), 746–752.
- Westermeyer, J., Thuras, P., & Waaijer, A. (2004). Size and Complexity of Social Networks among Substance Abusers: Childhood and Current Correlates. *The American Journal on Addictions*, 13(4), 372–380.
- Whitford, J. L., Widner, S. C., Mellick, D., & Elkins, R. L. (2009). Self-Report of Drinking Compared to Objective Markers of Alcohol Consumption. *The American Journal of Drug and Alcohol Abuse*, 35(2), 55–58.
- Zarkin, G. A., Bray, J. W., Aldridge, A., Mills, M., Cisler, R. A., Couper, D., ... O'Malley, S. (2010). The Effect of Alcohol Treatment on Social Costs of Alcohol Dependence. *Medical Care*, 48(5), 396–401.

Chapter 2: Alcohol use disorders and diminished social ties: Findings from the NESARC

Abstract

Background: In an effort to determine whether test the hypothesis that social network ties of individuals with alcohol use disorders (AUDs) are smaller than those with no AUDs, social network characteristics are compared among those with an AUD diagnosis and those with no diagnosed AUD among respondents from the National Epidemiologic Survey on Alcohol Related Conditions (NESARC).

Methods: 34,653 respondents from wave 2 of the NESARC were assessed for the presence of lifetime alcohol dependence or lifetime alcohol abuse, social network ties, sociodemographics and clinical characteristics. Bivariate comparisons examined correlates of social network ties. Multivariate regression analyses were used to examine alcohol abuse and dependence as predictors of social network ties while adjusting for sociodemographic and other clinical variables.

Results: Analyses showed that social network ties tend to be smaller for those with lifetime alcohol abuse and alcohol dependence. However, individuals with lifetime alcohol dependence reported social network ties composed of students and co-workers at larger rates than those with lifetime alcohol abuse and those with no lifetime AUD. Furthermore, those with lifetime alcohol abuse reported social network ties composed of spouses/partners, friends, students/teachers, co-workers, and others groups, at larger rates than those with no lifetime AUD.

Conclusion: Interventions that promote social influence to reduce alcohol use may achieve effectiveness through targeting specific groups in an individual's social networks that are larger in size and more prevalent among individuals with AUDs. Also, efforts to re-integrate those with AUDs into the broader community may be best served by targeting the specific groups in a social network that are smaller in size among those with an AUD.

Introduction

There is considerable disagreement concerning social network ties of individuals with an alcohol use disorder (AUD). While some argue that social network ties, or multiple social ties to friends, family, co-workers and community, of individuals with AUD are similar to individuals with no AUD (McCrary, 2004), there is other evidence to suggest that 1) Social network ties of individuals with high levels of alcohol involvement are smaller and less diverse than individuals with low levels of alcohol involvement (Cacioppo et al., 2002, 2002; Page & Cole, 1991; Sadava & Pak, 1994), and 2) the social network ties of alcohol dependent individuals with high alcohol use severity are considerably smaller and less diverse compared to alcohol dependent individuals with lower alcohol use severity (Westermeyer & Neider, 1988; Westermeyer, Thuras, & Waaijer, 2004). In an effort to test the hypothesis that the social network ties of individuals with AUDs are smaller than individuals with no AUDs, in this chapter, I compare social network characteristics among individuals with an AUD diagnosis of dependence, abuse and individuals with no diagnosed AUD among respondents from a nationally representative sample.

Social network ties and alcohol use disorders

While it is uncertain whether the social network ties of individuals with an AUD are different than individuals without an AUD, there is a significant amount of evidence to suggest

that the degree of alcohol involvement is a significant predictor of social network ties (Cacioppo et al., 2000, 2002). However, it is important to note that these results are drawn from non-clinical samples and have produced inconsistent findings (Cacioppo et al., 2002, 2002; Page & Cole, 1991; Sadava & Pak, 1994). From clinical samples of individuals with a diagnosed AUD, it is known that alcohol consumption and risk for alcohol abuse is higher among individuals who report fewer social ties (Heinrich & Gullone, 2006; Pressman et al., 2005; Sorkin et al., 2002).

Why examine social network ties?

There is a substantial body of research that suggests health status plays a critical role in an individual's social network ties. The overwhelming conclusion from this work is that individuals who experience better physical health have social network ties that are larger and more diverse. Perhaps the most striking conclusion from research on the effect of social ties has shown, in several longitudinal samples, that individuals with fewer social ties experience higher mortality rates (Berkman & Syme, 1979; House, Robbins, & Metzner, 1982).

Common groups composing an individual's social ties include family, friends, co-workers and community groups. Social network size and social network diversity are two distinct measures of social network ties. Social network size is defined as the number of persons (across all types of social relationships) for which individuals report frequent (varying between 2 weeks and 1 month) social interaction. Social network diversity measures number of social roles (types of social relationships) for which individuals report some level of participation between 2 weeks and 1 month (Brissette, Cohen, & Seeman, 2000).

Social network size has been utilized in a number of studies examining health outcomes including exposure to stress (Haines & Hurlbert, 1992), the general health of elderly populations (Gallo, 1983), and neuroendocrine activity (Seeman, Berkman, Blazer, & Rowe, 1994). Yet,

social network size has been criticized as a relatively weak predictor of health, with social network diversity as the preferred measurement to explore the relationships between health and social network ties (Cohen & Wills, 1985; Uchino, Cacioppo, & Kiecolt-Glaser, 1996). While disagreement persists concerning which measure is a better indicator of health, both social network size and social network diversity have both been shown to predict health outcomes, suggesting that both measures may make a valid contribution to understanding how social network ties are related to measures of both health and mental health. While the findings examining social network ties and health suggest that larger, more diverse networks are beneficial for health, it is not clear from the existing research on social network ties and alcohol use, what exactly, the social networks of individuals with AUDs look like, and whether increasing the size and diversity of the social networks of individuals with AUDs is useful in improving health.

Social network size

Social network size, as a construct, is a measure available in many social network instruments, including two often-used measures: The Social Network Inventory (Cohen, Doyle, Skoner, Rabin, & Gwaltney, 1997) and The Important People Inventory (Groh, Olson, Jason, Davis, & Ferrari, 2007). Both measures stem from applications concerning social network therapy among the seriously mentally ill (Speck, 1967). This approach to social network ties placed the focus of therapy on the individual's perception of the structure of their social network, examining the individual's important network members and the frequencies of contact with these members. Historically, social network analysis crosses many disciplines from anthropology (Mitchell, 1974), psychology (Price & Politser, 1980), to most notably, sociology, where social network size was incorporated in Durkheim's initial studies on suicide (Durkheim, 1997).

Social network diversity

Research measuring social network ties in this fashion demonstrates that increased social network diversity is related to lessened psychological distress (Thoits, 1983), as well as improved health status, both objective and perceived (Moen, Dempster-McClain, & Williams, 1992). Additional research in social network diversity has shown that in terms of health, individuals with greater social network diversity also report lowered rates of alcohol use, reduced smoking, better diet, more sleep, and higher rates of physical exercise (Cohen et al., 1997; Cohen & Williamson, 1991).

Increased social network diversity has also been associated with better mental health outcomes, including lower levels of stress (Cassel, 1976), lowered levels of anxiety (Bolger & Eckenrode, 1991), reduced depressive symptomatology among mothers of children with mental illness (Hong, Seltzer, & Krauss, 2001), increased social support (Taylor, Falke, Shoptaw, & Lichtman, 1986), and increased exposure to health promoting behaviors (Antonovsky, 1979; Umberson, 1987). Finally, research on social network diversity shows that individuals suffering from a diagnosed mental illness, including major depression and anxiety disorders are more likely to have smaller social network diversity than individuals who experience no mental illness (Tracy & Biegel, 2006).

Current study

Drawing from the literature surrounding social network ties and health, four hypotheses have been generated to examine the social network ties of individuals with AUDs. Through using an established measure of social networks, I sought to test the following hypotheses: (1) What differences are there in the social networks in terms of their size and diversity among individuals with alcohol abuse, alcohol dependence, and those from the general sample? (2)

Controlling for important social and clinical differences, do differences in social networks in terms of size and diversity still emerge between individuals with alcohol dependence, alcohol abuse, and the general population?

Methods

Sample

The secondary data used to examine these research questions comes from wave 2 of The National Epidemiologic Survey on Alcohol Related Conditions (NESARC). NESARC is a population-representative survey of United States adults aged 18 or older living in noninstitutionalized settings. Wave 2 NESARC data were collected between 2004 and 2005. Wave 2 of the NESARC surveyed 34,653 of wave 1 respondents (reflecting an 86.7% response rate) (Grant et al., 2004, 2005; Hasin et al., 2007). Wave 2 NESARC data were weighted to reflect survey design characteristics and to account for oversampling of certain groups. NESARC data are also weighted to be representative of the U.S. population on socioeconomic variables, based on the 2000 decennial census.

Measurement

Social network ties are the primary outcome variable for the current study. The Social Network Index (Cohen et al., 1997) from the NESARC was used to derive two different measures of social network ties for the current study (1) social network size and (2) social network diversity. Social network diversity referred to membership in different social groups (Cohen et al., 1997). Social network diversity was assessed in terms of the number of social groups an individual has other group members they interact with (family, work, community, etc.) Social network size (SNS) was assessed in terms of the number of members in an individual's

social network across all the groups he/she belongs to (Brissette et al., 2000). Both measures were constructed from the same survey items in the NESARC but constructed in different ways.

Social Network Index. In this study, the individual items from the Social Network Index and response options were organized consistent with prior work on social networks (Brissette et al., 2000; Cohen et al., 1997). The Social Network Index consists of social network ties measurement across 11 groups. Groups of the Social Network Index are outlined in Table 2.1. Among each of the 11 social network groups, individuals who responded to the Social Network Index questions in the affirmative (yes), or with a number greater than zero were considered to possess membership in a social network. To compute a score for social network size, a count variable was created counting the sum total of members in a social network across all 11 groups (range 0 – 233). To compute a score for social network diversity, a count variable was created counting the number of groups an individual had at least one member in, across all 11 groups (range 0 – 11).

Alcohol use disorders. Individuals in the NESARC completed the Alcohol Use Disorder and Associated Disabilities Interview Schedule - DSM-IV version (AUDADIS-IV) (Grant et al., 2004). This structured interview, designed for lay interviewers was developed to measure substance use and mental health in large-scale surveys (Grant et al., 2004, Grant et al., 2005). Questions in the AUDADIS-IV covered DSM-IV criteria for alcohol abuse and dependence. Consistent with DSM-IV, lifetime diagnoses of alcohol abuse required 1 or more of 4 abuse criteria during any previous 12-month period in an individual's life. Lifetime alcohol dependence diagnoses required 3 or more of the 7 dependence criteria during any previous 12-month period in an individual's life.

The reliability of AUDADIS-IV alcohol diagnoses is documented in both clinical and

population samples (Grant, Moore, Shepard & Kaplan, 2003), with test-retest reliability in acceptable range ($k = .67-.70$). Additional measures of the validity of the AUDADIS-IV, including convergent, discriminant and construct validity have also been documented elsewhere as acceptable (Hasin, Paykin, Endicott, & Grant, 1999; Hasin, Grant, & Endicott, 1990; Hasin, Van Rossem, McCloud, & Endicott, 1997). From the AUDADIS-IV, 3 groups were formed: (1) Individuals with no lifetime diagnosis of alcohol abuse or dependence, $N = 23,350$ (2) individuals with a lifetime diagnosis of alcohol abuse, $N = 6,389$ (3) individuals with a lifetime diagnosis of alcohol dependence, with or without abuse, $N = 4,914$.

Sociodemographics. Individuals were assessed for several sociodemographic characteristics including race/ethnicity group, including White (non-Hispanic), Black, American Indian/Alaskan Native, Asian/Pacific Islander, and Hispanic; gender; marital status, including married/cohabitating, separated/divorced/widowed and never married; personal annual income (in annual dollars); age (in years); and employment status, including employed and unemployed.

Lifetime drug use disorders. Individuals who were included as having a drug use disorder include those respondents who met DSM-IV lifetime criteria for any non-nicotine drug use disorder, including abuse or dependence. The specific substances assessed were: sedatives, tranquilizers, opioids, amphetamine, cannabis, hallucinogens, cocaine, inhalants, heroin, or “other” drugs.

Lifetime mental health disorders. Two mental health disorders were examined in this study (1) a binary variable examining lifetime history of an anxiety disorder (social phobia, panic disorder with or without agoraphobia, and generalized anxiety disorder) and (2) a binary variable examining lifetime history of major depression. These 2 disorders were selected for the study given their higher levels of prevalence in the U.S. population compared to other mental health

disorders (Hasin et al, 2007).

Analyses

Analyses were computed using weighted population analyses in STATA Version 12 (StataCorp, 2011). This system implements a Taylor series linearization to adjust for the complex survey design. Chi-square tests were used to make bivariate comparisons between each categorical variable and multinomial outcomes. ANOVA was used to make bivariate comparisons between each categorical variable and continuous outcomes. Multivariate logistic regression analyses were used to examine alcohol abuse and dependence as predictors of social network size and social network diversity while adjusting for sociodemographic and other clinical variables.

Results

When examining AUDs in the NESARC, 67.5% of individuals reported no lifetime AUD, 18.3% of individuals reported a lifetime AUD of abuse, and 14.2% of individuals reported a lifetime AUD of dependence (see Table 2.2). Chi-square analyses comparing sociodemographics and clinical characteristics between individuals with no lifetime AUD, individuals with lifetime alcohol abuse, and individuals with lifetime alcohol dependence, showed that individuals with abuse and dependence were more likely to be White, male, higher income, middle aged, and have co-occurring mental health (depression or anxiety) or drug use disorder. Additionally, compared to individuals with lifetime alcohol abuse, individuals with lifetime alcohol dependence were more likely to be a racial/ethnic minority, not married, lower income, younger in age, unemployed, and have co-occurring mental health (depression or anxiety) or drug use disorder.

Social network size

Across nearly all social network groups, a graded relationship emerged where individuals with alcohol dependence possessed the smallest social networks in size. The average social network size of individuals with no history of alcohol abuse was 32.52 persons. The average social network size of individuals with alcohol abuse was 31.34 persons. The average social network size of individuals with alcohol dependence was 28.87 persons. These differences were significant, $F(2,64) = 4.03$, $p < .05$, with post-hoc pair-wise comparisons showing that individuals with alcohol dependence had significantly smaller social networks than individuals with no history of AUD. Comparisons between individuals with alcohol abuse vs. individuals with alcohol dependence, and individuals with alcohol abuse vs. individuals with no history of AUD were non-significant (see Table 2.3). While this graded relationship held constant for many social network groups among individuals with no history of AUD, abuse and dependence, there were a few notable exceptions in the pair-wise comparisons of social network groups.

First, individuals with alcohol abuse were the group most likely to have a spouse/partner in their social network (68.1%), followed by individuals with no history of AUD (64.4%) and individuals with alcohol dependence (55.4%), $F(2,64) = 71.93$, $p < .01$. Second, individuals with alcohol dependence had the largest social network group of students/teachers (.70), followed by individuals with alcohol abuse (.46). Individuals with no history of AUD had the smallest student social network (.44), $F(2,64) = 9.87$, $p < .01$. Third, individuals with alcohol dependence had the largest social network group of co-workers (2.49), followed by individuals with alcohol abuse (2.24). Individuals with no history of AUD had the smallest co-worker social network (1.91), $F(2,64) = 88.82$, $p < .01$. Finally, individuals with alcohol abuse had the largest social network of “other” groups (2.48), followed by individuals with alcohol dependence (1.96). Individuals with

no history of AUD had the smallest social network comprised of “other” groups (1.81), $F(2,64) = 17.23$, $p < .01$.

Social network diversity

When examining social network diversity, a different pattern emerges, suggesting that individuals who experience alcohol abuse possess social networks that are more diverse than individuals with alcohol dependence and those with no history of AUD. Social networks of individuals with alcohol abuse were composed of an average of 5.01 social groups. The social networks of individuals with no history of AUD were composed of an average of 4.89 groups. The social networks of individuals with alcohol dependence were composed of an average of 4.72 groups. These differences were significant, $F(2, 34,802) = 22.13$, $p < .01$, with post-hoc pair-wise comparisons showing that individuals with alcohol dependence had significantly smaller social networks than individuals with alcohol abuse and individuals with no history of AUD. Additionally, comparisons between individuals with alcohol abuse vs. individuals with no history of AUD were also significant at $p < .05$ (see Table 2.4).

While the overall mean number of social groups presented above shows that individuals with alcohol abuse have more diverse networks, an examination of percentages within each diagnostic group shows a great amount of variability in social network diversity within each group.

Individuals with no history of AUD were most likely to report a social network including their children, with 50.6%; whereas 44.3% of individuals with alcohol abuse and 29.6% of individuals with alcohol dependence reported a social network including their children, $F(2,64) = 217.17$, $p < .01$. Additionally, individuals with no history of alcohol dependence were most likely to report a social network including relatives, with 93.1%, whereas 91.4% of individuals

with alcohol abuse and 90.6% of individuals with alcohol dependence reported a social network including their relatives $F(2,64) = 6.17, p < .01$. Furthermore, individuals with alcohol dependence were most likely to report a social network including their friends, with 90.8%, whereas 90.2% of individuals with alcohol abuse and 89.3% of individuals with no history of AUD reported a social network including their friends $F(2,64) = 4.11, p < .05$. Similarly, individuals with alcohol dependence were most likely to report a social network including students/teachers, with 7.6%, whereas only 4.9% of individuals with alcohol abuse and 6% of individuals with no history of AUD reported a social network including students/teachers $F(2,64) = 9.87, p < .01$. Last, individuals with alcohol dependence were most likely to report a social network including co-workers, with 48.9%, whereas, 43.8% of individuals with abuse and 37.8% of individuals with no history of AUD reported a social network including co-workers $F(2,64) = 88.82, p < .05$.

Multivariate model

A series of multivariate regression models were used to further examine predictors of social network size and social network diversity. To examine predictors of social network size, a Poisson model was constructed to examine social network size differences between individuals with no history of AUD, individuals with alcohol abuse and individuals with alcohol dependence as main independent variables of interest. Potentially confounding variables in social network size, including race/ethnicity, gender, marital status, income, age, employment status, lifetime drug use disorder, lifetime major depressive disorder and lifetime anxiety disorder were also entered into the model. Significant associations, including standardized beta values and confidence intervals are found in Table 2.5. For purposes of brevity, values for the control variables are not reported and the reader is referred to the table for examination.

The multivariate model showed that when controlling for sociodemographic and clinical variables, individuals with alcohol abuse had smaller social networks than individuals with no history of AUD ($B = -.09, p < .01$).

This coefficient showing that individuals with alcohol abuse had smaller social networks than individuals with no history of AUD is interpreted as follows: On average, individuals with alcohol abuse possess .09 fewer persons in their social networks than individuals with no history of AUD.

Additionally, individuals with alcohol dependence had smaller social networks than individuals with no history of AUD ($B = -.08, p < .01$). Post-hoc comparisons between individuals with alcohol abuse and individuals with alcohol dependence showed no significant difference in social network size after controlling for sociodemographic and clinical characteristics.

To examine predictors of social network diversity, a linear regression model was constructed to examine differences in social network diversity between individuals with no history of AUD, individuals with alcohol abuse and individuals with alcohol dependence as main independent variables of interest. Confounding variables in social network diversity, including race/ethnicity, gender, marital status, income, age, employment status, lifetime drug use disorder, lifetime major depressive disorder and lifetime anxiety disorder were also entered into the model. Significant associations, including standardized beta values and confidence intervals are found in Table 5. Similar to the presentation of social network size results, values for the control variables are not reported and the reader is referred to the table to examination.

The multivariate model showed that when controlling for sociodemographic and clinical variables, individuals with alcohol abuse had smaller social networks than individuals with no

history of AUD ($B = -.09, p < .01$). Additionally, individuals with alcohol dependence had smaller social networks than individuals with no history of AUD ($B = -.08, p < .01$). Post-hoc comparisons between individuals with alcohol abuse and individuals with alcohol dependence showed no significant difference in social network size after controlling for sociodemographic and clinical characteristics.

Discussion

This study examined social network ties of individuals from a population-representative sample from two different measures of social ties; social network size and social network diversity. The study placed specific emphasis on examining differences in social network ties between individuals with an alcohol use disorder (AUD) compared to individuals with no AUD. To examine these differences, we compared three groups of individuals; individuals with no lifetime AUD, individuals with a lifetime diagnosis of alcohol abuse, and individuals with a lifetime diagnosis of alcohol dependence. To our knowledge, this is the first study to describe a nationally representative, community-based sample of individuals with a lifetime AUD with a focus on rates and correlates of social ties.

Overall, this study found that social network ties tend to be smaller for individuals with lifetime alcohol abuse and alcohol dependence, compared to individuals with no lifetime AUD. Controlling for differences known to influence social network size and social network diversity, both social network size and social network diversity are smaller among individuals with lifetime alcohol abuse and lifetime alcohol dependence, compared to individuals with no lifetime AUD. However, the results also show that there are no significant differences between those with lifetime alcohol abuse and lifetime alcohol dependence in terms of social network size and social network diversity.

Bivariate results suggest that individuals with lifetime alcohol dependence tend to have smaller, less diverse social networks than individuals with lifetime alcohol abuse and lifetime alcohol dependence. While previous research has shown significant segments of individuals with an AUD having small social networks (McCrary, 2004), these results assist in establishing reliability in findings from clinical samples.

However, the findings that social ties are smaller and less diverse among individuals with an AUD are not uniform. We also observed considerable variance in the size and diversity of social networks comparing individuals with a lifetime AUD to individuals with no lifetime AUD. For example, individuals with lifetime alcohol dependence are more likely to belong to groups of students/teachers and co-workers, as well as have a higher number of students/teachers and co-workers in their network than individuals with lifetime alcohol abuse and those with no lifetime AUD. Furthermore, individuals with lifetime alcohol abuse are more likely to belong to groups of spouses/partners, friends, students/teachers, co-workers, and “other” groups, as well as have a higher number of spouses/partners, friends, students/teachers, co-workers, and “other” groups in their network than individuals with no lifetime AUD.

Future directions

The results presented here are descriptive in nature, but offer insight for several avenues concerning potential interventions in treating AUDs and further research. Interventions that harness social influence to reduce alcohol use may experience greater effectiveness through targeting groups in social network ties that are larger in size and more prevalent among individuals with AUDs. Interventions that attempt to reduce the social influence of alcohol abuse among college students has proven effective (DeJong et al., 2006; Mattern & Neighbors, 2004; Perkins & Craig, 2006), and there is corroborating research to suggest that targeting the

reduction of alcohol use in a social network of co-workers promotes abstinence among individuals who have sought treatment for AUDs (Gordon & Zrull, 1991).

Further, these findings may suggest that interventions intended to reduce the social influence of alcohol abuse among individuals with an AUD may be effective through targeting groups that are more prevalent in the social network ties of individuals with an AUD, including “other” groups, such as social clubs, recreational groups, commercial groups, and professional organizations. Also, efforts to re-integrate individuals with AUDs into the broader community may be best served by targeting the specific social ties in a social network that are smaller in size among individuals with an AUD. These groups include neighbors, religious groups and volunteer groups.

Limitations

While these findings suggest that in some domains, social network ties are larger in size and more diverse among individuals with AUD, these results cannot establish whether the effects of large, diverse social networks are positive for the treatment and management for AUDs, or negative. On the one hand, large and diverse social network ties can reduce stress, promote healthy behaviors, increase social support, and offer influence to seek treatment for health-related problems (Cassell, 1976; Umberson, 1987; Taylor, 2000; Pescosolido, 1991). However, there is additional evidence to suggest that larger and more diverse network ties of individuals with an AUD contain other individuals with alcohol use problems at much higher rates than the social networks ties of individuals with no AUD (Bullers, Cooper, & Russell, 2001; Mohr, Aversa, Kenny, Boca, & del Boca, 2001; Wenzel, Tucker, Golinelli, Green Jr., & Zhou, 2010). The NESARC does not measure alcohol use among social network ties, and further research is needed to examine whether social network ties of individuals with an AUD that are large and

diverse also contain a high presence of alcohol use, suggesting that these types of network ties may not be a positive influence in the treatment and management of AUDs.

Furthermore, the NESARC did not take into account temporal ordering of social network ties measures and AUDs, suggesting that the relationship between social network ties and AUDs is only a trend. Causal relationships cannot be determined in the NESARC. However, these results are consistent with a theoretical grounding in social network ties and health-related problems and similar to other social network findings.

Finally, while the results demonstrate that significant differences emerge between individuals with a lifetime diagnosis of alcohol dependence, alcohol abuse, and no lifetime history of alcohol abuse or alcohol dependence, it is likely that the large sample size of the NESARC detects these differences at levels that are relatively small in terms of clinical significance. While the social networks of individuals with an alcohol use disorder may be smaller, they may only be smaller by only one group (or even by only one less person). Whether these differences are meaningful, in a real-world sense requires additional examination of social networks among individuals with alcohol problems, as well as an examination of other factors related to the social networks of individuals, such as level of alcohol consumption.

Table 2.1. Social Network Index

1. Are you married, dating, or involved in a romantic relationship? (Yes/No)
 2. How many of your grown children do you see or talk to on the phone or Internet at least once every two weeks?
 3. Do you see or talk on the phone or Internet to any of you parents or people who raised you at least once every two weeks? (Yes/No)
 4. Do you see or talk on the phone or Internet to your spouse's/partner' parents or other people who raised your spouse/partner at least once every two weeks? (Yes/No)
 5. How many of your other relatives, not counting spouses, partners, children, parents or parents-in-law do you see or talk to on the phone or Internet at least once every two weeks?
 6. How many close friends do you see or talk to on the phone or Internet at least once every two weeks?
 7. How many fellow or teachers do you see or talk to on the phone or Internet at least once every two weeks?
 8. How many people do you work with that you see or talk to on the phone or Internet at least once every two weeks?
 9. How many of your neighbors do you visit or talk to at least once every two weeks?
 10. How many people involved in volunteer/community service do you see or talk to on the phone or Internet at least once every two weeks?
 11. Thinking about all other groups together, how many members of these other groups do you see or talk to on the phone or Internet at least once every two weeks?
-

Social network diversity scoring: If respondent is married, or responds with a number of one or greater for each of the following questions, participant is a member of the social network.

Social network size scoring: Count of the number of individuals a respondent reports within each of the following questions.

Source: Brisette et al 2000

Table 2.2. Sociodemographic and clinical characteristics

	Overall N = 34,803 % (SE)	No AUD N = 23,500 % (SE)	Alcohol Abuse N = 6,389 % (SE)	Alcohol Dependence N = 4,914 % (SE)	χ^2
Race/Ethnicity					
White	70.9 (.015)	67.1 (.018)	80.6 (.011)	74.9 (.015)	42.8**
Black	11.1 (.007)	12.5 (.008)	7.7 (.005)	9.1 (.007)	
American Indian/Alaskan Native	2.2 (.002)	1.8 (.001)	2.7 (.003)	3.1 (.004)	
Asian/Pacific Islander	4.3 (.005)	5.6 (.006)	1.4 (.003)	2.2 (.005)	
Hispanic	11.6 (.012)	12.9 (.014)	7.6 (.008)	10.6 (.012)	
Gender					
Male	47.9 (.003)	38.3 (.004)	66.3 (.007)	66.1 (.009)	752.3**
Female	52.1 (.003)	61.7 (.004)	33.7 (.007)	33.9 (.009)	
Marital status					
Married	63.8 (.005)	64.4 (.006)	68.1 (.007)	55.5 (.008)	74.1**
Separated/Divorced	18.9 (.003)	19.7 (.003)	16.8 (.005)	17.7 (.007)	
Never married	17.4 (.005)	15.8 (.005)	15.1 (.006)	26.8 (.008)	
Personal income ¹					
\$0-\$19,999	18.6 (.005)	20.4 (.005)	12.5 (.005)	18.2 (.007)	50.1**
\$20,000 - \$34,999	18.5 (.004)	19.7 (.004)	14.9 (.006)	17.9 (.007)	
\$35,000 - \$69,999	32.8 (.004)	32.1 (.004)	33.8 (.007)	34.5 (.009)	
\$70,000 and over	30.2 (.008)	27.8 (.008)	38.8 (.011)	29.3 (.011)	
Age					
18 to 24 years	7.6 (.002)	7.0 (.003)	5.4 (.004)	12.8 (.006)	158.4**
25 to 44 years	38.5 (.004)	34.9 (.005)	40.2 (.008)	51.5 (.008)	
45 to 64 years	34.6 (.003)	34.1 (.004)	40.0 (.007)	30.3 (.008)	
65 years or older	19.3 (.003)	24.0 (.005)	14.3 (.005)	5.4 (.004)	
Unemployed	8.1 (.002)	7.6 (.002)	6.8 (.004)	12.1 (.006)	45.6**
Lifetime drug use disorder	12.0 (.004)	3.5 (.002)	18.3 (.006)	40.6 (.009)	2004.8**
Lifetime major depressive disorder	21.9 (.004)	18.3 (.004)	21.1 (.007)	38.5 (.009)	302.2**
Lifetime anxiety disorder	25.4 (.005)	21.9 (.005)	25.4 (.007)	40.8 (.009)	274.5**

All Ns in column headings are expressed as unweighted values. All table values are weighted column percentages (standard errors).

¹Measured as annual household income

** p < .01

Table 2.3. Bivariate comparisons of social network size

	Overall Mean or % (SE)	No AUD M or % (SE) N = 23,500	Alcohol Abuse M or % (SE) N = 6,389	Alcohol Dependence M or % (SE) N = 4,914	<i>F</i>
Spouse/Partner	63.8% (.005)	64.4% (.006)	68.1% (.007)	55.4% (.008)	71.70**
Parents	90.2% (.003)	90.3% (.003) ^d	90.3% (.006) ^d	89.5% (.006) ^d	0.64
Children	1.10 (.015)	1.24 (.019)	1.01 (.024)	.64 (.026)	197.3**
Relatives	5.21 (.062)	5.51 (.084)	4.78 (.098) ^d	4.65 (.117) ^d	24.12**
Friends	4.88 (.054)	4.87 (.069) ^d	4.95 (.082) ^d	4.85 (.105) ^d	0.38
Religious groups	7.97 (.187)	8.36 (.222)	7.21 (.299) ^d	6.67 (.333) ^d	12.66**
Students/Teachers	.48 (.025)	.44 (.027) ^d	.46 (.056) ^d	.70 (.086)	4.92*
Co-workers	2.06 (.037)	1.91 (.043)	2.24 (.077) ^d	2.49 (.113) ^d	16.21**
Neighbors	2.25 (.027)	2.32 (.038) ^d	2.23 (.051) ^d	1.96 (.056)	12.96**
Volunteer groups	1.79 (.051)	1.90 (.069) ^d	1.83 (.094) ^d	1.26 (.093)	16.55**
Other groups	1.96 (.054)	1.81 (.059) ^d	2.48 (.116)	1.96 (.120) ^d	13.98**
TOTAL	31.78 (.491)	32.52 (.672)	31.34 (.811) ^d	28.87 (1.05)	4.03*

All table values are weighted column percentages (standard errors).

Chi square tests use design-based corrected F

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

^d all pair-wise comparison among alcohol use disorder groups were statistically significant ($p < .05$) except groups with this super-script

Table 2.4. Bivariate comparisons of social network diversity

	Overall Mean or % (SE)	No AUD M or % (SE) N = 23,500	Alcohol Abuse M or % (SE) N = 6,389	Alcohol Dependence M or % (SE) N = 4,914	<i>F</i>
Spouse/Partner	63.8% (.005)	64.4% (.006)	68.1% (.007)	55.4% (.008)	71.70**
Parents	90.2% (.003)	90.3% (.003) ^d	90.3% (.006) ^d	89.5% (.006) ^d	0.64
Children	46.2% (.005)	50.6% (.006)	44.3% (.008)	29.6% (.008)	254.77**
Relatives	92.3% (.003)	93.1% (.003)	91.4% (.006) ^d	90.6% (.008) ^d	7.28**
Friends	89.7% (.002)	89.3% (.003)	90.2% (.005) ^d	90.8% (.005) ^d	4.23*
Religious groups	76.8% (.006)	77.3% (.008) ^d	74.9% (.009) ^d	76.0% (.013) ^d	2.28
Students/Teachers	6.0% (.002)	6.0% (.002)	4.9% (.003)	7.6% (.005)	11.64**
Co-workers	40.6% (.004)	37.8% (.004)	43.8% (.007)	48.9% (.009)	84.77**
Neighbors	69.2% (.004)	70.0% (.005) ^d	70.4% (.007) ^d	64.1% (.009)	21.98**
Volunteer groups	17.9% (.004)	18.5% (.005) ^d	19.1% (.006) ^d	14.7% (.007)	15.11**
Other groups	20.6% (.004)	19.7% (.005) ^d	23.9% (.007)	19.9% (.007) ^d	18.08**
TOTAL	4.88 (.024)	4.89 (.031)	5.01 (.031)	4.72 (.033)	22.13**

All table values are weighted column percentages (standard errors).

Chi square tests use design-based corrected F

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

^d all pair-wise comparison among alcohol use disorder groups were statistically significant except groups with this super-script

Table 2.5. Multivariable regression results predicting social network size and social network diversity

N = 34,803	Social network size B (95% CI)	Social network diversity B (95% CI)
Race/Ethnicity		
White	-	-
Black	.02 (-.02 - .06)	.18** (.11 - .25)
Am. Indian/Alk. Native	.06 (-.05 - .16)	-.04 (-.19 - .09)
Asian/Pacific Islander	-.21** (-.29 - -.12)	-.56** (-.70 - -.41)
Hispanic	-.17** (-.22 - -.12)	-.28** (-.34 - -.21)
Gender		
Male	-	-
Female	-.11** (-.13 - -.08)	.13** (.08 - .17)
Marital status		
Married/Cohabiting	.17** (.12 - .21)	1.98** (1.92 - 2.03)
Separated/Divorced/Widowed	-.02 (-.06 - .03)	.44** (.39 - .49)
Never married	-	-
Personal income ¹		
\$0-\$19,999	-	-
\$20,000 - \$34,999	.03 (-.01 - .08)	.14 (.07 - .21)
\$35,000 - \$69,999	.09** (.04 - .14)	.40 (.34 - .47)
\$70,000 and over	.17** (.12 - .22)	.74** (.67 - .82)
Age		
18 to 24 years	-	-
25 to 44 years	-.17** (-.23 - -.09)	-.11** (-.18 - -.03)
45 to 64 years	-.11** (-.18 - -.05)	-.20** (-.28 - -.12)
65 years or older	-.08* (-.16 - -.01)	-1.04** (-1.12 - -.94)
Unemployed	-.25** (-.31 - -.19)	-.76** (-.84 - -.67)
Lifetime drug use disorder	-.12** (-.16 - -.07)	-.09** (-.16 - -.02)
Lifetime major depressive disorder	-.06** (-.10 - -.03)	-.08** (-.13 - -.04)
Lifetime anxiety disorder	-.07** (-.09 - -.03)	-.06* (-.10 - -.01)
Alcohol use disorder grouping		
No AUD	-	-
Alcohol abuse	-.09** (-.14 - -.06)	-.09** (-.15 - -.02)
Alcohol dependence	-.08** (-.13 - -.04)	-.08** (-.14 - -.01)

All table values are weighted column percentages (standard errors).

¹Measured in dollars per year.

* p < .05

** p < .01

References

- Antonovsky, A. (1979). *Health, stress, and coping*. San Francisco: Jossey-Bass.
- Berkman, L. F., & Syme, S. L. (1979). Social Networks, Host Resistance, and Mortality: A Nine-Year Follow-up Study of Alameda County Residents. *American Journal of Epidemiology*, *109*(2), 186–204.
- Bolger, N., & Eckenrode, J. (1991). Social relationships, personality, and anxiety during a major stressful event. *Journal of Personality and Social Psychology*, *61*(3), 440–449.
- Brisette, I., Cohen, S., & Seeman, T. E. (2000). Measuring social integration and social networks. *Social support measurement and intervention: A guide for health and social scientists*. (pp. 53–85). New York, NY, US: Oxford University Press.
- Bullers, S., Cooper, M. L., & Russell, M. (2001). Social network drinking and adult alcohol involvement: A longitudinal exploration of the direction of influence. *Addictive Behaviors*, *26*(2), 181–199.
- Cacioppo, J. T., Ernst, J. M., Burleson, M. H., McClintock, M. K., Malarkey, W. B., Hawkley, L. C., Kowalewski, R. B., et al. (2000). Lonely traits and concomitant physiological processes: the MacArthur social neuroscience studies. *International Journal of Psychophysiology*, *35*(2–3), 143–154.
- Cacioppo, J. T., Hawkley, L. C., & Berntson, G. G. (2003). The Anatomy of Loneliness. *Current Directions in Psychological Science*, *12*(3), 71–74.
- Cacioppo, J. T., Hawkley, L. C., Crawford, L. E., Ernst, J. M., Burleson, M. H., Kowalewski, R. B., Malarkey, W. B., et al. (2002). Loneliness and Health: Potential Mechanisms. *Psychosomatic Medicine*, *64*(3), 407–417.
- Cassel, J. (1976). The Contribution of the Social Environment to Host Resistance. *American Journal of Epidemiology*, *104*(2), 107–123.
- Cobb, S. (1976). Presidential Address-1976. Social support as a moderator of life stress. *Psychosomatic Medicine*, *38*(5), 300–314.
- Cohen, S, Doyle, W. J., Skoner, D. P., Rabin, B. S., & Gwaltney, J. M. (1997). Social ties and susceptibility to the common cold. *Journal of the American Medical Association*, *277*(24), 1940–1944.
- Cohen, S., & Williamson, G. M. (1991). Stress and infectious disease in humans. *Psychological Bulletin*, *109*(1), 5–24.
- Cohen, S., & Wills, T. A. (1985). Stress, social support, and the buffering hypothesis. *Psychological Bulletin*, *98*(2), 310–357.
- DeJong, W., Schneider, S. K., Towvim, L. G., Murphy, M. J., Doerr, E. E., Simonsen, N. R., Mason, K. E., et al. (2006). A Multisite Randomized Trial of Social Norms Marketing Campaigns to Reduce College Student Drinking. *Journal of Studies on Alcohol and Drugs*, *67*(6), 868.
- Durkheim, E. (1997). *Suicide*. (J. A. Spaulding, Trans.). New York: Free Press.
- Gallo, F. (1983). The Effects of Social Support Networks on the Health of the Elderly. *Social Work in Health Care*, *8*(2), 65–74.
- Gordon, A. J., & Zrull, M. (1991). Social networks and recovery: One year after inpatient treatment. *Journal of Substance Abuse Treatment*, *8*(3), 143–152.
- Grant, B. F., Dawson, D. A., Stinson, F. S., Chou, S. P., Dufour, M. C., & Pickering, R. P. (2004). The 12-month prevalence and trends in DSM-IV alcohol abuse and dependence:

- United States, 1991–1992 and 2001–2002. *Drug and Alcohol Dependence*, 74(3), 223–234.
- Grant, B. F., Hasin, D. S., Stinson, F. S., Dawson, D. A., Patricia Chou, S., June Ruan, W., & Huang, B. (2005). Co-occurrence of 12-month mood and anxiety disorders and personality disorders in the US: results from the National Epidemiologic Survey on Alcohol and Related Conditions. *Journal of Psychiatric Research*, 39(1), 1–9.
- Grant, B.F., Moore, T.C., Shepard, J., & Kaplan, K. (2003). *Source and Accuracy Statement: Wave I National Epidemiologic Survey on Alcohol and Related Conditions (NESARC)*. Bethesda, M.D.: National Institute of Alcoholism and Alcohol Abuse.
- Groh, D. R., Olson, B. D., Jason, L. A., Davis, M. I., & Ferrari, J. R. (2007). A factor analysis of the important people inventory. *Alcohol and Alcoholism*, 42(4), 347–353.
- Haines, V. A., & Hurlbert, J. S. (1992). Network Range and Health. *Journal of Health and Social Behavior*, 33(3), 254–266.
- Hasin, D.S., Paykin, A., Endicott, J., & Grant, B. (1999). The Validity of DSM-IV Alcohol Abuse: Drunk Drivers versus All Others. *Journal of Studies on Alcohol and Drugs*, 60(6), 746.
- Hasin, D. S., Grant, B., & Endicott, J. (1990). The natural history of alcohol abuse: Implications for definitions of alcohol use disorders. *The American Journal of Psychiatry*, 147(11), 1537–1541.
- Hasin, D. S., Stinson, F. S., Ogburn, E., & Grant, B. F. (2007). Prevalence, Correlates, Disability, and Comorbidity of DSM-IV Alcohol Abuse and Dependence in the United States: Results From the National Epidemiologic Survey on Alcohol and Related Conditions. *Arch Gen Psychiatry*, 64(7), 830–842.
- Hasin, D.S., Van Rossem, R., McCloud, S., & Endicott, J. (1997). Alcohol Dependence and Abuse Diagnoses: Validity in Community Sample Heavy Drinkers. *Alcoholism: Clinical and Experimental Research*, 21(2), 213–219.
- Hong, J., Seltzer, M. M., & Krauss, M. W. (2001). Change in Social Support and Psychological Well-Being: A Longitudinal Study of Aging Mothers of Adults with Mental Retardation. *Family Relations*, 50(2), 154–163.
- House, J. S., Landis, K. R., & Umberson, D. (1988). Social relationships and health. *Science*, 241(4865), 540–545.
- House, J. S., Robbins, C., & Metzner, H. L. (1982). The Association of Social Relationships and Activities with Mortality: Prospective Evidence from the Tecumseh Community Health Study. *American Journal of Epidemiology*, 116(1), 123–140.
- Kopelman, M. D., Thomson, A. D., Guerrini, I., & Marshall, E. J. (2009). The Korsakoff Syndrome: Clinical Aspects, Psychology and Treatment. *Alcohol and Alcoholism*, 44(2), 148–154.
- Marsden, P. V. (1990). Network Data and Measurement. *Annual Review of Sociology*, 16, 435–463.
- Mattern, J. L., & Neighbors, C. (2004). Social Norms Campaigns: Examining the Relationship between Changes in Perceived Norms and Changes in Drinking Levels. *Journal of Studies on Alcohol and Drugs*, 65(4), 489.
- McCrary, B. S. (2004). To Have But One True Friend: Implications for Practice of Research on Alcohol Use Disorders and Social Network. *Psychology of Addictive Behaviors*, 18(2), 113–121.
- Mitchell, J. C. (1974). Social Networks. *Annual Review of Anthropology*, 3, 279–299.

- Moen, P., Dempster-McClain, D., & Williams, R. M. (1992). Successful Aging: A Life-Course Perspective on Women's Multiple Roles and Health. *American Journal of Sociology*, 97(6), 1612–1638.
- Mohr, C. D., Averna, S., Kenny, D. A., Boca, D., & K, F. (2001). "Getting By (or Getting High) with a Little Help from My Friends": An Examination of Adult Alcoholics' Friendships. *Journal of Studies on Alcohol and Drugs*, 62(5), 637.
- Nathan, P., & Gorman, J. M. (2002). *A Guide To Treatments that Work*. Oxford University Press.
- Page, R. M., & Cole, G. E. (1991). Loneliness and alcoholism risk in late adolescence: A comparative study of adults and adolescents. *Adolescence*, 26(104), 925–930.
- Perkins, H. W., & Craig, D. W. (2006). A Successful Social Norms Campaign to Reduce Alcohol Misuse Among College Student-Athletes. *Journal of Studies on Alcohol and Drugs*, 67(6), 880.
- Pressman, S. D., Cohen, S., Miller, G. E., Barkin, A., Rabin, B. S., & Treanor, J. J. (2005). Loneliness, Social Network Size, and Immune Response to Influenza Vaccination in College Freshmen. *Health Psychology*, 24(3), 297–306.
- Price, R. H., & Politser, P. E. (1980). *Evaluation and action in the social environment*. Academic Press.
- Rehm, J., Mathers, C., Popova, S., Thavorncharoensap, M., Teerawattananon, Y., & Patra, J. (2009). Global burden of disease and injury and economic cost attributable to alcohol use and alcohol-use disorders. *The Lancet*, 373(9682), 2223–2233.
- Rook, K. S. (1984). Research on social support, loneliness, and social isolation: Toward an integration. *Review of Personality & Social Psychology*, 5, 239–264.
- Rubinstein, R. L., Lubben, J. E., & Mintzer, J. E. (1994). Social Isolation and Social Support: An Applied Perspective. *Journal of Applied Gerontology*, 13(1), 58–72.
- Sadava, S. W., & Pak, A. W. (1994). Problem drinking and close relationships during the third decade of life. *Psychology of Addictive Behaviors*, 8(4), 251–258.
- Seeman, T. E., Berkman, L. F., Blazer, D., & Rowe, J. W. (1994). Social ties and support and neuroendocrine function: The MacArthur studies of successful aging. *Annals of Behavioral Medicine*, 16(2), 95–106.
- Sorkin, D., Rook, K. S., & Lu, J. L. (2002). Loneliness, lack of emotional support, lack of companionship, and the likelihood of having a heart condition in an elderly sample. *Annals of Behavioral Medicine*, 24(4), 290–298.
- StataCorp. (2011). *Stata Statistical Software: Release 12*. College Station, TX: StataCorp LP.
- Taylor, S. E., Falke, R. L., Shoptaw, S. J., & Lichtman, R. R. (1986). Social support, support groups, and the cancer patient. *Journal of Consulting and Clinical Psychology*, 54(5), 608–615.
- Thoits, P. A. (1983). Multiple identities and psychological well-being: A reformulation and test of the social isolation hypothesis. *American Sociological Review*, 48(2), 174–187.
- Tracy, E. M., & Biegel, D. E. (2006). Personal Social Networks and Dual Disorders: A Literature Review and Implications for Practice and Future Research. *Journal of Dual Diagnosis*, 2(2), 59–88.
- U.S. Department of Health and Human Services (USDHHS). (2010a). *Healthy People 2020*. Washington, DC 2010.
- U.S. Department of Health and Human Services (USDHHS). (2010b). *The contributions of behavioral and social sciences research to improving health of the nation: A prospectus for the future*. Washington, DC 2010.

- Uchino, B. N., Cacioppo, J. T., & Kiecolt-Glaser, J. K. (1996). The relationship between social support and physiological processes: A review with emphasis on underlying mechanisms and implications for health. *Psychological Bulletin*, *119*(3), 488–531.
- Umberson, D. (1987). Family Status and Health Behaviors: Social Control as a Dimension of Social Integration. *Journal of Health and Social Behavior*, *28*(3), 306–319.
- Speck, R. (1967). Psychotherapy of the Social Network of a Schizophrenic Family. *Family Process*, *6*(2), 208–214.
- Wenzel, S. L., Tucker, J. S., Golinelli, D., Green Jr., H. D., & Zhou, A. (2010). Personal network correlates of alcohol, cigarette, and marijuana use among homeless youth. *Drug and Alcohol Dependence*, *112*(1–2), 140–149.
- Westermeyer, J., & Neider, J. (1988). Social networks and psychopathology among substance abusers. *The American Journal of Psychiatry*, *145*(10), 1265–1269.
- Westermeyer, J., Thuras, P., & Waaijer, A. (2004). Size and Complexity of Social Networks among Substance Abusers: Childhood and Current Correlates. *The American Journal on Addictions*, *13*(4), 372–380.

Chapter 3: Social network ties and treatment for alcohol dependence

Abstract

Background: Common reasons for not seeking treatment for alcohol dependence suggest many individuals wait until problems are severe (e.g. high alcohol consumption levels) before any treatment is sought. However, social network ties may play a moderating role in the relationship between alcohol consumption level and treatment use. It is hypothesized that high alcohol consumption is positively related to treatment use for alcohol dependence. However, the strength of this relationship is attenuated by social network ties, resulting in a lower probability for treatment use among individuals with high alcohol consumption and few social network ties, compared to individuals with high alcohol consumption and many social network ties.

Methods: 1,433 respondents from the NESARC were assessed for the presence of lifetime alcohol dependence, treatment use, alcohol consumption, social network ties, sociodemographics and clinical characteristics. Bivariate comparisons examined correlates of treatment use. Multivariate logistic regression analyses were used to examine the interaction of alcohol consumption and social network ties as a predictor of treatment use while adjusting for sociodemographic and other clinical variables.

Results: Individuals with higher alcohol consumption, men, younger in age, and individuals with a co-occurring past-year drug use disorder, major depression, or anxiety disorder were more likely to seek treatment. Logistic regression analysis showed that while adjusting for sociodemographic and other clinical variables, social network ties moderate the relationship

between level of alcohol consumption and treatment use such that for individuals with few network ties, the effect of alcohol consumption on treatment use was attenuated compared to the effect of alcohol consumption on treatment use for individuals with many network ties.

Conclusion: Individuals high in alcohol consumption with few social network ties represent an at-risk group where the need for treatment is high, but probability of treatment use is low.

Findings offer insight into the development of novel strategies for reaching high-risk groups and offer cross-sectional evidence that promoting social network ties in the broader community may contribute to increased treatment use for alcohol dependence among those most in need.

Introduction

Treatment for alcohol dependence

An estimated 7.9 million Americans experience alcohol-dependence at some point in the past year (Grant et al., 2004). While effective treatment exists, only about 28% of individuals suffering from alcohol abuse or dependence seek help for their problems (Cohen, Feinn, Arias, & Kranzler, 2007). Common reasons that many alcohol dependent adults site for not seeking treatment include: Feeling like they are strong enough to handle it on their own, thinking the problem will get better on its own and they stopped drinking on their own (Cohen et al., 2007). Generally speaking, from these commonly cited reasons for not seeking treatment, it can be concluded that many alcohol-dependent adults wait until problems are severe before any treatment is sought. This conclusion is supported in research which also suggests that an individual's level of alcohol consumption is a robust measure of problem severity associated with alcohol dependence and is significantly related to treatment use (Booth, Yates, Petty, & Brown, 1991; Kaskutas, Weisner, & Caetano, 1997).

Social network ties and health

An objective of *Healthy People 2020* (USDHHS, 2010a) is to increase the number of individuals diagnosed with alcohol dependence who receive treatment. Paired with the National Institute of Health (NIH) strategic initiative of systems-thinking approaches to health (USDHHS, 2010b), the social network ties an individual has may reveal important keys to how persons experiencing health problems, such as alcohol dependence, adopt strategies to promote health and well-being.

Generally speaking, social network ties an individual has to other groups represents a stable influence in the decisions made concerning health and wellness (Cohen, Doyle, Skoner, Rabin, & Gwaltney, 1997; House, Landis, & Umberson, 1988; Morgan, Neal, & Carder, 1997). Social network ties are often measured in two distinct ways; social network size and social network diversity. Social network size is defined as the number of persons (across all types of social relationships) for which individuals report frequent (varying between 2 weeks and 1 month) social interaction. Social network diversity measures number of social roles (types of social relationships) for which individuals report some level of participation between 2 weeks and 1 month (Brissette, Cohen, & Seeman, 2000). However, social network size has been criticized as a relatively weak predictor of health, with social network diversity as the preferred measurement to explore the relationships between health and social network ties (Cohen & Wills, 1985; Uchino, Cacioppo, & Kiecolt-Glaser, 1996). Here, social network ties are examined using a social network diversity framework such that social network ties are defined as the number of social roles (types of social relationships) for which individuals report some level of participation between 2 weeks and 1 month (Brissette, Cohen, & Seeman, 2000).

The social network ties an individual has to others are strongly related to positive health outcomes. Increased social network ties to others is significantly related to reduced mortality rates associated with illness (Berkman & Syme, 1979), an increased knowledge concerning navigating mental health treatment systems (Pescosolido, 1992), and an increase in the receipt of positive social norms concerning health and health management (Cacioppo, Hawkey, & Berntson, 2003). However, the relationship between social network ties to others and health has many critical research gaps. One such gap concerns whether increased social network ties promote treatment use for alcohol dependence.

Social network ties and treatment use

Traditional research examining treatment usage for many health-related problems, including alcohol dependence, tends to focus on treatment use as a function of resource accessibility, illness severity and “predisposing” characteristics known to be associated with service use (Andersen, 1968; Kroeger, 1983). Additional often cited models of mental health treatment use incorporate social psychological concepts such as the “state of treatment readiness” (beliefs of severity) and “evaluation of circumstances” (perceived benefits) (Becker et al., 1977; Rosenstock, Strecher, & Becker, 1988).

However, these models of treatment use often place a high value on rational decision-making, which locate the source of the decision seeking mental health treatment within individuals. Presumably, individuals weigh the costs and benefits of treatment at a given point in time, and make a calculated decision to enter into, or abstain from treatment. These models imply social influence as only additional factors to be considered in the sum total of the rational decision-making process. However, network models associated with treatment use for health-related problems focus on how social networks influence the use of health treatment services

(Levy & Pescosolido, 2002; Pescosolido, 1992; Sanders & Suls, 1982). These models examine the importance of social network ties on whether people use health-related services.

Available research on the relationship between social network ties and treatment use for alcohol dependence presents conflicting findings. On the one hand, increased social network ties can serve as a substitute for alcohol dependence treatment. For example, the increased negative feedback concerning an individual's drinking that comes from a larger number of social network ties is known to significantly predict the phenomenon known as natural recovery, or achieving remission from an alcohol dependence diagnosis without seeking any formal treatment services (Humphreys & Noke, 1997). Additionally, research on social network ties and treatment use for alcohol dependence shows a similarly negative relationship when social support from social network ties is examined. For example, a larger amount of social support provided by social network ties is negatively related to treatment use for alcohol dependence (Maulik, Eaton, & Bradshaw, 2009).

On the other hand, the number of social network ties can, at times, serve as a positive influence for pursuing treatment for alcohol dependence. For example, a large number of social network ties that transmit social norms concerning when cutting down on alcohol use is needed can be a significant predictor of treatment use (Weisner, 1993). Social network ties can also transmit needed information about treatment services, including where to access treatment services, what types of treatments are available, and whether they are perceived as effective (Gourash, 1978).

One possible explanation for the divergent findings associated with the influence of social network ties and treatment use concerns the moderating role that social network ties may play in the relationship between alcohol consumption and treatment use. For example, an alcohol

dependent individual with a high level of alcohol consumption and many social network ties may receive the positive influences of social network ties including social norms messages concerning cutting down on alcohol use. But at the same time, the social network ties of an alcohol dependent individual with a high level of alcohol consumption and many social network ties may not possess the resources to provide any assistance towards natural recovery. Thus for an individual with both a high level of alcohol consumption and many social network ties, it is likely that social network ties provide a positive relationship for treatment of alcohol dependence.

However, an alcohol dependent individual with a high level of alcohol consumption and few social network ties may be offered less knowledge from their social network ties concerning whether drinking is excessive and what an individual can do about it (*vis-à-vis* seeking treatment). In this situation, an individual with a high level of alcohol consumption and a small number of social network ties may not experience the same positive relationship between social network ties and alcohol consumption as an individual with many network ties and a high level of problem severity.

In an attempt to resolve the conflicting findings concerning social ties and treatment use for alcohol dependence, here I examine whether social network ties moderate the relationship between level of alcohol consumption and treatment use for alcohol dependence. Specifically, this paper proposes the following hypotheses: 1) Controlling for additional known factors related to treatment use, there is a positive relationship between higher alcohol consumption and treatment use for alcohol dependence. 2) Controlling for additional known factors related to treatment use, social network ties moderate the positive relationship between alcohol consumption and treatment use. As the number of network ties increase, the magnitude of the

relationship between alcohol consumption and treatment use increases. However, as the number of network ties decreases, the magnitude of the relationship between alcohol consumption and treatment use relationship decreases.

Methods

Sample

To examine these hypotheses, data is examined from the secondary data used to examine these research questions comes from wave 2 of The National Epidemiologic Survey on Alcohol Related Conditions (NESARC). NESARC is a population-representative survey of United States adults aged 18 or older living in noninstitutionalized settings. Wave 2 NESARC data were collected between 2004 and 2005 and included 34,653 of wave 1 respondents (reflecting an 86.7% response rate) (Grant et al., 2004, 2005; Hasin et al., 2007). Since it is arguable that those with alcohol dependence (compared to those with alcohol abuse) are most in need of alcohol use disorder treatment, the sample for all hypotheses includes respondents who met diagnostic criteria for past-year DSM-IV alcohol dependence at wave 2 (N = 1,433). Only wave 2 NESARC data was used because social network measures are contained in the second wave, and not the first. Wave 2 NESARC data was weighted to reflect survey design characteristics and to account for oversampling of certain groups. NESARC data were also weighted to be representative of the U.S. population on socioeconomic variables, based on the 2000 decennial census.

Measurement

Alcohol consumption. Individual alcohol consumption is measured through self-reported average daily alcohol consumption in the past year, in ounces. This is the only measure present in the NESARC that examines alcohol use across a variety of alcoholic beverages, including beer, wine, wine coolers and hard liquor. Alcohol consumption is a computed continuous

measure that corrects for the variance in alcohol content between different beverages including beer, wine, liquor and wine coolers. The reliability of the alcohol consumption measure available in the NESARC has shown an acceptable level of reliability (ICC = .70) (Grant et al., 2003).

Social ties. Social ties are measured by the social network index (Cohen et al., 1997), which examines the number of social groups in which the respondent has regular contact (i.e. at least once every two weeks) with at least one person. Through the Social Network Index, a count variable was created that assessed individuals for membership in 11 different types of social groups.

Treatment use. Treatment use is conceptualized as the receipt of any treatment in the past-year versus no treatment in the past-year among any of the 13 help sources examined in the NESARC, including alcoholics anonymous, family/social services, alcohol/drug detox program, inpatient psychiatric program, outpatient clinic, alcohol/drug rehab program, emergency room, halfway house, crisis center, employee assistance program, clergy/priest/rabbi, private physician, or “other” agency or professional.

Sociodemographics. Participants were assessed for several sociodemographic characteristics including race/ethnicity group, including White (non-Hispanic), Black, American Indian/Alaskan Native, Asian/Pacific Islander, and Hispanic, gender, age (in years), and education status, including less than high school/GED equivalent, completed high school/GED equivalent, and more than high school/GED equivalent.

Resource availability. Individual resource availability is examined through two measures, a categorical measure examining annual household income, and a binary variable examining whether the individual had some form of insurance from the 7 types examined in the NESARC

in the previous year, including Medicare, Medi-gap, Medicaid, VA Tricare, private insurance, long-term care or any “other” form of health insurance.

Co-occurring disorders. Binary variables examined individuals assessed whether DSM criteria was met for either past-year drug use disorder, past-year major depressive disorder, or a past-year anxiety disorder, including either the presence of social phobia, panic disorder, and generalized anxiety disorder. These 2 disorders were selected for the study given their higher levels of prevalence in the U.S. population compared to other mental health disorders (Hasin et al, 2007).

Analyses

Analyses were computed using weighted population analyses in STATA Version 12 (StataCorp, 2011). This system implements a Taylor series linearization to adjust for the complex survey design. Chi-square tests were used to make bivariate comparisons between each categorical variable and whether treatment had been received in the past year. ANOVA was used to make bivariate comparisons between each continuous variable and whether treatment had been received in the past year. Logistic regression analysis was used to examine whether social network ties moderate the relationship between level of alcohol consumption and treatment use for alcohol dependence.

Results

Table 1 shows within the NESARC sample of individuals with past-year alcohol dependence, a mean consumption level of 2.48 ounces of alcohol per day in the past year were reported. Individuals reported a mean of 4.41 (out of 11) social ties in their social networks. Additionally, 67.5% of participants were White/Non-Hispanic, 68.6% were male, with a mean age of 36.6 year. Most individuals reported an education level beyond a high school/GED

diploma (57.9%). Mean annual household income for the sample was \$35,000 to \$69,000, and 76.4% reported some form of insurance in the past year. In terms of co-occurrence, 10.2% reported a past-year drug use disorder, 22.9% reported a past-year major depressive disorder, and 27.8% reported a past-year anxiety disorder. Last, 11.9% of past-year alcohol-dependent adults in the NESARC reported seeking any form of treatment in the past year.

Chi-square and ANOVA analyses contained in table 1 also shows that a significant difference emerged in mean level of alcohol consumption between individuals who sought treatment (4.2 ounces) and individuals who did not (2.2 ounces), $F(1,44) = 20.4, p < .01$. Additionally, a significant difference emerged in gender between individuals who sought treatment and individuals who did not, $\chi^2(1, N = 1,433) = 4.9, p < .05$. Among individuals who sought treatment, 67.4% were male, while 32.7% were female. Among individuals who did not seek treatment, 76.9% were male, while 23.1% were female. Furthermore, a significant difference emerged in age between individuals who sought treatment (36.3 year) and individuals who did not (39.3 years), $F(1,44) = 7.8, p < .01$.

In terms of co-occurring disorders, a significant difference emerged in past-year drug use disorder between individuals who sought treatment (17.4%) and individuals who did not (9.2%), $\chi^2(1, N = 1,433) = 6.9, p < .05$. Additionally, a significant difference emerged in major depressive disorder between individuals who sought treatment (40.1%) and individuals who did not (20.4%), $\chi^2(1, N = 1,433) = 29.5, p < .01$. Last, a significant difference emerged in past-year anxiety disorder between individuals who sought treatment (45.5%) and individuals who did not (25.2%), $\chi^2(1, N = 1,433) = 19.6, p < .01$.

A logistic regression model, presented in table 3, examining whether level of alcohol consumption serves as a moderator for the directional influence of social ties on treatment use,

analyzed alcohol consumption, social ties and their mean-centered interaction as predictors of past year treatment use while adjusting for sociodemographic and other clinical variables. This model showed that men had higher odds of treatment use than women (OR = 1.91, $p < .05$). Additionally, individuals older in age also showed higher odds of treatment use than individuals younger in age (OR = 1.02, $p < .05$). In terms of co-occurring disorder, individuals with a past-year major depressive disorder were more likely to use treatment (OR = 2.12, $p < .01$), as well as individuals with a past-year anxiety disorder (OR = 1.94, $p < .05$). Individuals with higher levels of alcohol consumption had higher odds of treatment use (OR = 1.09, $p < .05$). Social ties were not a significant predictor of treatment use. However, the product term created to examine whether social network ties moderate the relationship between level of alcohol consumption and treatment use for alcohol dependence was significant (OR = 1.04, $p < .05$).

Regression coefficients associated with the relationship between alcohol consumption and predicted probability for treatment use for individuals with few network ties (1 standard deviation below the sample mean of network ties) and many network ties (1 standard deviation above the sample mean of network ties) is presented in figure 2. Simple slopes analysis to examine regression lines presented in figure 2 showed that the slope for individuals with few network ties differed significantly from zero, $t(1,435) = 2.45$, $p < .01$. Further, simple slopes analysis showed that the slope for individuals with many network ties differed significantly from zero as well, $t(1,435) = 2.26$, $p < .05$, suggesting that level of alcohol use is significantly related to an increased probability of treatment use among both individuals with few network ties and individuals with many network ties. However, for individuals with few network ties, the effect of alcohol consumption on treatment use was highly attenuated compared to the effect of alcohol consumption on treatment use for individuals with many network ties.

Discussion

The results from individuals with alcohol dependence show that a higher level of alcohol consumption is a correlate of treatment use. This finding offer further evidence into the conclusion from previous work that many individuals wait until alcohol use is severe before they seek treatment (Booth, Yates, Petty, & Brown, 1991; Kaskutas, Weisner, & Caetano, 1997). Additional bivariate correlates of treatment use include gender (male), younger age, and the presence of co-occurring mental health diagnoses (past-year drug use disorder, major depression & anxiety).

Logistic regression analyses showed that while controlling for sociodemographic and other clinical variables, social network ties moderates the relationship between alcohol consumption and treatment use. Individuals with a high level of alcohol consumption paired with larger number of social network ties showed an increased probability for treatment use. These results may be explained by the finding that while social network ties offer support and feedback concerning alcohol use, which can serve as a deterrent from treatment (Humphreys & Noke, 1997; Maulik, Eaton, & Bradshaw, 2009), an individual with a high level of alcohol consumption exceeds capacity for a network to offer treatment substitutes.

Additionally, logistic regression analyses show that a high level of alcohol consumption paired with few numbers of social ties offers less influence on treatment use. This finding may suggest that a social network composed of fewer social ties may mean that less knowledge is provided to an alcohol dependent individual concerning whether their drinking is, in fact, excessive and what to do about it (e.g. where to seek treatment for alcohol dependence) (Gourash, 1978). Finally, these findings suggest that individuals with a high level of alcohol

consumption with few social network ties represents a high risk group not likely to seek treatment, that is in need of further examination.

Limitations

While this chapter offers key insights into resolving some of the differences in research concerning how social networks influence treatment use among individuals with alcohol dependence, there are important limitations that are in need of address. First, data from the NESARC is of a cross-sectional design. These findings are correlational and with the available data, formally tests of causal paths concerning alcohol consumption, social network ties and treatment use cannot be examined. Additionally, the findings assume that social network ties are stable through time in that social network ties are stable before and after treatment for alcohol dependence, while limited evidence suggests that social network ties are stable through time (Morgan et al., 1996; Volls, et al, 2008), it is uncertain whether these findings are generalizable to a population of adults with alcohol dependence.

Conclusions

With these limitations in mind, the results offer several implications for social work practice as well as challenges in designing social network interventions intended to promote the use of treatment for alcohol dependence. First, these results offer insight into high-risk groups that may benefit substantially from social work interventions designed to increase the use of treatment services for alcohol dependence. Through the creation of interventions intended to promote treatment for alcohol dependence among individuals with a high level of alcohol consumption and few network ties, social work practice can assist in meeting the specific initiatives contained in *Healthy People 2020* (USDHHS, 2010a) to increase the proportion of persons who need alcohol abuse or alcohol dependence treatment.

However, these results offer challenges for social workers interested in using a social network ties-based intervention strategy to promote treatment for alcohol dependence. These results suggest that not all individuals will benefit from interventions designed to increase social network ties. Previous research on social network ties and who is most likely to have fewer social network ties suggests that women (opposed to men) (Cohen & Janicki-Deverts, 2009), individuals with a high level of problem severity (such as increased levels of alcohol consumption) (Burk, van der Vorst, Kerr, & Stattin, 2012), individuals with lower socioeconomic backgrounds (Westermeyer, Thuras, & Waaijer, 2004), and individuals with co-occurring mental health and substance use disorders (Tracy & Biegel, 2006) are individuals most likely to have fewer network ties.

The knowledge of who is most likely to have a fewer number of social ties, paired with the findings from above, offer social workers two unique challenges: Where individuals who are part of these groups congregate and what specific social service organizations serve these groups? Identifying populations of individuals with few network ties and where they are served will offer a tremendous amount of insight into the creation of a social network ties-based intervention that can successfully increase the use of treatment services among individuals with alcohol dependence.

Finally, these findings offer insight into the specific ways that social work practice, and its focus on psychosocial aspects of mental health and substance abuse, can assist in promoting treatment for alcohol dependence. These results suggest that any efforts to promote the formation social network ties, or more broadly, community connections, through individuals and organizations may result in an indirect effect on increased treatment use for alcohol dependence,

especially among individuals who consume large amounts of alcohol - those who may need treatment services the most.

Table 3.1. Descriptive summary and treatment use among individuals with alcohol dependence

	Overall % or <i>M</i> (SE) N = 1,433	Sought treatment % or <i>M</i> (SE) N = 1,262	No treatment % or <i>M</i> (SE) N = 171	F or (<i>X</i> ²)
Alcohol consumption ¹	2.5 (.05)	2.2 (.06)	4.2 (.18)	20.4**
Social network ties ²	4.4 (.11)	4.4 (.11)	4.2 (.51)	1.5
Race/Ethnicity				
White	67.5 (.02)	67.1 (.02)	70.9 (.04)	(0.3)
Hispanic	14.1 (.02)	14.3 (.02)	11.9 (.04)	
African American	12.6 (.01)	12.9 (.02)	10.5 (.03)	
American Indian/Alaskan Native	3.1 (.01)	3.1 (.01)	3.4 (.02)	
Asian/Pacific Islander	2.7 (.01)	2.7 (.01)	3.4 (.02)	
Gender				
Male	68.6 (.01)	67.4 (.02)	76.9 (.03)	(4.9*)
Female	31.4 (.01)	32.7 (.02)	23.1 (.03)	
Age (in years)	36.6 (.39)	36.3 (.41)	39.3 (1.08)	7.8**
Education				
Less than HS/GED equivalent	15.7 (.01)	15.9 (.01)	14.2 (.03)	(0.5)
Completed HS/GED equivalent	26.4 (.02)	25.9 (.02)	30.2 (.05)	
More than HS/GED equivalent	57.9 (.02)	58.2 (.02)	55.6 (.05)	
Income ³				
\$0-\$19,999	22.6 (.01)	22.1 (.01)	25.5 (.04)	(0.9)
\$20,000 - \$34,999	18.9 (.01)	18.9 (.01)	18.5 (.04)	
\$35,000 - \$69,999	33.9 (.02)	33.5 (.02)	37.3 (.05)	
\$70,000 or more	24.6 (.02)	25.5 (.02)	18.7 (.04)	
Insurance status ⁴	76.4 (.02)	75.9 (.02)	79.5 (.04)	(0.7)
Past-year drug use disorder	10.2 (.01)	17.4 (.04)	9.2 (.01)	(6.9*)
Past-year major depression	22.9 (.01)	40.1 (.04)	20.4 (.01)	(29.5**)
Past-year anxiety disorder	27.8 (.02)	45.5 (.05)	25.2 (.02)	(19.6**)

¹ Measured as average daily alcohol consumption in past year, in ounces

² Measurement from the Social Network Index (Cohen et al, 1997)

³ Measurement in past-year household income

⁴ Measured as percent with any health insurance in past-year

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

Table 3.2. Multivariate analysis of treatment use among those with alcohol dependence

N = 1,433	OR	SE	95% CI
Alcohol consumption ¹	1.09**	0.03	1.04 – 1.14
Network ties ²	0.99	0.07	0.86 – 1.16
Alcohol consumptionXnetwork ties	1.04*	0.02	1.01 – 1.08
Race/Ethnicity			
White	-	-	
Hispanic	1.02	0.32	0.39 – 1.45
African American	0.76	0.24	0.24 – 3.24
American Indian/Alaskan Native	0.94	0.57	0.18 – 10.73
Asian/Pacific Islander	1.42	1.45	0.51 – 1.93
Gender			
Male	1.91*	0.49	1.23 – 3.19
Female	-	-	
Age (in years)	1.02*	0.01	1.01 – 1.04
Education			
Less than HS/GED equivalent	-	-	
Completed HS/GED equivalent	1.59	0.59	0.71 – 3.76
More than HS/GED equivalent	1.47	0.47	0.53 – 4.59
Income ³			
\$0-\$19,999	-	-	
\$20,000 - \$34,999	0.99	0.33	0.51 – 1.94
\$35,000 - \$69,999	1.15	0.34	0.63 – 2.10
\$70,000 or more	0.75	0.24	0.39 – 1.46
Insurance status ⁴			
Past-year drug use disorder	1.3	0.42	0.68 – 2.48
Past-year major depression	2.12**	0.53	1.28 – 3.51
Past-year anxiety disorder	1.94*	0.49	1.17 – 3.22

¹ Measured as average daily alcohol consumption in past year, in ounces

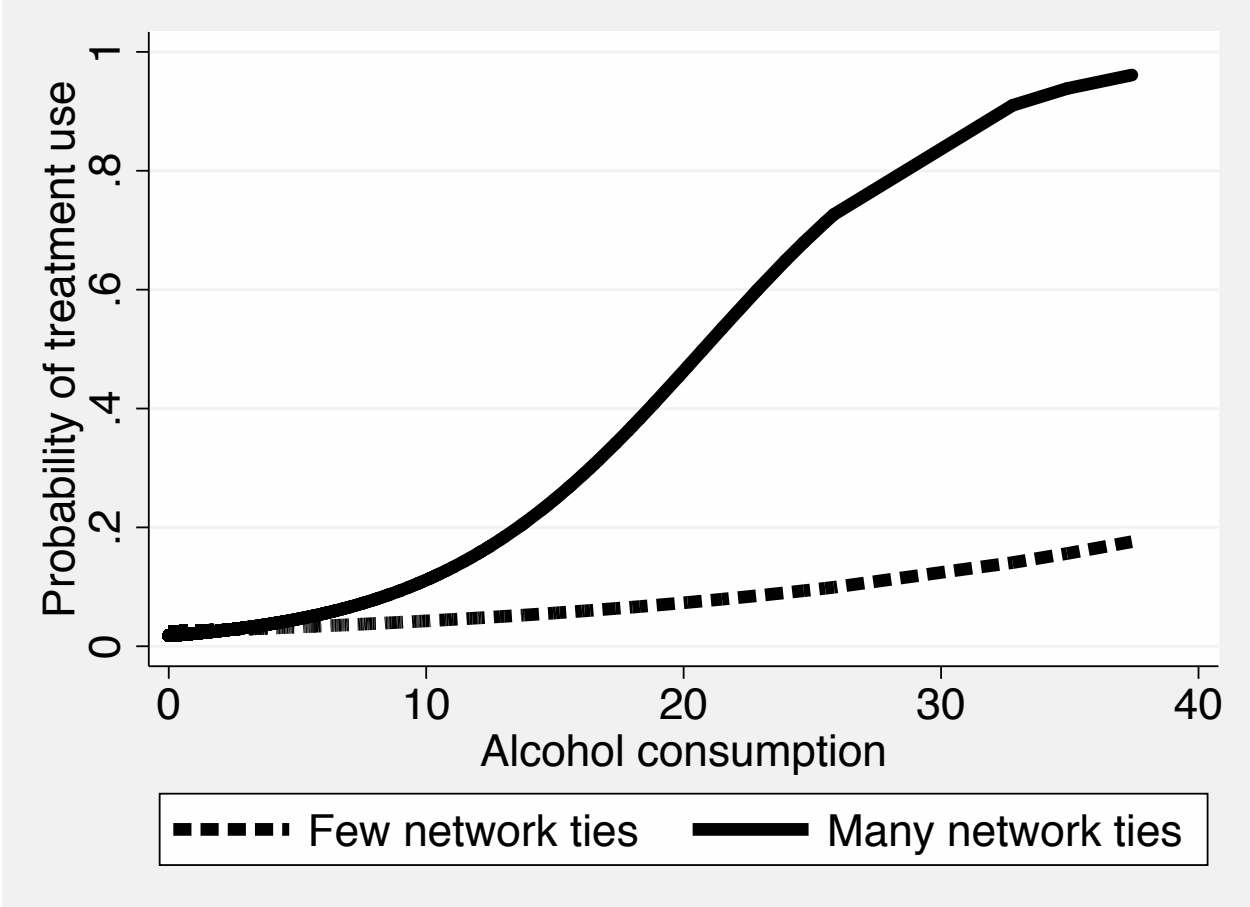
² Measurement from the Social Network Index (Cohen et al, 1997)

³ Measurement in past-year household income

⁴ Measured as percent with any health insurance in past-year

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

Figure 3.1. Moderation of social network ties on the relationship between alcohol consumption and treatment use for alcohol dependence



References

- Andersen, R. (1968). *A behavioral model of families' use of health services*. Center for Health Administration Studies, University of Chicago.
- Becker, M. H., Don P. Haefner, Kasl, S. V., Kirscht, J. P., Maiman, L. A., & Rosenstock, I. M. (1977). Selected Psychosocial Models and Correlates of Individual Health-Related Behaviors. *Medical Care, 15*(5), 27–46.
- Berkman, L. F., & Syme, S. L. (1979). Social Networks, Host Resistance, and Mortality: A Nine-Year Follow-up Study of Alameda County Residents. *American Journal of Epidemiology, 109*(2), 186–204.
- Booth, B. M., Yates, W. R., Petty, F., & Brown, K. (1991). Patient Factors Predicting Early Alcohol-Related Readmissions for Alcoholics: Role of Alcoholism Severity and Psychiatric Co-Morbidity. *Journal of Studies on Alcohol and Drugs, 52*(1), 37.
- Brissette, I., Cohen, S., & Seeman, T. E. (2000). Measuring social integration and social networks. *Social support measurement and intervention: A guide for health and social scientists* (pp. 53–85). New York, NY, US: Oxford University Press.
- Burk, W. J., van der Vorst, H., Kerr, M., & Stattin, H. (2012). Alcohol use and friendship dynamics: selection and socialization in early-, middle-, and late-adolescent peer networks. *Journal of Studies on Alcohol and Drugs, 73*(1), 89–98.
- Cacioppo, J. T., Hawkey, L. C., & Berntson, G. G. (2003). The Anatomy of Loneliness. *Current Directions in Psychological Science, 12*(3), 71–74.
- Cohen, Sheldon, & Janicki-Deverts, D. (2009). Can We Improve Our Physical Health by Altering Our Social Networks? *Perspectives on Psychological Science, 4*(4), 375–378.
- Cohen, E., Feinn, R., Arias, A., & Kranzler, H. R. (2007). Alcohol treatment utilization: Findings from the National Epidemiologic Survey on Alcohol and Related Conditions. *Drug and Alcohol Dependence, 86*(2–3), 214–221.
- Cohen, S., Doyle, W. J., Skoner, D. P., Rabin, B. S., & Gwaltney, J. M. (1997). Social ties and susceptibility to the common cold. *Journal of the American Medical Association, 277*(24), 1940–1944.
- Cohen, S., & Wills, T. A. (1985). Stress, social support, and the buffering hypothesis. *Psychological Bulletin, 98*(2), 310–357.
- Gourash, N. (1978). Help-seeking: a review of the literature. *American Journal of Community Psychology, 6*(5), 413–423.
- Grant, B. F., Dawson, D. A., Stinson, F. S., Chou, P. S., Kay, W., & Pickering, R. (2003). The Alcohol Use Disorder and Associated Disabilities Interview Schedule-IV (AUDADIS-IV): reliability of alcohol consumption, tobacco use, family history of depression and psychiatric diagnostic modules in a general population sample. *Drug and Alcohol Dependence, 71*(1), 7–16.
- Grant, B. F., Dawson, D. A., Stinson, F. S., Chou, S. P., Dufour, M. C., & Pickering, R. P. (2004). The 12-month prevalence and trends in DSM-IV alcohol abuse and dependence: United States, 1991–1992 and 2001–2002. *Drug and Alcohol Dependence, 74*(3), 223–234.
- Grant, B. F., Hasin, D. S., Stinson, F. S., Dawson, D. A., Patricia Chou, S., June Ruan, W., & Huang, B. (2005). Co-occurrence of 12-month mood and anxiety disorders and personality disorders in the US: results from the National Epidemiologic Survey On Alcohol and Related Conditions. *Journal of Psychiatric Research, 39*(1), 1–9.

- Hasin, D. S., Stinson, F. S., Ogburn, E., & Grant, B. F. (2007). Prevalence, Correlates, Disability, and Comorbidity of DSM-IV Alcohol Abuse and Dependence in the United States: Results From the National Epidemiologic Survey on Alcohol and Related Conditions. *Arch Gen Psychiatry*, *64*(7), 830–842.
- House, J. S., Landis, K. R., & Umberson, D. (1988). Social relationships and health. *Science*, *241*(4865), 540–545.
- Humphreys, K., & Noke, J. M. (1997). The Influence of Posttreatment Mutual Help Group Participation on the Friendship Networks of Substance Abuse Patients. *American Journal of Community Psychology*, *25*(1), 1–16.
- Kaskutas, L. A., Weisner, C., & Caetano, R. (1997). Predictors of Help Seeking among a Longitudinal Sample of the General Population, 1984-1992. *Journal of Studies on Alcohol and Drugs*, *58*(2), 155.
- Kroeger, A. (1983). Health Interview Surveys in Developing Countries: A Review of the Methods and Results. *International Journal of Epidemiology*, *12*(4), 465–481.
- Levy, J. A., & Pescosolido, B. A. (2002). *Social Networks and Health*. Emerald Group Publishing.
- Maulik, P. K., Eaton, W. W., & Bradshaw, C. P. (2009). The Role of Social Network and Support in Mental Health Service Use: Findings From the Baltimore ECA Study. *Psychiatric Services*, *60*(9), 1222–1229.
- Moos, R. H., & Moos, B. S. (2006). Rates and predictors of relapse after natural and treated remission from alcohol use disorders. *Addiction*, *101*(2), 212–222.
- Morgan, D. L., Neal, M. B., & Carder, P. (1997). The stability of core and peripheral networks over time. *Social Networks*, *19*(1), 9–25.
- Moyer, A., Finney, J. W., Swearingen, C. E., & Vergun, P. (2002). Brief interventions for alcohol problems: a meta-analytic review of controlled investigations in treatment-seeking and non-treatment-seeking populations. *Addiction*, *97*(3), 279–292.
- Pescosolido, B. A. (1992). Beyond Rational Choice: The Social Dynamics of How People Seek Help. *American Journal of Sociology*, *97*(4), 1096–1138.
- Pescosolido, B.A. (1991). Illness careers and network ties: a conceptual model of utilization and compliance. In Albrecht, G. & Levy, (Eds.), *Advances in Medical Sociology* (pp. 164–181). Greenwich, C.T.: JAI Press.
- Rosenstock, I. M., Strecher, V. J., & Becker, M. H. (1988). Social Learning Theory and the Health Belief Model. *Health Education & Behavior*, *15*(2), 175–183.
- Sanders, G. S., & Suls, J. M. (1982). *Social psychology of health and illness*. L. Erlbaum Associates.
- StataCorp. (2011). *Stata Statistical Software: Release 12*. College Station, TX: StataCorp LP.
- Tracy, E. M., & Biegel, D. E. (2006). Personal Social Networks and Dual Disorders: A Literature Review and Implications for Practice and Future Research. *Journal of Dual Diagnosis*, *2*(2), 59–88.
- Uchino, B. N., Cacioppo, J. T., & Kiecolt-Glaser, J. K. (1996). The relationship between social support and physiological processes: A review with emphasis on underlying mechanisms and implications for health. *Psychological Bulletin*, *119*(3), 488–531.
- U.S. Department of Health and Human Services. (2010). *Healthy People 2020*. Washington, DC 2010.

- U.S. Department of Health and Human Services. (2010). *The contributions of behavioral and social sciences research to improving health of the nation: A prospectus for the future*. Washington, DC 2010.
- Weisner, C. (1993). Toward an Alcohol Treatment Entry Model: A Comparison of Problem Drinkers in the General Population and in Treatment. *Alcoholism: Clinical and Experimental Research*, 17(4), 746–752.
- Westermeyer, J., Thuras, P., & Waaijer, A. (2004). Size and Complexity of Social Networks among Substance Abusers: Childhood and Current Correlates. *The American Journal on Addictions*, 13(4), 372–380.

Chapter 4: The effect of drinking goals at treatment entry on longitudinal alcohol use patterns among adults with alcohol dependence

Abstract

Background: Drinking goals at treatment entry are a promising, yet under-studied mechanism of change in alcohol use following treatment. It is not known who, upon treatment entry, is likely to desire abstinence as a drinking goal and whether desiring abstinence as a drinking goal influences alcohol use following treatment.

Methods: Data from a 2.5-year longitudinal study of alcohol-dependent adults from 3 treatment sites were examined in a secondary analysis. At treatment entry, participants reported sociodemographic and clinical characteristics, as well as whether they desired abstinence as a drinking goal or not. At each subsequent wave, participants reported their alcohol use.

Results: Bivariate analyses showed that individuals from a VA outpatient treatment site, men, and racial or ethnic minorities were most likely to desire abstinence as a drinking goal at treatment entry. Results from multi-level mixed effects regression analyses indicated that individuals who at baseline desired abstinence as a drinking goal sustained higher percentage of days abstinent and higher percentage of days since last drink 2.5 years following treatment entry, compared to individuals who did not desire abstinence.

Conclusions: Understanding who is most likely to desire the specific drinking goal of abstinence can assist clinicians in anticipating client response to goal setting. Furthermore, by understanding the benefits and risks associated with drinking goals, clinicians can focus attention to individuals

who desire a more risk-laden goal, including goals of non-abstinence, and tailor interventions, including motivational interviewing techniques, to support effective goals.

Introduction

Drinking goals as a mechanism of change

Treatments for alcohol dependence can be effective and increase the likelihood of recovery from alcohol problems (Dawson et al., 2006; Moos & Moos, 2006; Moyer et al., 2002). Of those who enter and complete treatment, approximately 60% will relapse to some drinking within the first year following alcohol treatment (Maisto et al., 2003; Whitford et al., 2009). With these findings in mind, current research on the outcomes of alcohol-use-disorder treatments examines mechanisms of change associated with reduced alcohol use (Longabaugh et al., 2006). In this chapter, I analyze the demographic and clinical characteristics of participants who at treatment entry desired abstinence compared to participants who did not and subsequent 2.5-year alcohol-use patterns among participants who desired abstinence compared to participants who did not.

The question of whether individuals entering treatment should be given the choice of treatment goals, such as abstinence, remains a controversial issue in the field of alcohol research (Coldwell & Heather, 2006; Marlatt, 1983; Roizen, 1987). Despite this, allowing adults seeking treatment for alcohol dependence to self-select drinking goals upon treatment entry has become a common treatment practice (Foy et al., 1979; Sobell & Sobell, 1995). With self-selection of drinking goals becoming more common, clinicians may benefit from additional evidence that suggests who is most likely to desire a drinking goal of abstinence or non-abstinence. Clinicians may also benefit from evidence about the effects on subsequent alcohol use of choosing a drinking goal of abstinence or non-abstinence at treatment entry. This study asks: Who is most

likely to desire a drinking goal of abstinence at treatment entry, and does a drinking goal of abstinence predict subsequent drinking patterns?

The selection of drinking goals at treatment entry is a promising, yet under-studied, mechanism of change which may have an impact on alcohol use following treatment (Adamson et al., 2010). Examining drinking goals can have immediate clinical appeal. Clinicians frequently work with clients to establish a drinking strategy, and to instill motivation for maintaining that strategy throughout treatment. When examining outcomes associated with treatment for alcohol use disorders in Project MATCH, identifying abstinence as a drinking goal was a critical element in remission of alcohol dependence (DiClemente, 2007). Additional longitudinal research from the United Kingdom showed that abstinence as a drinking goal upon treatment entry significantly predicted higher percentage of days abstinent one year later (Adamson et al., 2010).

Additionally, clients prefer to have a choice of drinking goal (Sobell & Sobell, 1992) and people are more likely to achieve goals they self-select than goals imposed on them (Bandura, 1986; Brehm & Brehm, 1981; Deci & Ryan, 1985). However, those who desire a non-abstinence drinking goal upon treatment entry continue to drink at heavy levels following treatment, compared to those who select a drinking goal of abstinence (Adamson & Sellman, 2001). This finding suggests that in terms of long-term change, self-selection of drinking goals, especially a non-abstinence drinking goal, may not produce sustained behavioral change

Yet, evidence is mixed as to whether abstinence as a drinking goal at treatment entry has any influence on future alcohol use. Early research on drinking goals showed that when clients were allowed to establish their own goals (either abstinence or non-abstinence), those who adopted a non-abstinence drinking goal experienced drinking problems for a shorter period of time and were more accurate in predicting whether they could meet their drinking goal (Pachman

et al., 1978). Subsequent longitudinal studies comparing those who adopted a non-abstinence drinking goal and those who adopted abstinence as a drinking goal found there was little difference between these two groups in mean daily alcohol consumption or in the length of drinking problem (Adamson & Sellman, 2001; Booth et al., 1984).

The literature examining abstinence as a drinking goal has several limitations. The timeframe of post-treatment follow-up under analysis varies from 4 weeks to 6 months, a relatively short length of time. The available data is inconclusive about whether the goal of abstinence produces the same or different alcohol-use outcomes following treatment compared to a goal of non-abstinence. Furthermore, even in treatment settings where abstinence is encouraged, many clients adopt non-abstinence drinking goals and do not achieve total abstinence (Hall et al., 1990). Finally, not all studies of drinking goals are from the United States, where the vast majority of treatment centers advocate abstinence and only abstinence (Fuller & Hiller-Sturmhofel, 1999; Cox et al., 2004; Rosenberg and Davis, 1994). Results from other countries may not generalize to understanding associations with drinking goals in places where abstinence is the primary goal of treatment (such as in the United States) (Cox et al., 2004; Rosenberg & Davis, 1994). A clear and concise approach to examining alcohol use between individuals who adopt abstinence and individuals who adopt a non-abstinence drinking goal is needed.

Current directions of research in drinking goals and alcohol use

In addition to interest in how drinking goals are associated with alcohol use over time, demographic and clinical characteristics of those who are most likely to desire abstinence as a treatment goal is also of interest. Abstinence is more likely to be a drinking goal among men, those who are employed, those who are highly educated, and racial or ethnic minorities

(Adamson & Sellman, 2001; Booth et al., 1984; Heather et al., 2010; Pachman et al., 1978). However, these results are derived from studies composed of small samples or from outside of the United States, where abstinence-based treatment approaches are less dominant (Cox et al., 2004; Rosenberg and Davis, 1994). Additionally, the long-term impact of abstinence as a drinking goal at treatment initiation on longitudinal alcohol use patterns is not known. To extend the research on drinking goals at treatment entry and its relationship to subsequent alcohol use, this analysis examines data from the Life Transitions Study (LTS) (Robinson et al., 2011), a 3-year longitudinal panel study originally designed to examine the relationship between spirituality, Alcoholics Anonymous participation, and drinking outcomes.

Method

Sample

Data from the LTS (Robinson et al., 2011) were examined in a secondary analysis. The LTS is a longitudinal study of 364 adults who met DSM-IV criteria for alcohol dependence who were drawn from treatment and non-treatment sources. For this analysis, 93 LTS participants who were not in treatment were dropped, given the current study's interest in abstinence as a drinking goal upon treatment entry. This left a final sample size of 271 alcohol-dependent adults who were in treatment for alcohol dependence at their baseline interview. Participants were recruited from three sites: 1) a university-affiliated outpatient addiction treatment program (n=157), 2) a VA outpatient substance use treatment clinic (n=80), and 3) a drinking program which helped individuals to reduce, but not to stop, their drinking (n=34). Both the university affiliated outpatient program and the VA outpatient treatment clinic adhere to classic, abstinence-based treatment models. All study procedures were approved by the appropriate IRB committees.

Participants completed in-person interviews every 6 months for 2.5 years (see Robinson et al., 2011, for additional details). At baseline, all participants met criteria for alcohol dependence as measured by the Structured Clinical Interview for *DSM-IV* (SCID) (First & Gibbon, 1997); had at least one drink in the 90 days prior to baseline; were aged 18 or older; had no evidence of current psychosis, suicidality, or homicidality; and were literate in English. All participants entered the study after they had been in treatment for 1 week, but not more than 4 weeks.

Measures

Sociodemographic characteristics. At baseline, participants were asked to report their age, gender, race/ethnicity, and number of years of education. Due to small numbers of some ethnic groups, race/ethnicity was recoded to three groups -- White, Black/African American, and Other.

Clinical characteristics. At baseline, participants were asked yes/no questions about whether they had any previous experience with Alcoholics Anonymous (AA) and a family history of alcohol problems. Additionally, participants were asked at what age their alcohol problems began. Finally, participants were asked to complete the Short Inventory of Problems (SIP) (Miller & Tonigan, 1995), a 15-item measure of the negative consequences of drinking ($\alpha = .91$).

Abstinence as a drinking goal. At study entry, participants were asked if they wanted to be abstinent. Responses options to this question were 4 categories: “yes,” “no,” “maybe,” and “don’t know.” Participants who responded with “maybe” and “don’t know” were re-coded to a “no” response based on analyses that showed no significant differences in sociodemographic and

clinical characteristics between these those who responded “maybe,” “don’t know,” or “no” to the question of whether they wanted to be abstinent.

Alcohol use. At each of the 6 waves of data collection, data on alcohol use was obtained with the Timeline Follow-Back (TLFB; Sobell & Sobell, 1992), which yielded data on alcohol use in the last 90 days including Percent Days Abstinent, Percent Heavy Drinking Days, and Days Since Last Drink.

Analysis plan

Bivariate analyses examined who was most likely to endorse abstinence as a drinking goal at baseline. To understand how abstinence as a drinking goal at baseline influenced subsequent alcohol use, multilevel mixed-effects linear regression models were constructed to examine change in alcohol use patterns over a 2.5-year time period, as measured by the TLFB. These statistical models account for correlated data that results from repeated observations upon the same individuals, and adjust p values accordingly (Bryk & Raudenbush, 1992). These p value calculations are based upon the calculated standard error. In a multilevel modeling strategy, the standard error contains two components, level 1 and level 2 components. This more complex standard error accounts for the multilevel nature of the data including variance components for both change in participants over time as well as participants in each wave of data.

The use of multilevel models for examining the time trajectories of different outcomes merits some discussion. Multilevel models offer insight into longitudinal data analysis that extends beyond statistical analyses such as basic repeated measures designs. Multilevel models offer an opportunity to examine not only whether there is variability in individuals over time, but also whether there is variability in where individuals begin. In a traditional Hierarchical Linear

Modeling strategy these are known as level 1 and level 2 effects, respectively (Bryk & Raudenbush, 1992). Employing a multilevel modeling framework, level 1 and level 2 effects can be examined from a longitudinal standpoint, distinct groups of individuals (here I examine drinking goals) can be examined to answer 1) Is there a difference in where these groups begin (model intercept), and 2) over time, do these groups have a distinct patterns in terms of dependent variables (model slope)? This approach to examining longitudinal data is consistent with previously established approaches (Singer, 1998; Singer & Willett, 2003; Willett et al, 1998).

In the statistical models for this research project, a random effect is included for drinking goal at treatment entry, suggesting that the goals an individual formulates in early treatment entry may play a substantial role in later trajectories of alcohol use. In multilevel modeling in general, and in Stata in particular, I am able to employ a likelihood ratio test to determine whether a multilevel modeling approach offers improvement over a simpler OLS. Results of this likelihood ratio test indicate that there is benefit (in terms of fit) from treating the intercept as random. Additionally, I included a fixed main effect for having an abstinence goal and for other covariates of interest. An examination of the main effect as a random effect did not significantly change the predicted values of the model, suggesting the use of a random main effect was appropriate.

I also included a set of indicator variables for time, intended to estimate alcohol use patterns for the contrast group (individuals who did not desire abstinence). Lastly, I included an interaction of having an abstinence goal with the indicator variables for time, to examine whether or not those with an abstinence goal had a different time trajectory than those who did not. All analyses were completed in STATA Version 12 (StataCorp, 2011).

Finally, all models presented are linear where dependent variables are considered as continuous measures. Percent days abstinent and percent heavy drinking days are measured as percentages, and are thus bounded by 0.0 and 1.0. To examine whether all dependent variables could be appropriately estimated with a linear multilevel model, results from censored (tobit) multilevel models were compared to linear models. Censored models showed no differences in the size or significance of model coefficients compared to the linear models presented.

Results

Sociodemographic and clinical characteristics of the sample are presented in Table 4.1. At baseline, 80.1% of the sample desired abstinence as a drinking goal. The mean age of the sample was 44.6 years. Over 68% of the sample was male and a majority were White. The mean level of education was 14.4 years. Seventy-six percent of the sample reported prior experience with Alcoholics Anonymous (AA), slightly more than 87% reported a family history associated with alcohol problems, and the average age of onset of alcohol dependence for the sample was 29.5 years

Table 4.2 presents the 3 dependent measures separately for individuals who desire abstinence as a drinking goal and those who desire a non-abstinence drinking goal at baseline (Wave 1). Across all dependent measures, a general trend is shown, regardless of drinking goal, of increased percent days abstinent, lowered percentage of heavy drinking days, and increased days since last drink at 2.5 year follow-up (Wave 6) compared to baseline.

Who is most likely to desire abstinence at treatment entry?

Table 4.1 shows the bivariate analyses of the sample examining who was more likely to desire abstinence as a drinking goal at baseline. The column titled “ χ^2 or F” indicates the significance of the differences between groups. The analyses showed that 91.2% of participants

from the VA treatment program desired abstinence as a drinking goal, while 83.4% of respondents from the University outpatient site and only 38.2% from the moderated drinking program desired abstinence as a drinking goal, $\chi^2(2, N = 271) = 44.7, p < .01$. Additionally, 85.9% of men desired abstinence as a drinking goal compared to 67.4% of women, $\chi^2(1, N = 271) = 12.6, p < .01$. Furthermore, 100% of Black/African Americans and 92.9% of participants in the “other” racial/ethnic category desired abstinence as a drinking goal at baseline, while only 77.8% of White participants reported a desire for abstinence as a drinking goal at baseline, $\chi^2(2, N = 271) = 6.7, p < .01$. There were no differences in age or education between participants who desired abstinence as a drinking goal and participants who did not.

In terms of clinical characteristics, 83.4% of the respondents who had previous experience with AA desired abstinence as a drinking goal at baseline, while only 50% of participants with no previous experience with AA desired abstinence as a drinking goal, $\chi^2(1, N = 271) = 27.1, p < .01$. Finally, participants who desired abstinence as a drinking goal reported more alcohol-related problems (as assessed by the SIP) than participants who did not desire abstinence as a drinking goal $F(1,271) 18.9, p < .01$. There were no differences associated with family history or age of alcohol dependence onset between participants who desired abstinence as a drinking goal and participants who did not.

Does abstinence as a drinking goal at treatment entry influence alcohol use over time?

In order to examine longitudinal results, multilevel mixed-effects linear regression models examined the relationship between abstinence as a drinking goal at baseline and change in alcohol use patterns over 2.5 years. The dependent variables measuring alcohol use were Percent Days Abstinent, Percent Heavy Drinking days, and Days Since Last Drink. All regression models controlled for sociodemographic variables (treatment site, age, gender,

race/ethnicity, and education) and clinical variables (previous experience with AA, family history, age of onset, and SIP score).

The multilevel models are presented in Table 4.3 and warrant brief discussion. Table 4.3 presents a longitudinal analysis of 3 dependent variables examining (1) whether participants who desire abstinence are significantly different from participants with a non-abstinence goal at the model intercept (desire for abstinence), (2) the predicted values in the dependent variable for participants with a non-abstinence goal (Wave), and (3) the predicted values for participants who desire an abstinence goal either above or below participants with a non-abstinence goal (Desire for abstinenceXWave).

The first model examined Percent Days Abstinent (PDA) over time. Controlling for sociodemographic and clinical factors, this model shows participants who desire abstinence are not significantly different from participants with a non-abstinence goal at the model intercept in terms of PDA. However, regression modeling indicated that individuals with abstinence as a drinking goal showed significantly increased PDA compared to participants with non-abstinence as a drinking goal at wave 2 ($\beta = 9.31$, $SE = 4.22$), and most notably in later waves up to 2.5 years following treatment entry, including Wave 5 ($\beta = 9.96$, $SE = 4.33$) and Wave 6 ($\beta = 12.93$, $SE = 4.38$).

The result that individuals with abstinence as a drinking goal showed significantly increased PDA compared to participants with non-abstinence as a drinking goal at wave 6 is interpreted as follows: the change in percent days abstinent between wave 1 (statistical reference group) and wave 6 for individuals with abstinence as a drinking goal is 12.93 days higher than the change in percent days abstinent between wave 1 and wave 6 for individuals with a non-abstinence drinking goal.

Among our control variables, participants from the moderated drinking program had significantly fewer PDA compared to participants from the university outpatient program at baseline ($\beta = -27.59$, $SE = 3.86$). Participants with higher education had significantly fewer PDA at baseline ($\beta = -1.01$, $SE = 0.51$) and participants with a younger age of onset had significantly fewer PDA at baseline ($\beta = -0.26$, $SE = 0.11$). No other associations were found with PDA.

The second model examined percent Heavy Drinking Days (HDD) over time. Controlling for sociodemographic and clinical factors, this model shows participants who desire abstinence are not significantly different from participants with a non-abstinence goal at the model intercept in terms of HDD. However, regression modeling showed participants with abstinence as a drinking goal showed significantly lower HDD compared to participants with non-abstinence as a drinking goal at Wave 2 ($\beta = -8.13$, $SE = 3.98$). No differences emerged in HDD between participants with abstinence as a drinking goal and participants with non-abstinence as a drinking goal at subsequent waves. However, among our control variables, individuals in the moderated drinking program showed significantly increased HDD compared to individuals from the university outpatient program at baseline ($\beta = 6.41$, $SE = 2.99$). Additionally, having a family history associated with alcohol abuse/dependence was related to increased HDD at baseline ($\beta = 4.99$, $SE = 2.55$), an older age of onset was related to increased HDD at baseline ($\beta = 0.24$, $SE = 0.08$), and higher numbers of drinking consequences (SIP) were related to increased HDD at baseline ($\beta = 0.23$, $SE = 0.08$). No other associations were found with HDD.

Finally, the third model examined Days Since Last Drink (DLD). Controlling for sociodemographic and clinical factors, results showed that participants who desire abstinence are not significantly different from participants with a non-abstinence goal at the model intercept in terms of DLD. Further, regression modeling showed no significant difference in DLD between

participants with abstinence as a drinking goal and participants with non-abstinence as a drinking goal at Wave 2. However, in later waves up to 2.5 years following treatment entry, participants with abstinence as a drinking goal showed significantly more DLD compared to participants with non-abstinence as a drinking goal at Wave 3 ($\beta = 116.92$, $SE = 38.67$), Wave 4 ($\beta = 161.64$, $SE = 38.84$), Wave 5 ($\beta = 202.57$, $SE = 39.13$), and Wave 6 ($\beta = 256.25$, $SE = 39.66$). Among our control variables, participants from the moderated drinking program had significantly fewer DLD compared to participants from the university outpatient program at baseline ($\beta = -57.23$, $SE = 28.34$). Participants from the VA treatment program had significantly more DLD compared to participants from the university outpatient program at baseline ($\beta = 145.32$, $SE = 38.23$). Last, older age was significantly related to more DLD at baseline ($\beta = 4.12$, $SE = 1.09$). No other associations were found with DLD.

Discussion

When examining drinking goals at treatment entry, it is worth noting that not all participants from classic, abstinence-based treatment models (in this study, the university-affiliated outpatient addiction treatment program and the VA outpatient substance use treatment clinic) desired abstinence as a drinking goal, and not all participants from the moderated drinking program desired non-abstinence as a drinking goal. Slightly over 38% of participants from the moderated drinking program desired a goal of abstinence and between 8% and 16% of participants from the abstinence-based treatment program desired a non-abstinence drinking goal.

Further, the results showed individuals from the VA clinic, individuals who were male, individuals who were racial or ethnic minorities, individuals with previous experience with AA, and individuals with more negative experiences associated with alcohol use (as indicated by

higher SIP scores) were those most likely to desire abstinence as a drinking goal. These results are supported by previous research showing that men, racial/ethnic minorities and those with more alcohol-related support/treatment experience are most likely to adopt abstinence as a drinking goal (Adamson & Sellman, 2001; Booth et al., 1984; Heather et al., 2010; Pachman et al., 1978). These results demonstrate a similar pattern of findings with studies conducted on drinking goals in other countries where alternatives to abstinence are also legitimate goals of treatment (such as in European regions), offering generalizability to the known differences between individuals who desire abstinence as a drinking goal and individuals who desire a non-abstinence drinking goal at treatment entry.

Additionally, when examining drinking goals upon treatment entry and alcohol use following treatment, these results demonstrate that when controlling for sociodemographic, clinical, and treatment site characteristics, no differences emerge between individuals who desire a drinking goal of abstinence and individuals with a non-abstinence drinking goal at treatment entry. However, over time these results show that individuals who desire a drinking goal of abstinence at treatment entry reported increased percent days abstinent and more days since last alcohol use over time for 2.5 years following treatment entry compared to individuals with a non-abstinence drinking goal at treatment entry. This effect also emerged for a third longitudinal variable related to alcohol use, percent of heavy drinking days, but only at the second wave. No effect of drinking goal at treatment entry emerged for percent heavy drinking days at subsequent waves. This finding suggests that abstinence as a drinking goal at treatment entry may not have universal effects on alcohol use, when alcohol use is conceptualized as a multidimensional outcome of treatment (Heather & Tebbutt, 1989).

These results extend previous research that had shown differences in alcohol use following treatment between individuals who adopt a drinking goal of abstinence and individuals who adopt a non-abstinence drinking goal at treatment entry by expanding the time frame for longitudinal analysis of alcohol use out to 2.5 years following treatment entry. The results suggest that individuals who desire a drinking goal of abstinence at treatment entry experience a sustained change in alcohol use that lasts well beyond treatment completion – up to two and a half years following treatment entry, compared to individuals who adopt a non-abstinence drinking goal.

Limitations

Responses to the question of abstinence as a drinking goal were recoded to combine those who replied “no,” “maybe,” or “don’t know” into one group based on a lack of differences in the demographic and clinical measures included in the analyses presented. Furthermore, at each wave, many individuals who desired abstinence as a drinking goal continued to report some, but low levels, of alcohol use rather than total abstinence. These analyses do not examine whether drinking goals at treatment entry were met at each wave. Future research in the area of drinking goals may be substantially enhanced through examining both goal formation and whether these goals are met through the treatment process and following treatment completion.

Conclusions

With these limitations in mind, these results can provide clinicians with an understanding of the characteristics of individuals who are most likely to adopt a drinking goal of abstinence at treatment entry, and the consequences of treatment-entry drinking goals on subsequent alcohol use. While the self-selection of drinking goals upon treatment entry has become more prevalent in the U.S. among individuals seeking treatment for alcohol dependence, understanding who is

most likely to desire specific drinking goals, such as abstinence, can assist clinicians in anticipating drinking outcomes based on goals set early in a treatment episode. It is a common practice for clinicians to ask about motivation for abstinence. By understanding sociodemographic and clinical characteristics associated with answers to this question (whether a drinking goal of abstinence or a non-abstinence drinking goal is preferred), clinicians can successfully navigate responses to difficult questions concerning alcohol use at a point in treatment when the formation of positive client-clinician alliance is critical (Connors et al., 2000).

Last, by understanding the benefits and risks associated with a self-selected goal such as abstinence, clinicians can increase attention to individuals who adopt goals involving higher levels of alcohol consumption, such as a non-abstinent treatment goal. These results show that individuals who desire abstinence as a drinking goal at treatment entry consume less alcohol 2.5 years following treatment compared to individuals who desire a non-abstinent drinking goal. This finding may suggest that alcohol-dependent adults who desire a non-abstinent drinking goal may be at higher risk for continued problematic drinking. However, with the large base of evidence supporting the effectiveness of motivational interviewing strategies in the treatment of alcohol dependent adults (Treasure, 2004), therapeutic strategies designed to resolve ambivalence and activate motivational processes within the individual to facilitate a change in alcohol use may be helpful in strengthening motivation for change among individuals who desire a non-abstinent drinking strategy upon treatment entry.

Table 4.1. Sample characteristics and bivariate associations with desire for abstinence

N = 271	M or %	Abstinence Yes % or M	Abstinence No % or M	χ^2 or F
Abstinence as a drinking goal	80.1%	-	-	-
Site				
University outpatient	57.9%	83.4%	16.6%	44.7**
VA treatment program	29.5%	91.2%	8.8%	
Moderated drinking program	12.6%	38.2%	61.8%	
Age	44.6	45.1	42.9	1.06
Gender				
Male	68.2%	85.9%	14.1%	12.6**
Female	31.7%	67.4%	32.5%	
Race/ethnicity				
White	88.2%	77.8%	22.2%	6.7*
Black	6.6%	100%	0%	
Other	5.2%	92.9%	7.1%	
Education (in years)	14.4	14.2	14.9	1.34
Previous experience with AA	76.8%	87.2%	12.9%	27.1**
Family history	87.1%	80.1%	19.9%	0.5
Age of alcohol dependence onset	29.5	29.5	29.4	0.1
Short Inventory of Problems ¹	21.2	22.6	15.5	18.9**

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

¹ Miller & Tonnigan, 1995. The SIP is a 15-item measure about negative consequences of drinking. $\alpha = .91$

Table 4.2. Abstinence goal and alcohol use variables

N = 271	Wave 1 % (M)	Wave 2 % (M)	Wave 3 % (M)	Wave 4 % (M)	Wave 5 % (M)	Wave 6 % (M)
Percent days abstinent ¹						
Abstinence Yes	61.89	90.17	88.64	89.21	85.53	88.01
Abstinence No	52.85	71.72	75.42	74.44	65.37	65.29
Percent heavy drinking days ¹						
Abstinence Yes	31.28	5.74	8.21	6.41	7.79	6.28
Abstinence No	29.75	12.66	11.11	9.85	12.14	12.30
Days since last drink ²						
Abstinence Yes	(35.32)	(132.15)	(204.24)	(305.29)	(369.54)	(443.69)
Abstinence No	(19.46)	(39.72)	(71.61)	(124.97)	(149.16)	(164.79)

¹ Measured as a percent of past 90 days

² Measured since study entrance

Time between each wave is 6 months

Table 4.3. Longitudinal model of days abstinent, heavy drinking days and days since last drink as a function of desire for abstinence

N = 271	Percent Days Abstinent		Heavy Drinking Days		Days since Last Drink	
	β	SE	β	SE	β	SE
Desire for abstinence	1.18	3.89	1.58	3.27	-23.20	37.14
Wave						
Wave 1	-	-	-	-	-	-
Wave 2	18.55**	3.78	-16.72**	3.48	18.48**	34.13
Wave 3	20.48**	3.83	-18.32**	3.53	46.32**	34.57
Wave 4	20.34**	3.83	-19.08**	3.53	101.80**	34.59
Wave 5	13.33**	3.86	-17.86**	3.56	125.94**	34.85
Wave 6	13.22**	3.88	-17.99**	3.58	143.77**	35.07
Desire for abstinenceXwave						
Wave 1	-	-	-	-	-	-
Wave 2	9.31*	4.22	-8.13*	3.89	72.33	38.11
Wave 3	5.94	4.28	-4.03	3.95	116.92**	38.67
Wave 4	6.44	4.29	-4.98	3.96	161.64**	38.84
Wave 5	9.96*	4.33	-5.06	3.99	202.57**	39.13
Wave 6	12.93**	4.38	6.26	4.03	256.25**	39.66
Site						
University outpatient	-	-	-	-	-	-
VA treatment program	-0.09	2.87	0.79	2.23	145.32**	28.34
Moderated drinking program	-25.79**	3.86	6.41*	2.99	-57.23*	38.23
Age	0.09	0.11	-0.17	0.09	4.12**	1.09
Gender						
Male	1.52	2.59	-1.87	2.01	18.38	25.65
Female	-	-	-	-	-	-
Race						
White	-	-	-	-	-	-
Black	1.72	4.45	2.16	3.45	9.22	44.01
Other	-1.98	6.37	1.88	4.94	-109.68	62.94
Education (in years)	-1.01*	0.51	0.14	0.39	1.39	5.40
Previous experience with AA	1.05	2.99	1.18	2.32	-0.28	29.48
Family history	-1.49	3.29	4.99*	2.55	12.17	32.45
Age of alcohol dependence onset	-0.26*	0.11	0.24**	0.08	-1.44	1.08
Short inventory of problems	-0.16	0.09	0.23**	0.08	0.78	0.98

* p<.05, **p<.01. Time between each wave is 6 months

¹ Miller & Tonigan, 1995. The SIP is a 15-item measure about negative consequences of drinking, $\alpha = .91$

References

- Adamson, S. J., Heather, N., Morton, V., & Raistrick, D. (2010). Initial Preference for Drinking Goal in the Treatment of Alcohol Problems: II. Treatment Outcomes. *Alcohol and Alcoholism*, 45(2), 136–142.
- Adamson, S. J., & Sellman, J. D. (2001). Drinking goal selection and treatment outcome in outpatients with mild-moderate alcohol dependence. *Drug and Alcohol Review*, 20(4), 351–359.
- Bandura, A. (1986). The Explanatory and Predictive Scope of Self-Efficacy Theory. *Journal of Social and Clinical Psychology*, 4(3), 359–373.
- Booth, P. G., Dale, B., & Ansari, J. (1984). Problem drinkers' goal choice and treatment outcome: A preliminary study. *Addictive Behaviors*, 9(4), 357–364.
- Brehm, S. S., & Brehm, J. W. (1981). *Psychological reactance*. New York: Academic Press.
- Coldwell, B., & Heather, N. (2006). Introduction to the special issue. *Addiction Research and Theory*, 14(1), 1–5.
- Connors, G. J., DiClemente, C. C., Dermen, K. H., Kadden, R., Carroll, K. M., & Frone, M. R. (2000). Predicting the therapeutic alliance in alcoholism treatment. *Journal of Studies on Alcohol and Drugs*, 61(1), 139–149.
- Cox, W. M., Rosenberg, H., Hodgins, C. H. A., Macartney, J. I., & Maurer, K. A. (2004). United Kingdom and United States Healthcare Providers' Recommendations of Abstinence Versus Controlled Drinking. *Alcohol and Alcoholism*, 39(2), 130–134.
- Dawson, D. A., Grant, B. F., Stinson, F. S., & Chou, P. S. (2006). Estimating the effect of help-seeking on achieving recovery from alcohol dependence. *Addiction*, 101(6), 824–834.
- Deci, E. L., & Ryan, R. M. (1985). *Intrinsic Motivation and Self-Determination in Human Behavior*. Springer.
- DiClemente, C. C. (2007). Mechanisms, Determinants and Processes of Change in the Modification of Drinking Behavior. *Alcoholism: Clinical and Experimental Research*, 31(3), 13–20.
- First, M. B., & Gibbon, M. (1997). *User's Guide for the Structured Clinical Interview for Dsm-IV Axis II Personality Disorders: Scid-II*. American Psychiatric Publications.
- Foy, D. W., Rychtarik, R. G., O'Brien, T. P., & Nunn, L. B. (1979). Goal Choice of Alcoholics: Effects of Training Controlled Drinking Skills. *Behavioural and Cognitive Psychotherapy*, 7(04), 101–110.
- Fuller, R.K. & Hiller-Sturmhofel, S. (1999). Alcoholism treatment in the United States: An overview. *Alcohol Research and Health*, 23(2), 69-77.
- Grant, B. F., Dawson, D. A., Stinson, F. S., Chou, S. P., Dufour, M. C., & Pickering, R. P. (2004). The 12-month prevalence and trends in DSM-IV alcohol abuse and dependence: United States, 1991–1992 and 2001–2002. *Drug and Alcohol Dependence* 74(3), 223–234.
- Hall, S. M., Havassy, B. E., & Wasserman, D. A. (1990). Commitment to abstinence and acute stress in relapse to alcohol, opiates, and nicotine. *Journal of Consulting and Clinical Psychology*, 58(2), 175–181.
- Harwood, H. J., Fountain, D., & Livermore, G. (1998). Economic Costs of Alcohol Abuse and Alcoholism. *Recent Developments in Alcoholism*, 14, 307–330.
- Hasin, D. S., Stinson, F. S., Ogburn, E., & Grant, B. F. (2007). Prevalence, Correlates, Disability, and Comorbidity of DSM-IV Alcohol Abuse and Dependence in the United

- States: Results From the National Epidemiologic Survey on Alcohol and Related Conditions. *Archives of General Psychiatry*, 64(7), 830–842.
- Heather, N., Adamson, S. J., Raistrick, D., & Slegg, G. P. (2010). Initial Preference for Drinking Goal in the Treatment of Alcohol Problems: I. Baseline Differences Between Abstinence and Non-Abstinence Groups. *Alcohol and Alcoholism*, 45(2), 128–135.
- Heather, N., & Tebbutt, J. (1989). Definitions of non-abstinent and abstinent categories in alcoholism treatment outcome classifications: a review and proposal. *Drug and Alcohol Dependence*, 24(2), 83–93.
- Kopelman, M. D., Thomson, A. D., Guerrini, I., & Marshall, E. J. (2009). The Korsakoff Syndrome: Clinical Aspects, Psychology and Treatment. *Alcohol and Alcoholism*, 44(2), 148–154.
- Longabaugh, R., Donovan, D. M., Karno, M. P., McCrady, B. S., Morgenstern, J., & Tonigan, J. S. (2006). Active Ingredients: How and Why Evidence-Based Alcohol Behavioral Treatment Interventions Work. *Alcoholism: Clinical and Experimental Research*, 29(2), 235–247.
- Luke, D. A. (2004). *Multilevel Modeling*. Sage: Thousand Oaks, CA.
- Maisto, S. A., Pollock, N. K., Cornelius, J. R., Lynch, K. G., & Martin, C. S. (2003). Alcohol relapse as a function of relapse definition in a clinical sample of adolescents. *Addictive Behaviors*, 28(3), 449–459.
- Marlatt, G. A. (1983). The controlled-drinking controversy: A commentary. *American Psychologist*, 38(10), 1097–1110.
- Miller, W.R., & Tonigan, J.S. (1995). *The Drinker Inventory of Consequences (DrInC): An instrument for assessing adverse consequences of alcohol abuse. Project MATCH Monograph Series, Vol. 4. DHHS Publication No. 95-3911*. Rockville MD: NIAAA.
- Moos, R. H., & Moos, B. S. (2006). Rates and predictors of relapse after natural and treated remission from alcohol use disorders. *Addiction*, 101(2), 212–222.
- Moyer, A., Finney, J. W., Swearingen, C. E., & Vergun, P. (2002). Brief interventions for alcohol problems: a meta-analytic review of controlled investigations in treatment-seeking and non-treatment-seeking populations. *Addiction*, 97(3), 279–292.
- Pachman, J. S., Foy, D. W., & Van Erd, M. (1978). Goal choice of alcoholics: a comparison of those who choose total abstinence vs. those who choose responsible, controlled drinking. *Journal of Clinical Psychology*, 34(3), 781–783.
- Raudenbush, S. W., & Bryk, A. S. (2002). *Hierarchical linear models: Applications and data analysis methods*. Thousand Oaks, CA: Sage Publications.
- Rehm, J., Mathers, C., Popova, S., Thavorncharoensap, M., Teerawattananon, Y., & Patra, J. (2009). Global burden of disease and injury and economic cost attributable to alcohol use and alcohol-use disorders. *Lancet*, 373(9682), 2223–2233.
- Robinson, E. A. R., Krentzman, A. R., Webb, J. R., & Brower, K. J. (2011). Six-month changes in spirituality and religiousness in alcoholics predict drinking outcomes at nine months. *Journal of Studies on Alcohol and Drugs*, 72(4), 660–668.
- Roizen, R. (1987). The great controlled-drinking controversy. *Recent Developments in Alcoholism*, 5, 245–279.
- Rosenberg, H., & Davis, L.-A. (1994). Acceptance of moderate drinking by alcohol treatment services in the United States. *Journal of Studies on Alcohol and Drugs*, 55(2), 167–172.

- Singer, J. (1998). Using SAS PROC MIXED to fit multilevel models, hierarchical models, and individual growth models. *Journal of Educational and Behavioral Statistics*, 24(4), 323-355.
- Singer, J. D., & Willett, J. B. (2003). *Applied longitudinal data analysis: Modeling change and event occurrence*. New York : Oxford University Press.
- Sobell, M. B., & Sobell, L. C. (1995). Controlled drinking after 25 years: How important was the great debate? *Addiction*, 90(9), 1149–1153.
- Sobell, L.C., & Sobell, M.B. (1992). Timeline follow back: A technique for assessing self-reported alcohol consumption. In Raye Z. Litten & John P. Allen (Eds.), *Measuring Alcohol Consumption: Psychosocial and Biochemical Methods*. Totowa: Humana Press.
- StataCorp. (2011). *Stata Statistical Software: Release 12*. College Station, TX: StataCorp LP.
- Treasure, J. (2004). Motivational Interviewing. *Advances in Psychiatric Treatment*, 10(5), 331–337.
- Whitford, J. L., Widner, S. C., Mellick, D., & Elkins, R. L. (2009). Self-Report of Drinking Compared to Objective Markers of Alcohol Consumption. *American Journal of Drug and Alcohol Abuse.*, 35(2), 55–58.
- Willett, J. B., Singer, J. D., & Martin, N. C. (1998). The design and analysis of longitudinal studies of development and psychopathology in context: Statistical models and methodological recommendations. *Developmental Psychopathology*, 10(2), 395-426.

Chapter 5: Summary and future directions

While an estimated 9.7 million Americans experience alcohol abuse and 7.9 million experience alcohol-dependence in the past year (Grant et al., 2004). Additionally, only about 28% of individuals suffering from alcohol use disorders seek help for their problems (Cohen, Feinn, Arias, & Kranzler, 2007). This finding has created a need among social workers and psychologists to better understand factors related to treatment use for alcohol dependence. While several policy initiatives are directed towards understanding these factors (USDHHS, 2010b), there are still considerable research gaps in how and why individuals seek out treatment for alcohol dependence, and whether interventions can be created to address the lack of treatment use for alcohol dependence (USDHHS, 2010a). Recent research has suggested that social network ties may reveal important keys to how persons experiencing health problems, such as alcohol use disorders, adopt strategies to promote health and well-being including the use of treatment for alcohol dependence, but these findings often produce conflicting findings, leaving the role of social network ties in the decision to seek treatment uncertain. On the one hand, network ties can assist in the treatment initiation process. Yet on the other hand, network ties can serve as a treatment substitute, or worse, steer an individual away from treatment through promoting stigma for mental health or substance abuse problems (Pescosolido, Gardner, & Lubell, 1998).

Additionally, of those who enter and complete treatment, approximately 60% will relapse to some drinking within the first year following alcohol treatment (Maisto, Pollock, Cornelius, Lynch, & Martin, 2003; Whitford, Widner, Mellick, & Elkins, 2009). With these findings in

mind, current research on outcomes associated with treatments for alcohol dependence examines mechanisms of change associated with reduced alcohol use (Longabaugh et al., 2006). However, goals that individuals form in the early treatment process has often been implicated as a mechanism of change for reduced alcohol use, yet this claim has yet to be formally tested.

Improving treatment entry for alcohol dependence and positive outcomes associated with treatment for alcohol dependence is of concern for social workers and psychologists. The mission of social work and psychology is to improve the lives of people, especially those in need (American Psychological Association, 2011; National Association of Social Workers, 2011), and arguably, individuals with alcohol dependence are in need.

However, before specific interventions can be designed to improve the use of treatment services for alcohol dependence, additional information is needed concerning the psychosocial factors, such as social network ties, that influence the decision to seek treatment. We need to know what the social network ties of individuals with alcohol dependence, as well as alcohol abuse, look like, compared to the general population. Additionally, we need to know under what conditions social network ties influence individuals to seek out treatment, and in what conditions they do not. Furthermore, to improve the outcomes associated with treatment use for alcohol dependence, we need to know which factors in the early treatment process are key points for understanding how positive treatment outcomes are achieved. This three-paper dissertation was designed to answer these questions.

Gaining a better understanding of how social network ties promote treatment use among individuals with alcohol dependence as well as how factors, such as goal-setting, promote positive outcomes for treatment use among individuals with alcohol dependence can serve to increase the knowledge base among individuals who work with this population. However, the

findings associated from this dissertation work also have implications for social work practice and future research in this area.

Chapter 2: Alcohol use disorders and diminished social network ties: Findings from the NESARC

The results from chapter 2 show that overall, social network ties, measured in terms of both diversity and size, tend to be smaller for those with lifetime alcohol abuse and alcohol dependence, compared to those with no lifetime alcohol use disorder. These findings are consistent with previous literature on this topic, suggesting that a lack of social network ties among individuals with an alcohol use disorder may present significant obstacles concerning accessing social support, receiving feedback about their drinking, and getting information concerning accessing treatment services when needed (Gourash, 1978; Kaskutas, Weisner, & Caetano, 1997).

However, the findings that social network ties are smaller and less diverse among those with an alcohol use disorder are not uniform. Those with lifetime alcohol dependence tend to have social network ties composed of students and co-workers at larger rates than those with lifetime alcohol abuse and those with no lifetime alcohol use disorder. Furthermore, those with lifetime alcohol abuse tend to have social network ties composed of spouses/partners, friends, students/teachers, co-workers, and others groups, at larger rates than those with no lifetime alcohol use disorder.

These findings suggest that interventions that harness social influence to reduce alcohol use may achieve greater effectiveness through targeting groups in social networks that are larger in size and more prevalent among individuals with alcohol use disorders. Interventions that attempt to reduce the social influence of alcohol abuse among college students have proven

effective (DeJong et al., 2006; Mattern & Neighbors, 2004; Perkins & Craig, 2006), and there is corroborating research to suggest that targeting the reduction of alcohol use in a social network of co-workers promotes abstinence among those who have sought treatment for AUDs (Gordon & Zrull, 1991). Also, efforts to re-integrate those with AUDs into the broader community may be best served by targeting the specific groups in a social network that are smaller in size among those with an AUD. These groups include neighbors, religious groups and volunteer groups.

Chapter 3: Social network ties and treatment for alcohol dependence

Chapter 3 results show that social network ties, as measured by social network diversity, play in the decision to seek treatment for alcohol dependence, but not uniformly. Results show that only about 12% of individuals with a past-year diagnosis of alcohol dependence seek treatment. Further, results show that individuals who consume more alcohol, men, individuals older in age, and individuals with a co-occurring past-year diagnosis of anxiety or major depression were more likely to seek treatment. Additionally, while no main effect of social network ties was found, an interaction between social network ties and level of alcohol consumption showed that a larger number of social network ties, paired with a high level of alcohol consumption can be highly influential in directing individuals towards seeking treatment. However, a lower number of social network ties, paired with a high level of alcohol consumption can be nearly non-influential in directing individuals to seek treatment,

These results support conclusions from previous work that many individuals wait until alcohol use is severe before they seek treatment (Booth, Yates, Petty, & Brown, 1991; Kaskutas et al., 1997). Furthermore, these results suggest that for an individual with a high level of alcohol consumption and few social network ties, less knowledge is provided concerning whether their drinking is, in fact, excessive as well as what to do about it (e.g. where to seek treatment for

alcohol dependence) (Gourash, 1978), resulting in a reduced probability of treatment use.

Finally, these findings suggest that individuals with a high level of alcohol consumption with few social network ties represent a high risk group not likely to seek treatment, that is in need of further examination.

Chapter 4: The effect of drinking goals at treatment entry on longitudinal alcohol use patterns among adults with alcohol dependence

Chapter 4 examined correlates of an abstinence-related goal at early treatment, and a longitudinal analysis examining whether the adoption of abstinence related drinking goals in early treatment reduces subsequent alcohol use up to 2.5 years following treatment entry. These results show that individuals from the Veterans Administration clinic, individuals who were male, individuals who were racial or ethnic minorities, individuals with previous experience with AA, and individuals with more negative experiences associated with alcohol use were those most likely to desire abstinence as a drinking goal. Additionally, when examining drinking goals upon treatment entry and alcohol use following treatment, results demonstrate that participants who desire a drinking goal of abstinence at treatment entry report increased percent days abstinent and more days since last alcohol use over time for 2.5 years following treatment entry compared to individuals with a non-abstinence drinking goal at treatment entry.

These results can provide clinicians with an understanding of the characteristics of individuals who are most likely to adopt a drinking goal of abstinence at treatment entry, and the consequences of treatment-entry drinking goals on subsequent alcohol use. Further, by understanding the benefits and risks associated with a self-selected goal, such as abstinence, clinicians can increase attention to individuals who adopt goals involving higher levels of alcohol consumption, such as a non-abstinent drinking strategy.

Limitations

Similar to existing work on social network ties and treatment use, associations in chapters 2 and 3 are identified using cross-sectional data and temporal precedence cannot be determined in the NESARC samples. There are also limitations in the social network measure included in this dissertation. In the NESARC, social network ties are measured through the Social Network Index (Cohen, Doyle, Skoner, Rabin, & Gwaltney, 1997). While this is considered a validated and acceptable measure of social networks (Brissette, Cohen, & Seeman, 2000), the measure suffers from two distinct limitations. First, the Social Network Index does not examine specific functions found within a social network. For example, it has been implicated that social network ties comprised of heavy alcohol users lead individuals to drink at higher levels than those with fewer numbers of heavy drinkers in their social network (Homish & Leonard, 2008), regardless of the number of social network ties present. Additionally, individuals in treatment for alcohol use disorders who have a high number of heavy drinkers in their social network ties experience an increased risk for relapse and diminished recovery potential (Manuel, McCrady, Epstein, Cook, & Tonigan, 2007). Unfortunately, there is no data available concerning the level of alcohol use present in the social network ties of NESARC respondents. Future research examining impacts of social network ties among individuals with an alcohol use disorder should begin exploring this dimension of social network ties.

Second, the Social Network Index examines the frequency of interaction respondents have with social network ties over the past 2 weeks. There is an assumption in the measure that social network ties are relatively stable entities – the network ties an individual interacts with in the past 2 weeks are similar to the network ties an individual interacts with in the past year as well. While there is scant amounts of data to support the claim that social network ties are

relatively stable (Morgan, Neal, & Carder, 1997), it is unclear whether these findings generalize to a population of adults with alcohol use disorders. On the one hand, research from a large population of elderly American adults suggests that 60-80% of an individual's core social network (comprised of children, close friends, and extended family) is stable through time (Morgan et al., 1997). However, there is additional evidence to suggest that as adolescents increase their alcohol use, they tend to seek out others similar in their level of use, possibly restructuring their social network ties to enable increased alcohol use (Knecht, Burk, Weesie, & Steglich, 2010). Unfortunately, longitudinal research that can address the question of the stability of social network ties is not currently available. Future research conducting longitudinal analyses of social network ties stability would substantially contribute to the literature on social network ties and alcohol use and alcohol treatment.

Additionally, chapter 4 examining drinking goals in early treatment also has two distinct limitations worth discussing. First, in chapter 4, open-ended responses to the question of abstinence as a drinking goal are recoded on the basis that early analyses showed no statistically significant differences between individuals who responded "no," "maybe," or "don't know" to the question of whether they desired abstinence as a drinking goal at treatment entry and demographic and clinical measures included in the analyses presented. Second, at each wave, many individuals who desired abstinence as a drinking goal continued to report (albeit low) alcohol use above total abstinence. The analyses presented in study 3 do not examine whether drinking goals at treatment entry were met at each wave.

With these limitations in mind, the work presented in this dissertation offers a new and substantive contribution to the literature on the social network ties of individuals with alcohol use disorder, how social network ties influence the decision to seek treatment for alcohol

dependence, and how goal formation in early treatment promotes reduced alcohol use following treatment completion. While these initial findings are promising, there are several additional questions remaining concerning social network ties and goal formation in early treatment of individuals with alcohol use disorder, which are potential areas for future research.

Future directions

Additional influence of social networks. Chapter 3 of this dissertation examines the influence that social network ties can play a moderating role in the decision to seek treatment for alcohol dependence. These findings suggest that they do indeed have an indirect influence in the decision to seek treatment. However, it is certain that this is not the only influence that social network ties have for individuals with alcohol dependence.

One particular question that I intend to examine in the future is “What other roles do social networks play in the onset, duration and remission of alcohol use disorders?” When examining onset of alcohol use disorders, the general finding from examining drinking behavior and adolescents suggest that selection effects of social network ties matter more. Most individuals begin drinking, then leave their old social network ties in favor of new social network ties composed of people who are drinkers, and these drinkers offer little influence in further drinking behavior (Bullers, Cooper, & Russell, 2001; Burk, van der Vorst, Kerr, & Stattin, 2012; Knecht et al., 2010). These findings suggest that there is little utility in examining how social network ties influence the onset, duration and remission of alcohol use disorders. However, there are additional bodies of work, which suggest network ties do matter in future alcohol use. For example, support from network ties for not drinking predicts individual motivation increase over time, which leads to reduced alcohol use 6 months after treatment (Hunter-Reel, McCrady, Hildebrandt, & Epstein, 2010).

Additional work from areas of research outside of social network ties suggests social network ties can play an important role in the onset, duration and remission of alcohol use disorders. For example, social support has been described as a mediator between the associations of social network ties and many measures of health and well-being (Cohen & Janicki-Deverts, 2009). Generally, individuals with a larger number of social network ties possess greater resources to call on when experiencing health-related problems, including alcohol dependence (Cohen, Gottlieb, & Underwood, 2000). The social support received from a social network contributes to several outcomes including the formation of normative health behaviors (Cassel, 1976) a sense of belonging and self-worth (Cohen & Wills, 1985; Thoits, 1983), and greater motivation to care for oneself (Cohen & Syme, 1985).

Among individuals with alcohol use disorders, social support offers several beneficial effects. Individuals who report higher levels of social support are more likely to receive treatment and are less likely to relapse after completing treatment (Bond, Kaskutas, & Weisner, 2003; Harold, 1983). Additionally, social support can reduce the frequency of alcohol use after treatment completion (Gordon & Zrull, 1991). Individuals with an alcohol use disorder involved in treatment often report more encouragement from others to seek help compared to those who do not seek treatment (George & Tucker, 1996). These findings on the nature of social support suggest that social network ties may interact with social support to serve as additional risk or protective factors, which may influence the onset, duration and remission of alcohol use disorders.

The relative importance of specific social networks. It is generally believed that the more network ties an individual has, the greater health outcomes they may possess, in terms of both

alcohol use and general mortality (Berkman & Syme, 1979). However, these findings may also suggest that not all social network ties are equally beneficial. It is likely that closer social network ties, such as those composed of family and close friends, may be more strongly predictive of individual behavior than more distant social network ties such as those from volunteer groups.

A recent literature review of the available evidence concerning social network ties and substance abuse suggests that across all social network ties, family norms (opposed to norms from friends) have a stronger relationship to substance use and recovery from multiple substances including alcohol (Galea, Nandi, & Vlahov, 2004), but a majority of the data examined is cross-sectional and does not offer insight into differences concerning substance use and substance abuse or dependence. To date, there is no coherent data available to examine the relative strength of different social network ties as they relate to onset of alcohol abuse or dependence, as well as whether treatment is sought.

Longitudinal patterns of treatment use for alcohol use disorders. While the results presented above offer promise in terms of understanding who may benefit most from interventions designed to increase social network ties, there are several key research questions that are still in need of answers concerning the relationship between social network ties and treatment use for alcohol dependence. One specific question in need of further examination concerns the longitudinal patterns of treatment use for mental health and substance use. Much of the research on treatment use for mental health and substance abuse examines single events, usually as a yes/no answer (sought treatment/didn't seek treatment) (Pescosolido et al., 1998). Admittedly, these results are no different. However, new ideas associated with understanding treatment use suggest that past treatment experiences play a significant role in current decisions

to seek help (Pescosolido, 1992; Pescosolido, 1991). It is likely that understanding the longitudinal patterns of treatment use can substantially inform our understanding of barriers and facilitators which can assist in policy initiatives intended to increase the number of individuals who seek help for alcohol use disorders.

Longitudinal changes in social network ties through treatment processes. A lingering question in the study of social network ties and treatment use for alcohol use disorders is “how do social networks of individuals change through treatment process”? For example, when examining not social network ties, but friendships among individuals in treatment for alcohol dependence, approximately half of all friendships were with drinkers at baseline, and among individuals experiencing sustained reduction in alcohol use, these decreases continue following treatment (Mohr, Aversa, Kenny & Del Boca, 2001). From this it seems to suggest that social network ties may change through the treatment process. However, the specifics of how they change, beyond the adoption of sober friends, remain unclear.

These specifics are of high importance, given that some research suggests that the drinking behavior of an individual’s social network ties strongly predicts individual alcohol use, and that alcohol consumption among network ties are more predictive of treatment success than encouragement from network ties to abstain (Groh, Jason Ferarri & Halpert, 2011). Additional evidence suggests that generally, social network ties increase through the treatment and recovery process for alcohol use disorders (Kaskutas, Bond, & Humphreys, 2002), and experiencing a decline in social network ties through treatment is related to more alcohol use and relapse than no decline or an increase in social network ties (Favazza & Thompson, 1984).

From the evidence, it is likely that the best treatment outcomes are among individuals with network ties that promote abstinence and consume low levels of alcohol. And this is

supported in the literature. Support from low alcohol use social network ties for abstinence leads to improved outcomes 2 years later, including more days abstinent, more social support, higher AA attendance, and better coping skills (Litt, Kadden, Kabela-Cormier, & Petry, 2009; Longabaugh, Wirtz, Zywiak, & O'Malley, 2010).

From the work concerning longitudinal change in networks through the treatment process, one particular challenge in understanding the influence of social networks is how does an individual with an alcohol use disorder enter treatment and shift to social network ties that emphasize abstinence and reduced alcohol use?

Social networks and their relation to goal formation for alcohol use

This dissertation has conceptualized social networks and goal formation as two distinct mechanisms that influence individual decisions concerning treatment entry and subsequent alcohol use following treatment. However, it is likely that social networks and goal formation may influence each other, providing a feedback loop that have ramifications for both treatment success and future alcohol use.

When uniting social networks and goal formation among individuals with alcohol-related problems, several important questions emerge. There is some evidence to suggest that social networks can assist in the formation of goals. Individuals in treatment who work to build a “sober network” show reduced relapse rates following treatment (Longabaugh, Wirtz, Zywiak, & O'Malley, 2010). Additionally, preliminary work utilizing a network framework to offer treatment for alcohol dependence shows that when friends and family are involved in the treatment process, and are shown by professionals how to provide proper support to an alcohol dependent individual in treatment, reduced alcohol use rates are observed following treatment (Copello, Orford, Hodgson, Tober & Barnett, 2002). These findings suggest that similar to goal

formation, social networks play an important role in subsequent alcohol use following treatment, and may even have an influence on the goals individuals adopt concerning alcohol use.

It is likely that there is a social influence related to goal formation, but no research has yet examined this relationship. On the one hand, it is likely that a social network that provides continual feedback concerning whether a particular goal has been met, and offers some type of reward for meeting a particular goal can serve as reinforcement for continued goal adherence. On the other hand, it may be likely that the formation of a specific goal leads individuals to seek out other like-minded individuals with the same goal. Both scenarios suggest a relationship, but it is unclear whether a specific type of social network influences goal formation, or whether a specific type of goal influences social network formation. Future longitudinal research on these topics will help address this question and offer insight into how to promote successful recovery from alcohol related problems.

This dissertation focused on the social network ties of individuals with alcohol use disorders, how they influence individuals to seek out treatment, and which factors in the early treatment process are key points for understanding how positive treatment outcomes are achieved. The knowledge gained from these studies will fill several needed gaps in the literature concerning treatment use and alcohol use disorders. Furthermore, these results will offer insight into serving several at-risk populations, including individuals with alcohol dependence and a few number of social network ties, and alcohol dependent individuals in treatment who do not adopt a goal of abstinence.

As social workers and psychologists, our mission is to improve the lives of people, especially those in need. Through improving treatment entry for alcohol dependence and identifying causes of positive outcomes associated with treatment for alcohol dependence, I

believe this dissertation has been conducted in the spirit of both social work and psychology. Additionally, through identifying future areas of need in this area of social work and psychology, it is clear that the work contained within this dissertation is only the beginning. By extending this research into the future directions identified above, we can successfully design interventions to meet the objective of *Healthy People 2020* (USDHHS, 2010a) to understand how social determinants influence health and well-being. Through the use of systems-thinking approaches to health (USDHHS, 2010b), including the examination of social network ties, it is likely that we can offer more to understanding how individuals experiencing health problems, such as alcohol use disorders adopt strategies to promote health and well-being.

References

- American Psychological Association. (2013). About APA. Mission Statement. Retrieved 2/20/13, 2013, from <http://www.apa.org/about/index.aspx>
- Berkman, L. F., & Syme, S. L. (1979). Social Networks, Host Resistance, and Mortality: A Nine-Year Follow-up Study of Alameda County Residents. *American Journal of Epidemiology*, *109*(2), 186–204.
- Bond, J., Kaskutas, L. A., & Weisner, C. (2003). The persistent influence of social networks and alcoholics anonymous on abstinence. *Journal of Studies on Alcohol*, *64*(4), 579–588.
- Booth, B. M., Yates, W. R., Petty, F., & Brown, K. (1991). Patient Factors Predicting Early Alcohol-Related Readmissions for Alcoholics: Role of Alcoholism Severity and Psychiatric Co-Morbidity. *Journal of Studies on Alcohol and Drugs*, *52*(1), 37.
- Brisette, I., Cohen, S., & Seeman, T. E. (2000). Measuring social integration and social networks. In *Social support measurement and intervention: A guide for health and social scientists*. (pp. 53–85). New York, NY, US: Oxford University Press.
- Bullers, S., Cooper, M. L., & Russell, M. (2001). Social network drinking and adult alcohol involvement: A longitudinal exploration of the direction of influence. *Addictive Behaviors*, *26*(2), 181–199.
- Burk, W. J., Van der Vorst, H., Kerr, M., & Stattin, H. (2012). Alcohol use and friendship dynamics: selection and socialization in early-, middle-, and late-adolescent peer networks. *Journal of studies on alcohol and drugs*, *73*(1), 89–98.
- Cassel, J. (1976). The Contribution of the Social Environment to Host Resistance. *American Journal of Epidemiology*, *104*(2), 107–123.
- Cohen, E., Feinn, R., Arias, A., & Kranzler, H. R. (2007). Alcohol treatment utilization: Findings from the National Epidemiologic Survey on Alcohol and Related Conditions. *Drug and Alcohol Dependence*, *86*(2–3), 214–221.
- Cohen, S., Doyle, W. J., Skoner, D. P., Rabin, B. S., & Gwaltney, J. M. (1997). Social ties and susceptibility to the common cold. *Journal of the American Medical Association*, *277*(24), 1940–1944.
- Cohen, S., Gottlieb, B. H., & Underwood, L. G. (2000). Social relationships and health. In *Social support measurement and intervention: A guide for health and social scientists*. (pp. 3–25). New York, NY, US: Oxford University Press.
- Cohen, S., & Janicki-Deverts, D. (2009). Can We Improve Our Physical Health by Altering Our Social Networks? *Perspectives on Psychological Science*, *4*(4), 375–378.
- Cohen, S., & Syme, S. L. (1985). Issues in the study and application of social support. In *Social support and health*. (pp. 3–22). San Diego, CA, US: Academic Press.
- Cohen, S., & Wills, T. A. (1985). Stress, social support, and the buffering hypothesis. *Psychological Bulletin*, *98*(2), 310–357.
- Copello, A., Orford, J., Hodgson, R., Tober, G. & Barrett, C. (2002). Social behaviour and network therapy: Basic principles and early experiences, *Addictive Behaviors*, *27*(3), 345-366.
- DeJong, W., Schneider, S. K., Towvim, L. G., Murphy, M. J., Doerr, E. E., Simonsen, N. R., ... Scribner, R. A. (2006). A Multisite Randomized Trial of Social Norms Marketing Campaigns to Reduce College Student Drinking. *Journal of Studies on Alcohol and Drugs*, *67*(6), 868.

- Favazza, A. R., & Thompson, J. J. (1984). Social Networks of Alcoholics: Some Early Findings. *Alcoholism: Clinical and Experimental Research*, 8(1), 9–15.
- Galea, S., Nandi, A., & Vlahov, D. (2004). The Social Epidemiology of Substance Use. *Epidemiologic Reviews*, 26(1), 36–52.
- George, A. A., & Tucker, J. A. (1996). Help-seeking for alcohol-related problems: Social contexts surrounding entry into alcoholism treatment or Alcoholics Anonymous. *Journal of Studies on Alcohol*, 57(4), 449–457.
- Gordon, A. J., & Zrull, M. (1991). Social networks and recovery: One year after inpatient treatment. *Journal of Substance Abuse Treatment*, 8(3), 143–152.
- Gourash, N. (1978). Help-seeking: a review of the literature. *American journal of community psychology*, 6(5), 413–423.
- Grant, B. F., Dawson, D. A., Stinson, F. S., Chou, S. P., Dufour, M. C., & Pickering, R. P. (2004). The 12-month prevalence and trends in DSM-IV alcohol abuse and dependence: United States, 1991–1992 and 2001–2002. *Drug and Alcohol Dependence*, 74(3), 223–234.
- Groh, D., Jason, L. A., Ferrari, J., & Halpert, J. (2011). A longitudinal investigation of the predictability of the three-factor model of the Important People Inventory. *The American Journal of Drug and Alcohol Abuse*, 37(4), 259–263.
- Harold, R. (1983). Relapsed versus non-relapsed alcohol abusers: Coping skills, life events, and social support. *Addictive Behaviors*, 8(2), 183–186.
- Homish, G. G., & Leonard, K. E. (2008). The Social Network and Alcohol Use. *Journal of Studies on Alcohol and Drugs*, 69(6), 906.
- Hunter-Reel, D., McCrady, B. S., Hildebrandt, T., & Epstein, E. E. (2010). Indirect Effect of Social Support for Drinking on Drinking Outcomes: The Role of Motivation. *Journal of Studies on Alcohol and Drugs*, 71(6), 930–937.
- Kaskutas, L. A., Bond, J., & Humphreys, K. (2002). Social networks as mediators of the effect of Alcoholics Anonymous. *Addiction*, 97(7), 891–900.
- Kaskutas, L. A., Weisner, C., & Caetano, R. (1997). Predictors of Help Seeking among a Longitudinal Sample of the General Population, 1984-1992. *Journal of Studies on Alcohol and Drugs*, 58(2), 155.
- Knecht, A. B., Burk, W. J., Weesie, J., & Steglich, C. (2010). Friendship and Alcohol Use in Early Adolescence: A Multilevel Social Network Approach. *Journal of Research on Adolescence*, 21(2), 475–487.
- Litt, M. D., Kadden, R. M., Kabela-Cormier, E., & Petry, N. M. (2009). Changing network support for drinking: Network Support Project 2-year follow-up. *Journal of Consulting and Clinical Psychology*, 77(2), 229–242.
- Longabaugh, R., Donovan, D. M., Karno, M. P., McCrady, B. S., Morgenstern, J., & Tonigan, J. S. (2006). Active Ingredients: How and Why Evidence-Based Alcohol Behavioral Treatment Interventions Work. *Alcoholism: Clinical and Experimental Research*, 29(2), 235–247.
- Longabaugh, R., Wirtz, P. W., Zywiak, W. H., & O'malley, S. S. (2010). Network Support as a Prognostic Indicator of Drinking Outcomes: The COMBINE Study. *Journal of Studies on Alcohol and Drugs*, 71(6), 837–846.
- Maisto, S. A., Pollock, N. K., Cornelius, J. R., Lynch, K. G., & Martin, C. S. (2003). Alcohol relapse as a function of relapse definition in a clinical sample of adolescents. *Addictive Behaviors*, 28(3), 449–459.

- Manuel, J. K., McCrady, B. S., Epstein, E. E., Cook, S., & Tonigan, J. S. (2007). The Pretreatment Social Networks of Women With Alcohol Dependence. *Journal of Studies on Alcohol and Drugs*, 68(6), 871.
- Mattern, J. L., & Neighbors, C. (2004). Social Norms Campaigns: Examining the Relationship between Changes in Perceived Norms and Changes in Drinking Levels. *Journal of Studies on Alcohol and Drugs*, 65(4), 489.
- Mohr, C. D., Averno, S., Kenny, D. A., Boca, D., & K, F. (2001). "Getting By (or Getting High) with a Little Help from My Friends": An Examination of Adult Alcoholics' Friendships. *Journal of Studies on Alcohol and Drugs*, 62(5), 637.
- Morgan, D. L., Neal, M. B., & Carder, P. (1997). The stability of core and peripheral networks over time. *Social Networks*, 19(1), 9–25.
- National Association of Social Workers. (2013). Code of Ethics, Preamble Retrieved 2/20/13, 2013 from <http://www.socialworkers.org/pubs/code/code.asp>
- Perkins, H. W., & Craig, D. W. (2006). A Successful Social Norms Campaign to Reduce Alcohol Misuse Among College Student-Athletes. *Journal of Studies on Alcohol and Drugs*, 67(6), 880.
- Pescosolido, B. A. (1992). Beyond Rational Choice: The Social Dynamics of How People Seek Help. *American Journal of Sociology*, 97(4), 1096–1138.
- Pescosolido, B. A., Gardner, C. B., & Lubell, K. M. (1998). How people get into mental health services: Stories of choice, coercion and "muddling through" from "first-timers". *Social Science & Medicine*, 46(2), 275–286.
- Pescosolido, B.A. (1991). Illness careers and network ties: a conceptual model of utilization and compliance. In Albrecht, G. & Levy, (Eds.), *Advances in Medical Sociology* (pp. 164–181). Greenwich, C.T.: JAI Press.
- Thoits, P. A. (1983). Multiple identities and psychological well-being: A reformulation and test of the social isolation hypothesis. *American Sociological Review*, 48(2), 174–187.
- U.S. Department of Health and Human Services. (2010a). *Healthy People 2020*. Washington, DC 2010.
- U.S. Department of Health and Human Services. (2010b). *The contributions of behavioral and social sciences research to improving health of the nation: A prospectus for the future*. Washington, DC 2010.
- Whitford, J. L., Widner, S. C., Mellick, D., & Elkins, R. L. (2009). Self-Report of Drinking Compared to Objective Markers of Alcohol Consumption. *The American Journal of Drug and Alcohol Abuse*, 35(2), 55–58.