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Consensus on Beliefs about Addiction in a Network of

Addiction Recovery Volunteers

By

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A Thesis

Presented to the Graduate and Research Committee

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CONSENSUS ON BELIEFS ABOUT ADDICTION IN A NETWORK OF ADDICTION RECOVERY VOLUNTEERS

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Abstract

There is ample evidence that drug and alcohol addiction is a serious public health issue in the United States, but little agreement about the exact nature, causes, and best treatment of addiction. Sociological theory suggests that group membership has an impact on health behaviors such as drug and alcohol use, an idea which is reflected in many current treatments for addiction. This study examines the relationship between social ties and beliefs about addiction through cultural consensus and social network surveys of a group of volunteers at a drug and alcohol recovery service center. Due to a small sample size the results are inconclusive, but useful methods for the study of this topic as well as avenues of future research are explored.

Introduction

According to a national survey conducted by the Substance Abuse and Mental Health Services Administration of the U.S. Department of Health and Human Services (2014), over 20 million Americans aged 12 and older met the diagnostic criteria for substance dependence or abuse in 2013. Four million respondents reported having sought assistance with a drug or alcohol-related problem in the previous year (Substance Abuse and Mental Health Services Administration 2014).

In the United States understanding of the nature of problematic drug and alcohol use as well as appropriate treatment of it have been strongly influenced by a mutual self-help group formed in 1935. Alcoholics Anonymous and its Twelve-step model of alcoholism and recovery deeply shaped early research and theory related to problematic drug and alcohol use (Valverde 1998). This influence continues today, although competing understandings of problematic drug and alcohol use and how to treat it are on the rise. Given the definitional disagreement it should not be surprising that what to call the problem is a matter of debate among these different perspectives. Within this paper the term "addiction" is used to refer to problematic drug and alcohol use because the term is concise, intuitive, and is used by the organization being studied.

From a sociological perspective, the ability of a mutual self-help group to effect a change in health behaviors has theoretical support. The existence of multiple ideological perspectives on the nature of the problem and its treatment suggests the possibility of ideological negotiation or conflict among those who address the problem personally or professionally.

These themes of group membership and multiple beliefs about addiction are found together at the study site, a non-profit organization offering professional recovery support programs for those seeking help for addiction. The organization is not named in this paper in order to provide the utmost protection to the anonymity of participants, which is

discussed later. This organization embraces a multi-pathway perspective of treatment and recovery, meaning that they do not endorse any single ideological perspective or course of treatment but instead encourage clients to find the perspective and treatment options that best suit their needs. Furthermore, it relies heavily on volunteer labor and many clients provide volunteer services during and after their enrollment as clients. Volunteers work together in the provision of services and meet monthly for volunteer meetings. Therefore, this organization offers a site where social relationships centered on recovery occur in an ideologically open environment.

Investigation of the relationship between social relationships and beliefs about addiction was done by conducting consensus and social network surveys of a sample of volunteers at one of the host organization's recovery support centers. The goals of these surveys were to determine (1) the overall network structure of the social ties between volunteers, (2) whether a consensus existed among volunteers regarding addiction/recovery propositions, and (3) if there was a relationship between network position and the individual's agreement with the group regarding those propositions. It was hypothesized that if an overall consensus existed, individuals who were more central to the group would be more representative of that consensus.

In the following sections a review of the literature related to social impacts on health behaviors is presented, as well as a review of several existing perspectives on the nature of addiction and its treatment. After this background, the methods employed in this study are described and the results are discussed. Although the study was not able to draw any definite conclusions, it provides some useful demonstrations of methodological techniques and offers numerous avenues for future research.

Review of Literature

Social Components of Health Behavior

Addiction behavior, as with all human behavior, occurs within a context of other social actors and structural forces. Furthermore the concept of addiction itself is not obvious and natural but is socially constructed. It is therefore appropriate to look to sociological theory for tools to understand addiction. Sociology has traditionally dealt with addiction as either a type of deviance or as part of the sociology of health and medicine. This paper deals with the later aspect of the sociology of addiction, examining models of how the social world influences health behaviors and the ways in which the concept of addiction is constructed and contested.

Social Ecological Models. Social ecological models are theoretical tools that attempt to capture the contextual factors influencing health behavior or outcomes. They generally consist of a series of nested levels, where each progressive level indicating a larger scale and subsuming all levels below it. Each level is influenced by the levels above and below, and influences them as well, as process well described as "reciprocal causation" (McLeroy et al. 1988) Health interventions have largely targeted the individual, but social ecological models encourage reflection on supra-individual influences on health and suggest that interventions may be effective at levels other than the individual. There is some variation in where different elements of social organization are included and some variation of focus due to the purpose for which the model was developed.

The first ecological model was proposed by Urie Bronfenbrenner (1979) as a way of understanding child development. His argument was somewhat remarkable in that he argued that the study of child development must include indirect influences, such as the parents' work environments, when examining child development (Bronfenbrenner 1979:7). His model, shown in Figure 1, consists of the microsystem, mesosystem, exosystem, and macrosystem (Bronfenbrenner 1979:7–8; McLaren and Hawe 2005). The

microsystem includes direct interactions with parents, caregivers, teachers, and objects, as well as the relationships and interactions between those agents (Bronfenbrenner, 1979, p.7). The mesosystem is the interaction between various microsystems, such as the relationship between the parent and the school (Bronfenbrenner, 1979, p. 7-8). The exosystem contains factors that are not directly experienced by the child but nevertheless influence the microsystem, ranging from factors such as the unemployment rate to the work environment of a parent (Bronfenbrenner, 1979, p.8). The macrosystem signifies the overarching cultural values and organization of a society, patterns that influence all lower levels and vary between societies (Bronfenbrenner, 1979, p.8).

Social theorists have capitalized on Bronfenbrenner's model as a way to conceptualize the many levels of influence that inform individual behavior of all types. A number of variations on Bronfenbrenner's ecological model have been created, which are collectively referred to as social ecological models. Probably the most influential social ecological model is the one formulated by McLeroy, Bibeau, Steckler, & Glanz (1988). This model suggests that health behavior is influenced by factors at the intrapersonal, interpersonal, institutional, community, and public policy levels. Intrapersonal factors include psychological characteristics, biological processes, and cognitive processes. Interpersonal factors include the influence of social contacts such as family, friends, coworkers, and acquaintances, with

Figure 1: Bronfenbrenner's Ecological Model

an emphasis on the role of norms and social network processes. Organizational influences include workplaces and voluntary organizations such as churches and neighborhood associations (1988: 355-360). Community factors include friendship networks, neighborhoods, relationships between organizations, and political power. Policy level factors include federal, state, and local policy as well as policy analysis and advocacy (1988:362–366).

McLeroy, et al., (1988) propose a particularly nuanced use of community. Their model includes three definitions of community, all of which are contained within the same level. The first definition is that of community as composed of networks of strong social ties. Such networks may include family groups, informal friendship networks, neighborhoods, and voluntary organizations such as churches. The second definition is that of community as relationships between organizations that provide health and human services. Such relationships may be positive, such as in coalition building and program coordination, or negative, as in competition and duplication of services. A third definition is that of community as a political entity, with power (or lack thereof) to influence policy and resource allocation in favor of its constituents (1988:363–365).

That this definition includes three separate concepts exhibits the difficulty of defining community. The context in which an individual is embedded contains a level which is more expansive than their immediate interactions but less universal than national policy or cultural norms, and the results of conceptualizing this "meso" level can be ambiguous and imprecise. In this model, for example, families might be included both as interpersonal influences and community influences (McLeroy, et al. 1988). Similarly churches and voluntary organizations can be included at the level of organization and of community (McLeroy, et al. 1988). This difficulty of specifying mutually-exclusive levels of analysis is seen in most social ecological models.

However, there are some important observations to be found in the analysis of community offered in this work. McLeroy, et al., characterize the social networks included

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in the level of community as structures that mediate more macro structural forces and ideology (1988: 363). This suggests that structures at this level may be the agent of reproducing and enforcing norms from the larger social structure, or they may diminish the influence of such forces and/or offer alternate beliefs and behavior norms. Furthermore, reciprocal causation indicates that community level structures play an important role in influencing more macro level norms and beliefs. This role of mediation and moderation of structural forces and norms on individuals suggests that these structures can have an important role in health.

In this study, the host organization may be seen to operate at both the organizational and community level. As volunteers, the respondents in this study conduct their service in the context of the organization. The organization also explicitly aims to reduce stigma around addiction and engages in lobbying and outreach programs to this end, qualifying it for inclusion at the level of community as well. The measures in this study target interpersonal relationships at the individual level, and attempt to examine the organizational context through network and consensus analysis.

Health Lifestyle Theory. Social ecological models assist in better theorizing the context in which an individual and his or her health is located. However, the way in which the social environment is translated into individual choice is not addressed. Cockerham (2013) addresses this question in his health lifestyle model. Building off Weber and Bourdieu, the model attempts to theorize the way that individual health choices are influenced by structural and social factors.

As seen in Figure 2, Cockerham contains all the supra-individual levels of the social ecological models in a single box, shown at the upper right in the model (2013: 67). In his view, health behaviors are the result of the interplay between life choices and life chances that produces a disposition toward a particular action. Demographic variables, class, voluntary association groups, and living conditions are considered the originating forces that influence both the socialization which guide life choices and the structural conditions that

constitute life chances. These interact to create a habitus, or disposition to act in a certain way, leading to actual health practices such as smoking or exercise, which then reinforce the disposition to act and reproduce the health lifestyle (Cockerham 2013: 67).

Cockerham's theory relies on theories of lifestyle developed by Weber, Bourdieu, and Giddens (Cockerham, Rütten, and Abel 1997) . Lifestyle is understood to mean a patterned set of behaviors that are markers of status, based on consumption, clustered, deeply shaped by structural forces but based on individual choice, and increasingly important in the (high) modern age (Cockerham et al. 1997). After a consideration of each of these points, Cockerham's argument regarding the application of lifestyle to health will become more clear.

As described by Cockerham, et al., (1997) Weber's concept of lifestyle is intimately related to status groups. A status group is defined by Weber as a group of people who share a claim to social honor. These groups are separate from (although related to) economic classes and political parties, affiliations which also structure society. Lifestyle is a pattern of consumption that both expresses status and defines it. This identification by consumption differentiates status from class identification, which is based on relationship to production. A member of a certain status group
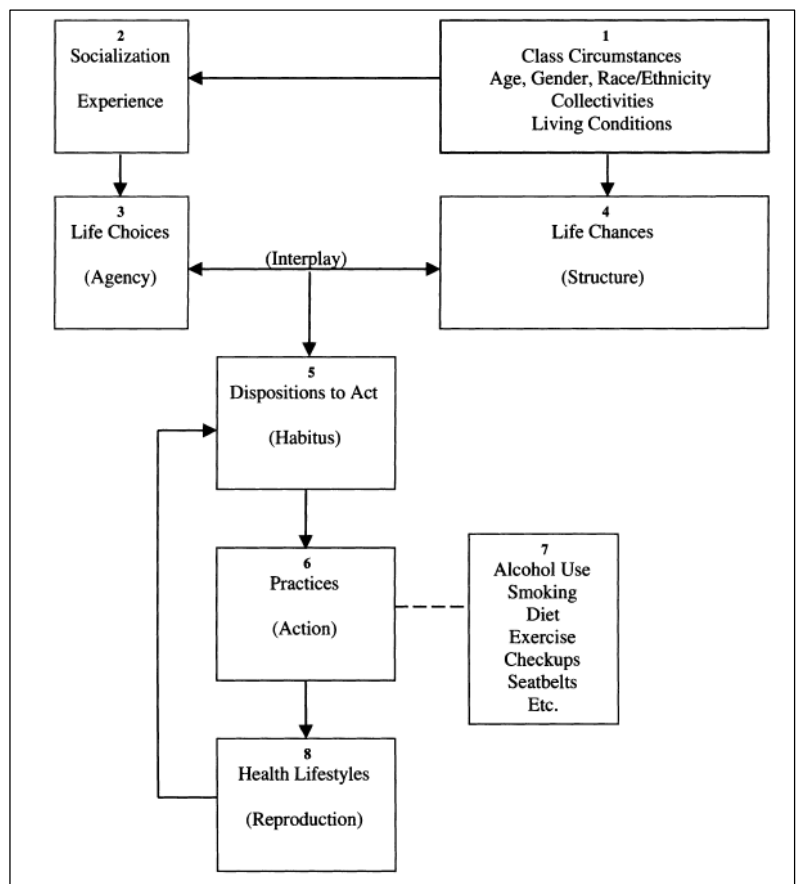
Figure 2: Cockerham's Health Lifestyle Paradigm

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displays his or her status by the consumption choices s/he makes and making appropriate consumption choices is necessary for inclusion in the group (Cockerham et al. 1997).

Although Weber's concept of status groups was formulated in reference to high-status groups, low-status groups also share a common relationship to social honor and prestige in society at large (a relationship of lack rather than bounty). Furthermore, even groups with relatively low status in society as a whole may compete with each other, differentiating themselves through consumptive practices. There is also no reason to assume that status is dichotomously "high" or "low". Instead, it should probably be seen as a continuum. Therefore, the application of status group theory is possible for groups throughout society.

The pattern of consumption that makes up lifestyle is neither random nor rigid. Rather, Cockerham relies on Bourdieu to describe lifestyle as a clustered set of preferences that shape consumption (Cockerham et al. 1997). Bourdieu argued that the structures of the social world, combined with an individual's life experience, create an engine of preference he called the habitus (Cockerham et al. 1997). Thus, general principles of appropriate choices are built through the life course and may be applied in any given situation to produce a choice that reflects an individual's status group, most often without conscious deliberation on the part of the actor. However, individuals are not prisoners to their socialization or life choices. Rather, they pursue their goals through strategies, choices between possible options (Cockerham 2013: 77). These choices and their outcomes modify the likelihood of making similar choices in the future (Cockerham 2013: 77). Thus, the habitus finds its place in Cockerham's model as the predisposition to act in a given way based on one's life choices and life chances (Cockerham 2013: 67).

The question remains, however, of how health behavior can be considered a lifestyle and thus amenable to analysis using theories of lifestyle. It is true, Cockerham concedes, that behaviors related to health have not always been what can be called a lifestyle (2010: 159). A number of factors have influenced the development of health lifestyles, including

the decreasing authority of medical professionals and the change in deadly disease profile from infectious to chronic disease (Cockerham 2010: 160). These changes mean that individuals are increasingly responsible for their own health and that individual choices matter more than ever for health outcomes. In addition to these somewhat practical reasons, Cockerham agrees with Giddens that in all areas of high modern life identity is constructed through consumptive choice (Cockerham et al. 1997). Health behaviors are increasingly based on consumption, and increasingly one's health behaviors play a vital role in identity (Cockerham 2010). Thus, understanding health behaviors is aided by understanding theories on lifestyle.

Cockerham's health lifestyle theory offers some important insights into health. The first is that it suggests that health behavior choices are not simply rational calculations of cost versus benefit, such as whether the inconvenience of a scheduling a checkup outweighs the value of preventative care. Cockerham's theory suggests that health behaviors may be consumptive patterns which reflect and affirm group membership. His theory also explains the clustering of health behaviors by relating such clustering to the way health behavior decisions are made via the habitus.

Although the model does not explicitly state this, one might argue that health beliefs are in some sense not primarily held by an individual, but are instead shared beliefs. Membership in a given (status) group demands adherence to the lifestyle of that group, and health behaviors are part of the consumptive practices that characterize such groups.

Furthermore, the inclusion of Bourdieu in the model indicates that the choice of health behaviors in a given group need not be explicit or reasoned. Rather, health behaviors are patterned according to underlying schemas developed in the habitus of those within the group, directing group members to choices that are in keeping with these schemas. What the organizing principles these schemas represent is a subject for future research.

Cockerham's condensation of all supra-individual factors into a single module has some disadvantages. It does not assist, for example, in determining how these factors

relate to each other, or what happens when their influences contradict one another. In all of his work on the topic Cockerham describes the ways that class position, race and ethnicity, gender, etc. relate to health, but his model is unable to describe the interplay of these variables. If understanding the makeup of the habitus is necessary to understand health behaviors, then understanding how key structural variables combine to impact the habitus will be necessary. Similarly, the idea of hierarchical levels of influence found in social ecological models is lost here, along with the idea that intermediate levels may mediate between those above and below. However, Cockerham's model offers a compelling idea: health behaviors are part of lifestyle, and lifestyle is primarily a function of social, structural variables.

In this study, a group is identified which has been formed for the explicit purpose of health behavior change. The study sample is specifically those who have chosen to volunteer their time to assist in the continued functioning of the organization. The idea that social factors influences health behaviors, or that the health behaviors in question are part of a larger lifestyle, does not appear foreign to this group. As seen below, the organization specifically attempts to (a) connect those trying to change their behavior with others attempting to do the same, and (b) address many aspects of the individual's life in order to support this change. Therefore, this theory, in combination with the social ecological models described above, suggest that this group may in fact be facilitating lifestyle change through integration into a new social group that can mediate and buffer the influence of previously determinate supraindividual factors.

Addiction and Recovery: Contested Meanings

Addiction, or problematic use of drugs or alcohol perhaps characterized by lack of control over use, is not a uniformly understood concept. Since this study will be investigating the understanding of addiction held by volunteers at a recovery services

organization, and will test propositions from known models to do this, a review of major models of addiction and recovery is presented below.

Moral Model. The earliest recognized model of addiction (at the time mostly referring to alcoholism) was one of moral weakness or wickedness (Valverde 1998). In this view, the addict persisted in immoral behavior due to sinfulness and came to the habit by way of moral laxness. As the temperance movement gathered steam in the United States, alcoholism came to be seen as an effect of drinking which could affect anyone who had inherited a poor constitution (Valverde 1998). In the case of both certain drugs and alcohol (but not in the case of tobacco or caffeine), the belief that one could become addicted arose, meaning that one could lose the power to stop taking the substance. Even in those who were not victims of compulsive use, recreational drinking and drug use was associated with a variety of moral and social ills (Morgan 1981; Valverde 1998). Since the substance itself was seen as the primary culprit, campaigns arose for prohibition and the classification of recreational drug use as illegal (Morgan 1981; Valverde 1998). Recovery from this state of addiction was offered through numerous quasi-medical institutions and elixirs, as well as through the grace of God (Morgan 1981; Valverde 1998). Abstinence from the substance was the goal, although such abstinence was recognized as fragile (Morgan 1981; Valverde 1998). While understanding the outlines of this model are important for understanding the later reactions to and reconfigurations of it, it is not endorsed by any institutional body outside of a few fundamentalist churches and so is not directly investigated in the survey used in this study.

Twelve-step Model. From the ashes of prohibition rose a new idea of alcoholism, popularized by the self-help group Alcoholics Anonymous and particularly by its "Big Book" published in 1939 (Valverde 1998). This conception of alcoholism featured an abnormal person, unusually sensitive to alcohol for reasons unknown, for whom casual drinking would inevitably result in a deadly progression in which the person lost the ability to control or

stop their drinking (Valverde 1998). In the temperance model, alcohol was deleterious to everyone and had the added drawback of causing compulsive drinking in those possessing a weakened constitution due to heredity (Valverde 1998). This distinction between the casual and compulsive user is widely accepted today. This distinction was not immediately made in the case of now-illicit drugs, and it can be argued that it still has not been made completely since drug use of any kind remains stigmatized and legal penalties for use can be quite severe (Morgan 1981). However, the twelve-step model, which does make this distinction, is used by self-help groups for substance addictions such as alcohol and drugs as well as behavioral addictions such as gambling, overeating, and sex (Albanese and Shaffer 2012).

The primary cause of addiction is unknown in this model. The individual is thought to be abnormal, to exhibit an abnormal physical and psychological response to alcohol or drugs, but the cause of this abnormality is not specified or known (Alcoholics Anonymous 2001). Addiction is seen as a chronic disorder characterized by loss of control with no permanent cure for the abnormality (Alcoholics Anonymous 2001). The formula is summed up in regard to alcohol thus, "If, when you honestly want to, you find you cannot quit entirely, or if when drinking, you have little control over the amount you take, you are probably alcoholic. If that be the case, you may be suffering from an illness which only a spiritual experience can conquer" (Alcoholics Anonymous 2001:44). The needed "spiritual experience" is achieved through adherence to a mutual support self-help group, use of a codified procedure of self-examination, development of a relationship with a Higher Power, and service to others afflicted with the same disorder (Alcoholics Anonymous 2001). This formula has been applied to compulsions and addictions of many types and greatly influenced the medical model discussed below.

Medical Model. The AA conception of alcoholism, and by extension addiction, was developed in the medical and scientific world by scholars at the Yale Research Center on Problems of Alcohol, particularly by E.M. Jellinek (Valverde 1998). Not by accident, the center took as its early research subjects the largely White, middle-class, male members of

AA and produced accounts of alcoholism based on their experiences (Valverde 1998). Female members of AA and other persons obviously suffering from problems with alcohol (such as skid row drunks) were excluded from the research, a move that helped secure funding by construing alcoholism as an affliction affecting the most powerful and mainstream members of society (Valverde 1998). That this inevitably created a concept of alcoholism (and later addiction) that may not have described the experience of everyone should not be overlooked.

Today addiction is diagnosed by use of the American Psychiatric Association's clinical and research reference book, the Diagnostic and Statistical Manual of Mental Disorders (DSM) (Hasin 2003). The diagnosis is substance use disorder and is considered an impulse control disorder (Albanese and Shaffer 2012). The most recent (fifth) edition, DSM-V, published in 2013, represents a change in the diagnostic criteria. Previously, in the fourth edition, drug and alcohol disorders were categorized separately, and troublesome use could be diagnosed as either abuse (the markers of which included items such as use despite negative consequences) or dependence (which required meeting the standard for abuse as well as exhibiting physical withdrawal from the substance) (Hasin 2003).

The DSM-V aims to better match international classification schemes by collapsing the dichotomous distinction between abuse and dependence, and between alcoholism and other drug abuse (American Psychiatric Association 2013). Instead, the indicators included in both abuse and dependence categories of previous DSMs are presented in a single category, on which an individual can be diagnosed as having a mild, moderate, or severe disorder (American Psychiatric Association 2013). Compulsion was also added as a diagnostic feature, described in this scheme as a craving to use the substance in question (American Psychiatric Association 2013). Since the DSM-IV criteria was used until quite recently, and since much funding for treatment and research depends on the DSM criteria, it is worth considering both definitions as they represent an influential source of definition.

The change of definitions reflects both international trends and national debates regarding the nature of addiction.

The medical model does not explicitly concern itself with the causes of addiction. However, research around addiction in the medical field has included investigation into the roles of genetics, biology, and psychology in addiction (Albanese and Shaffer 2012). However, the continued dependence on twelve-step models for treatment of alcoholism (Volpicelli and Szalavitz 2000) indicates the limitations of the medical community in developing medical treatments for this condition based on its own definition. Logically the definition of recovery for this model ought to be the failure to meet the diagnostic criteria for a substance use disorder; however, most treatment facilities to which patients are referred actually emphasize abstinence and most work on twelve-step principles of recovery (Volpicelli and Szalavitz 2000). That is, alcoholism seems to occupy an unusual position in which it is clinically identifiable but not well treated by explicitly medical means.

Harm Reduction Model. The harm reduction model posits that problems with drugs and alcohol are not monolithic and argues that abstinence need not be the only way to resolve these problems (Denning, Little, and Glickman 2004). Here the use of the term addiction becomes particularly problematic, because harm reduction identifies a continuum of harm that might be experienced as a result of drug and alcohol use and claims that the term "addiction" as popularly understood corresponds only with the most severe harms that may be experienced (Denning et al. 2004). This approach differs most dramatically from the twelve-step model in its approach to recovery, which will be discussed below, but it also differs in its understanding of the causes and nature of problematic drug and alcohol use. As discussed above, the twelve-step model identifies the primary source of problematic drug and alcohol use as being internal to the individual, related to physical and mental differences between the addicted individual and the non-addicted individual. Harm reduction suggests that problematic drug and alcohol use is generally a symptom of other difficult life experiences or circumstances, rather than their cause (Denning et al. 2004). The problem,

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then, is located in the life experience rather than the essential nature of the sufferer. Furthermore, this problem may be mild or severe, may affect some or all spheres of life, and may wax and wane across the lifespan. It is not seen as an identity or as necessarily chronic.

Recovery in this model is a process of reducing the harms caused by drug or alcohol use (Denning et al., 2004). The goal is not necessarily abstinence, although it may be if the individual defines success in that way (Denning et al. 2004). The focus here is on the process of becoming aware of use, determining harms being caused by use, and experimenting with ways of reducing use or addressing underlying issues causing drug use (Denning et al. 2004). Harm reduction suggests starting wherever one is with making small changes or just monitoring use (Denning et al. 2004). This is in sharp contrast to the twelve-step model which suggests recovery is effected by an entire change of life and mind that is necessarily preceded by utter desperation (hitting bottom). Although not explicitly within the harm reduction paradigm, research by Cloud and Granfield (2008) suggest that those with more resources in terms of money, employment, social support, mental health, and ideas that support their integration in society are more likely to sustain changes that reduce their use/misuse of a substance and/or the harm it causes. In this view recovery involves an improvement in quality of life, exists on a continuum of change, and is supported by positive resources rather than by desperation.

Other Models Not Addressed. These reflect only a few of the models that have been developed to explain the causes and nature of addiction. Albanese and Shaffer (Albanese and Shaffer 2012) identify 13 distinct theoretical models of addiction, including for example theories of moral weakness and social learning. The models included here were chosen for their penetration of the treatment field (twelve-step and biomedical approaches), or because of their unique features and connection to ideas of multipathway recovery endorsed by the organization under study (harm reduction).

It should also be noted that this review does not attempt to examine models of use, misuse, and addiction used by those in communities of active use or by the public at large. It is probable that these differ from any of the formally elaborated theories discussed above and may contain elements of all of these, possibly even contradictory elements, as well as other elements not seen here. One of the questions of this study is what elements are contained in the working models of the volunteer group under investigation.

Summary

Sociological theory suggests that social relationships play an important role in decision-making related to health behaviors, both through mediating several layers of external influences and by influencing the pattern of consumptive behaviors of which health behaviors are a part. In the field of addiction many divergent ideas exist regarding the nature, causes, and treatment of addiction, rendering the mediating power of social relationships especially salient. Furthermore, the twelve-step model of treatment has always relied on the lifestyle-changing capacity of group membership to effect behavior change. From a sociological point of view, a relationship between group membership and belief in a heterogeneous ideological environment is well supported. In the next section the methods used in this study to investigate this relationship are discussed.

Methods and Measures

This research uses consensus analysis in conjunction with network analysis to examine the relationship between social relationships and health beliefs. The aims of the analysis are (a) to determine if consensus exists among volunteers about the nature of addiction and recovery, and (b) to determine if the placement of the individual in the social network of that volunteer group is related to beliefs. Background information on the participants, including demographic information and treatment history, was also collected to examine and control for these factors. A description of the measures used and analyses applied follows, with results described in the next section.

Anonymity

The research design was deeply shaped by a desire to preserve the anonymity of participants. This was due to the stigma associated with drug and alcohol addiction, and consequently recovery, and the hope that assurance of anonymity would improve recruitment as well as increase participant candor. Furthermore, there is a high value placed on public anonymity by twelve-step programs, and anonymity allows asking participants about their participation in such groups without causing conflict with that principle. It is also hoped that the test of a whole network survey design based on anonymity may allow use of such a design in other groups where the collection of identifying information poses a risk to participants or obstacle to recruitment.

In order to avoid collection of identifiable information, all surveys were printed with a participant number in the header. Packets were assembled containing the copy of each type of survey with the same participant number. The participant number also served as the identifier in the network survey. This allowed results from each survey be identified with an individual participant and analyzed together, but without any information that could provide the identity of the participants. However, this design also required that all data collection

occur at a single event since no identifiable information could be retained that would allow asynchronous network data collection.

With approval from the Institutional Review Board, signed consent forms were not collected. The consent form was reviewed with the group of participants at the beginning of the data collection (and individually for the two participants who arrived late) and all questions answered. It was explained that the consent form would be retained by the participants. Each survey contained a checkbox at the top next to a statement reading, "I have received and understand the Consent Form describing the risks and benefits of this study and how my responses will be protected and used. I am at least 18 years of age and I agree to participate in the study". Participants were asked to check this box before they began each survey and to notify the investigator if the statement was not true for them. This served as the verification of consent. Examination after data collection confirmed that this box had been checked on every survey collected.

Survey Site and Sample Recruitment

The sample was recruited from one of five drug and alcohol recovery service centers operated by the host organization. The director of evaluation at the host organization was involved in the development of the research project from its inception and reviewed and approved all questionnaires. The survey site was selected from among the organization's five centers for its relatively large number of volunteers and diversity in volunteer tenure. Several of the other centers had significantly smaller volunteer populations, and it was felt that this would hamper recruitment efforts. One center had a larger volunteer population but the average tenure of volunteers was believed to be much shorter at that center, which would have limited an important dimension of possible variation as well as the possibility of strong social relationships.

Once a service center had been selected, the center's volunteer coordinator was contacted to discuss recruitment. At the coordinator's request, recruitment was done by the

staff at the center, with the assistance of flyers provided by the investigator. The target

sample size for the study was 20-30 volunteers, and the date and time of the data collection

was chosen by the coordinator as the most advantageous time to attract volunteers.

Unfortunately, this target was not met, with only 11 participants completing the background

and consensus surveys and only 9 completing the network survey due to the late arrival of

two participants.

Measures

    Background Survey. The background survey (Appendix A) collected two types of

background information on participants. The first was demographic information, including

age, gender, and educational attainment. The second was topic-specific background

information including volunteer position and how long the participant has been volunteering.

Information on treatment and recovery history were also collected in order to account for

different ideological exposures. This information included whether or not the participant

lives in a recovery house, history of inpatient and outpatient treatment for addiction,

whether or not the participant considers themselves as in recovery from addiction, and

whether the participant regularly attends 12-step meetings.

    Consensus Survey. The consensus survey (Appendix B) collects data to determine

whether a cultural consensus exists among participants regarding the nature of addiction

and recovery. The beliefs that are targeted by the propositions include: What characteristics

distinguish an addict or alcoholic? What causes addiction? What is the nature of addiction?

What is the nature of recovery from addiction? How does recovery from addiction occur?

    The survey asks volunteers to rate their agreement to a number of propositions

related to addiction and recovery (i.e. "Recovery is only possible when someone has hit

bottom", "Addiction is a physical problem") using a five point scale ranging from "Strongly

disagree" to "Strongly agree". The five point scale was used to allow participants to select a

neutral position. A six point scale was considered in order to allow for dichotomization of

responses, but due to the fact that the survey was constructed using literature sources rather than interview data it seemed necessary to allow participants to select a neutral response in case a proposition appeared nonsensical or it presented a topic on which they had no knowledge.

As described in earlier sections, several perspectives exist regarding the nature of addiction and recovery. Time limitation prevented the traditional approach to consensus survey construction, which draws on interview data to select propositions for respondent consideration. Instead, core ideas were extracted from the ideological streams discussed in the section on addiction and propositions were built to test those ideas. The researcher's history of research on the twelve-step model and relationships with those in twelve-step based recovery provided some depth of grounding to the formulation of propositions related to that model, but propositions based on other models were drawn directly from literature review. The involvement of the site organization's director of evaluation was designed in part to temper the possible impact of these biases, and all questionnaires were reviewed by this organizational representative during formulation.

The consensus survey was constructed to draw primarily on the twelve-step and harm reduction models due to dormancy of the moral model and the extent of redundancy between the twelve-step and medical models. Due to the frequent diametrical opposition of the twelve-step and harm reduction models, the majority of questions were simultaneously positive tests of the twelve-step model (agreeing with the statement would indicate agreement with the twelve-step model) and negative tests of the harm reduction model. Table 1 shows the alignment of the propositions with the two models. One proposition, "I believe addiction is a moral problem" is drawn from the moral model and is a negative test of both primary models.

The analysis performed on the data collected by these surveys is consensus analysis, a form of Q-mode factor analysis developed by Romney, Weller, and Batchelder (1986). It is based on the assumption that if a cultural consensus exists, respondents will agree on their

answers to the survey instrument because they are responding from shared knowledge. The existence of consensus is tested by computing the agreement between each pair of respondents and running minimum residual factor analysis on the matrix of agreement measures. The first factor extracted from this analysis represents shared cultural knowledge and the first factor loading is a score of each individual's response profile as a representation of this shared knowledge base (Romney et al. 1986). In this study this score will also be used to test the relationship between belief consensus and social network structure.

Proposition	12 Step Model	Harm Reduction Model
Addicts and alcoholics are people whose whole lives revolve around drinking or drug use	+	
Addicts and alcoholics were addicts or alcoholics before they ever took a drink or drug	+	−
Addicts and alcoholics are people who have lost the power of choice in drinking or drug use	+	−
Addicts and alcoholics become addicts and alcoholics by drugging or drinking too much	−	+
Addicts and alcoholics can learn to use or drink in moderation	−	+
Addicts and alcoholics can't stay stopped without help	+	−
Addicts and alcoholics are fundamentally selfish	+	−
Addicts and alcoholics can't stop once they start	+	−
Addicts and alcoholics are psychologically different from non-alcoholic and non-addicted people	+	−
Addicts and alcoholics drink and use drugs primarily because of problems in their life	−	+
I believe anyone can develop alcoholism or drug addiction	+	+
I believe anyone who drinks or uses drugs risks addiction	−	+
I believe a person experiencing problems due to drug or alcohol use is probably addicted	+	−
I believe addiction is a permanent condition	+	−
I believe some people can drink socially	+	+
I believe some people can use drugs socially	+	+
I believe addiction is an illness	+	−
I believe addiction is a moral problem	−	−
I believe addiction is a physical problem	+	
I believe addiction is a psychological problem	+	+
I believe addiction is a spiritual problem	+	
Recovery is only possible when someone hits bottom	+	−
Recovery is only possible when someone admits powerlessness	+	−
Recovery can begin when someone is still using or drinking	−	+
Recovery is easier for a person with fewer problems in their life	−	+
Recovery can be defined as complete abstinence from all drugs and alcohol	+	−
Recovery can be defined as reducing the problems caused by drug and alcohol, even without completely stopping use	−	+
Recovery can mean different things to different people		+
Recovery is best achieved through more self-discipline	−	
Recovery is best achieved through learning coping skills		+
Recovery is best achieved by participation in a twelve-step program	+	
Recovery is best achieved by improving one's life		+

Table 1: Proposition alignment with 12 Step and Harm Reduction models of addiction

Network Survey. The network survey (Appendix C) was designed to test the existence and nature of social relationships among participants, all of whom volunteer at the drug and alcohol recovery service center that hosted the data collection. The survey was also designed so that no information about the participants needed to be collected, something which is generally necessary in whole-network surveys. The collection of data at a single time allowed this anonymity, as discussed above.

The survey contains a list of possible relationship markers between the respondent and the other participants. These possible relationships ranged from "I don't know this person" to "I consider this person a friend". The relationship markers were not simply a scale of closeness, however. After the option of "I don't know this person", the first three markers can be called acquaintance markers; they include having met or volunteered with the person and knowing the person's first and last name. The second group of markers relate to communication mediums such as having a person's phone number, texting or calling the person, and being connected on Facebook. The third group contain markers of support and friendship, including spending time together outside the center, giving and receiving support, and considering the person a friend. It should be noted that, as described above, qualitative pre-survey research was not available and the relationship markers were chosen by consultation with experienced researchers rather than context-specific information.

Each column of the survey form corresponded with one of the survey participants, identified by participant number (discussed above in the description of anonymity procedures). Starting with the participant with the survey packet marked "ID # 1", each participant was identified by number to the group and the other respondents checked the boxes that were true regarding their relationship with that person in the column with the corresponding number. This process was repeated until all participants had been identified and rated. Respondents were instructed to leave the column corresponding to their own number blank.

The data were entered into Microsoft Excel to produce matrices of relations suitable for sociocentric network analysis. This type of network analysis produces measures of the characteristics of an entire network as well as measures of the placement of an individual within that network. Based on graph theory, network analysis can also produce visual representations of networks. This provides an intuitive way to assess and compare networks. These graphs and measures are presented in the section on results.

Summary

Three surveys were developed to collect data on background, beliefs, and social relationships. The data collected from these surveys were subjected to both separate and cross-method analyses, the results of which are described in the next section.

Results

The total number of respondents for this study was 11. Of these, only 9 completed the network survey. This small sample size undermines the use of statistical testing. No attempt is made in the sections which follow to draw definitive conclusions from the analyses performed. However, the analyses do provide a useful demonstration of the kind of testing that can be performed on this type of data and should be considered in that light.

Background Survey

Demographics. The age distribution of the sample was clustered, with four participants in the 31-40 range and five in the 51-60 range. One participant was in the 41-50 range and one in the 61-70 range. No participants reported being below age 31 or above age 70. The sample was evenly split by gender, with 6 makes and 5 females. All participants reported having at least a high school diploma, and the sample was distributed across available educational levels. Two reported having a high school diploma, eight reported having at least some college, and one held a master's or professional degree.

Volunteer Position, Duration, and Motivation. The most common volunteer position reported was "all" or "various" and during data collection several respondents reported having performed a number of volunteer roles. Volunteer duration showed a wide variety of responses, with six respondents reporting volunteer duration as one year or less, three reporting 1-2 years, 1 reporting 3-4 years, and 1 reporting ten years or more. The most common response regarding why the volunteers began their service at the center was professional development, with four respondents reporting this cause. However, the remaining seven respondents were spread across the other possible responses of having been a client at the center, seeing a flyer, and being asked by a friend to volunteer.

Treatment History. Only two respondents reported currently living in a recovery house. History of inpatient treatment for drug or alcohol addiction was split between the group, with six respondents reporting a history of inpatient treatment and five reporting no

such history. Similarly, six respondents reported a history of outpatient treatment and five reported no such history. However, it was not the same six respondents who attended both inpatient and outpatient treatment. Only four respondents reported both inpatient and outpatient treatment. Two respondents reporting receiving only inpatient treatment, two received only outpatient treatment, and three reported having no treatment history at all. Two respondents reported having received additional treatment not captured in earlier questions such as one-on-one counseling.

Recovery Status and Twelve-step Membership. Nine of the eleven participants considered themselves to be in recovery from drug or alcohol addiction. Seven of these also considered themselves members of a twelve-step recovery program, and all of these respondents also reported attending twelve-step meetings regularly. One person reported being a member of a twelve-step program but not in recovery from drug or alcohol addiction. Verbal reporting at the time of data collection verified that this was not an error but instead represented membership in a twelve-step program not directed at drug and alcohol recovery. Of those who considered themselves in recovery, six respondents reported less than one year of time clean/sober and five reported one year or more. Of those with more than one year clean/sober, two reported 1-2 years, one reported 3-4 years, one 5-10 years, and one more than 10 years.

Consensus: Respondent Beliefs

Repolarization. Consensus analysis with data from rating scales requires balanced numbers of positive and negative responses for accurate mathematical assessment. As described above, consensus analysis uses a measure of similarity between respondents on which a factor analysis is performed. When using data from rating scales, this measure of similarity is the correlation between each dyad's overall response profiles, specifically the Pearson r (Weller 1987). When item averages are clustered either above or below the scale

midpoint, the lack of variation suppresses the Pearson *r* and can therefore artificially suppress markers of consensus (Gatewood 2011).

Ideally this balance in item means is obtained by providing paired-opposite phrasings of the same idea such that agreement with one statement entails disagreement with the other (Gatewood and Cameron 2009: 57–58; Gatewood and Lowe 2008: 39). When this is not possible, as in the case of the current research, questions can be repolarized before analysis. The results from the participant's own beliefs survey yielded 24 out of 32 questions with a mean above 3, clearly violating the required equal balance. In order to repolarize, the propositions with means above 3 were listed in a randomized order and the first eight in the randomized list selected for repolarization. Randomization was achieved by assigning a random number generated by Microsoft Excel to each proposition with a positive mean and reordering the list by value of the random number. Each participant's score for the selected questions was repolarized (1 transformed to 5, 2 to 4, etc.) by use of a formula. The repolarized results were then submitted to consensus analysis.

Consensus Indicator	Value
First factor eigenvalue	4.469
Second factor eigenvalue	1.647
Ratio of first to second eigenvalues	2.714
Average first factor loading	0.626
Standard deviation of average first factor loading	0.119
Number negative loadings	0
Percent negative loadings	0%
n	11

Table 2. Respondent beliefs overall consensus

Overall Consensus*.* Consensus analysis was done using Anthropac software version 4.0 (Borgatti 1996). As seen in Table 2, no overall consensus was found. As described above, consensus analysis is a form of factor analysis, and consensus is considered to be present when (a) the ratio of first factor to second factor eigenvalues is no less than 3.5, (b)

average first factor loading is greater than 0.5, and (c) there are few, if any, negative first factor loadings (Gatewood 2012). The full sample produce a first to second factor eigenvalue ratio of only 2.714, indicating no overall consensus. However the other indicators of consensus were present, including a high average first factor loading of 0.626 and zero negative first factor loadings. The first factor eigenvalue is also high, explaining about 40% of the variation. This prompts an investigation of other factors which might be suppressing overall consensus. A low first to second factor ratio can be due to a random distribution of beliefs among the sample (a lack of consensus), but can also be due to competing subgroups whose divergent beliefs on some questions weaken the overall consensus. The second possibility is pursued here.

Subgroup Identification. Possible subgroups were identified in three ways. First, the second factor loadings produced by the initial consensus analysis were used to partition the group into those with positive second factor loadings and those with negative second factor loadings. Second, both hierarchical cluster analysis and Tabu search were performed using the same repolarized data used for the consensus analysis. The groupings produced by hierarchical clustering and Tabu search were identical, so those groupings are included as single partition method in Table 4, labeled "Clustering". Finally, the group was split between those who attended drug or alcohol twelve-step programs and those who did not.

Respondent	Clustering	Second Factor Loading	12-step Attendance
R1	1	1	2
R6	1	1	1
R8	1	1	1
R11	1	1	1
R2	2	1	2
R3	2	2	2
R4	2	2	2
R5	2	1	1
R7	2	2	2
R9	2	2	2
R10	2	2	2

Table 3: Respondent belief subgroups by partition method

Table 3 shows the group assignment of each respondent as determined by each of the methods. There is significant agreement among partition methods; eight of the eleven participants are identified in the same group across all partition methods. In order to test for the optimal partition, consensus analysis was run on each possible subgroup identified by the various partition methods. The results of this are seen in Table 4.

		Partition Method		
		Cluster Analysis	Second Factor Loadings	12-Step Attendance
Group 1	Ratio of 1:2 Factor Eigenvalue	12.207	6.177	5.266
	Average first factor loading	0.730	0.684	0.663
	Number of negative loadings	0	0	0
Group 2	Ratio of 1:2 Factor Eigenvalue	7.808	10.755	6.811
	Average first factor loading	0.727	0.755	0.682
	Number of negative loadings	0	0	0

Table 4: Respondent belief subgroup consensus results by partition method

Consensus is evident in all of the subgroups, as evidenced by ratios of first to second eigenvalues above 4, average first factor loading above 0.5, and absence of negative first factor loadings. However, the cluster analysis produced the strongest results, with the

highest first to second factor eigenvalue ratios and the highest average first factor loadings. A close examination of the respondent assignments indicates that the difference between the second factor loading groups and the cluster analysis groups is the placement of respondents 2 and 5. In all other assignments the two partitions agree. The partition by reported 12-step meeting attendance and partition clustering diverge on the placement of respondents 1 and 5. The close correspondence between partition by twelve-step membership and by cluster analysis suggests that twelve-step ideology may play a role in subgroup differentiation. Due to high consensus, partitioning based on cluster analysis is used.

Differences between Subgroups. To further investigate the differences between subgroups, the unadjusted means (not repolarized) for each proposition was compared between the subgroups specified by cluster analysis. Results are shown in Table 5. The difference between the means is listed, and is bolded if the difference is in direction as well as magnitude (one group agrees and the other disagrees). T-tests performed on the means shows *no statistically significant difference between subgroups.*

Despite the lack of statistical difference, it is interesting to consider which propositions produced the most difference in mean. Looking at the five propositions with the largest difference in means between the subgroups, it appears that the groups are split along the lines of the models of recovery. Group 1 disagrees with the four propositions that are positive markers of the Twelve-step Model and agrees with the one proposition that is a negative marker of it (see Table 1). The converse is true for Group 2. However, Group 1 agrees strongly with the proposition that the best method for recover is attendance at 12 step groups. Given the small sample size and the lack of statistical significance, it is impossible to know the true meaning (or spurious nature) of these observations.

Proposition	Group 1 Mean	Group 2 Mean	Difference
I believe addiction is a physical problem	1.50	4.57	**-3.07**
I believe addiction is a spiritual problem	1.50	4.29	**-2.79**
I believe some people can use drugs socially	2.00	4.14	**-2.14**
I believe addiction is a permanent condition	2.50	4.57	**-2.07**
Addicts and alcoholics become addicts and alcoholics by drugging or drinking too much	3.75	2.00	**1.75**
I believe anyone can develop alcoholism or drug addiction	4.75	3.00	1.75
Recovery can be defined as reducing the problems caused by drug and alcohol, even without completely stopping use	3.50	1.86	**1.64**
Addicts and alcoholics are psychologically different from non-alcoholic and non-addicted people	3.25	4.57	-1.32
Addicts and alcoholics are people who have lost the power of choice in drinking or drug use	3.25	4.43	-1.18
Addicts and alcoholics are people whose lives revolve around drinking or drug use	2.00	3.14	**-1.14**
Addicts and alcoholics are fundamentally selfish	2.50	3.57	**-1.07**
Addicts and alcoholics drink and use drugs primarily because of problems in their life	4.00	3.00	**1.00**
Recovery can begin when someone is still using or drinking	2.00	3.00	**-1.00**
Recovery is easier for a person with fewer problems in their life	1.75	2.71	-0.96
I believe anyone who drinks or uses drugs risks addiction	4.50	3.57	0.93
I believe a person experiencing problems due to drug or alcohol use is probably addicted	4.25	3.57	0.68
Recovery is best achieved by improving one's life	4.50	3.83	0.67
Recovery is best achieved by participation in a twelve-step program	4.50	3.86	0.64
Addicts and alcoholics can learn to use or drink in moderation	1.75	1.14	0.61
Recovery is best achieved through more self-discipline	3.75	3.14	0.61
Addicts and alcoholics can't stop once they start	4.00	4.57	-0.57
Recovery can be defined as complete abstinence from all drugs and alcohol	4.00	4.57	-0.57
Recovery is best achieved through learning coping skills	4.00	4.43	-0.43
I believe some people can drink socially	4.25	4.57	-0.32
I believe addiction is a psychological problem	4.25	4.57	-0.32
Recovery is only possible when someone hits bottom	3.00	2.71	0.29
I believe addiction is an illness	4.75	5.00	-0.25
Recovery is only possible when someone admits powerlessness	4.25	4.43	-0.18
Recovery can mean different things to different people	4.25	4.43	-0.18
I believe addiction is a moral problem	2.00	2.14	-0.14
Addicts and alcoholics were addicts or alcoholics before they ever took a drink or drug	3.25	3.14	0.11
Addicts and alcoholics can't stay stopped without help	4.25	4.14	0.11

Table 5. Differences in proposition agreement means between subgroups- respondent's own beliefs.

Consensus: Beliefs of Others

Repolarization. As noted above, an appropriately even distribution of positive and negative item means is needed to assure proper functioning of consensus analysis for rating scales. Responses regarding the perceived beliefs of others showed less positive skewing than respondent's beliefs, but repolarization was necessary. Repolarization was accomplished using the procedure discussed above. Interestingly, while no questions in the respondent beliefs had a mean of exactly 3, three questions had this mean in the beliefs of others responses. For the purposes of repolarization these were excluded and repolarization was conducted to balance the number of positive-mean and negative-mean questions.

Group Consensus. Consensus analysis of the repolarized responses showed overall consensus as evidenced by a first to second eigenvalue ratio of 3.571, an average first factor loading of 0.574, and no negative first factor loadings. Interestingly, despite the fact that consensus was clearly identified in this analysis, both the first factor eigenvalue of 3.861 and the average first factor loading of 0.574 are actually lower than those found in the analysis of respondents' own beliefs. This supports the idea that subgroup division on some items undermined the overall consensus indicators for the entire group in the analysis of respondents' own beliefs.

Consensus Indicator	Value
First factor eigenvalue	3.861
Second factor eigenvalue	1.081
Ratio of first to second factor eigenvalues	3.571
Average first factor loading	0.574
Standard deviation of average first factor loading	0.145
Number of negative loadings	0
Percent negative loadings	0%
n	11

Table 6. Others perceived beliefs overall consensus.

Subgroup Identification. Despite the overall consensus, a subgroup analysis was performed. This was done both because a relatively strong second eigenvalue was observed and in order that respondent's own belief consensus and perceptions of others' belief consensus analyses could be better compared.

Subgroup identification was performed as described for respondent belief. For the beliefs of others, hierarchical clustering and Tabu search techniques produced different subgroups, which are both reported here. As there was no reason to believe membership in a twelve-step program would produce differences in the perception of other volunteer's beliefs, that partition method was not tested. Therefore, the three partition methods shown in Table 7 are second factor loading, cluster analysis, and Tabu search.

Table 7 shows the subgroup assignments produce by second factor loading, hierarchical clustering, and Tabu search partitioning methods. It is interesting to note that these groupings do not match the groupings identified for the respondent's own beliefs for any of the partitioning methods. It is impossible to tell if this is due to differing influences or if it is due entirely to chance.

Respondent	Second Factor Loadings	Cluster Analysis	Tabu Search
R1	1	2	1
R5	1	1	1
R6	1	2	2
R8	1	1	1
R10	1	1	1
R11	1	2	1
R2	2	2	2
R3	2	2	2
R4	2	2	2
R7	2	2	2
R9	2	1	2

Table 7: Others perceived belief subgroups by partition method

As can be seen in Table 8, the subgroups identified by use of the second factor loadings produced the most robust results when the groups were tested separately for consensus. In all partition methods, the first subgroup loaded onto a single factor.

		Partition Method		
		Second Factor Loadings	Cluster Analysis	Tabu Search
Group 1	Ratio of 1:2 Factor Eigenvalue	Single Factor	Single Factor	Single Factor
	Average first factor loading	0.596	0.522	0.589
	Number of negative loadings	0	0	0
Group 2	Ratio of 1:2 Factor Eigenvalue	8.658	5.302	7.391
	Average first factor loading	0.725	0.669	0.694
	Number of negative loadings	0	0	0

Table 8: Others perceived belief subgroup consensus results by partition method

Overall the differences between means of the two groups is less dramatic than the differences between subgroups for respondent's own beliefs. As mentioned above, the whole group responses for perceived beliefs of others featured three questions for whom the whole group mean was 3, or neutral. Two of these questions appear in the top five differentiating propositions ("I believe addiction is a spiritual condition", which is number 2, and "I believe some people can use drugs socially", which is number four). The top proposition, "Addicts and alcoholics are people whose lives revolve around drinking or drug use", has a mean of 3.09 among the group as whole. This supports the idea that the presence of subgroups was causing a weakened overall consensus.

As with individual beliefs, the groups appear to split along ideological lines with Group 1 disagreeing with propositions that are a positive test of twelve-step ideology while Group 2 agrees. The split is not as clean as in respondent's own beliefs, however. The fifth most differentiating proposition is a difference of degree rather than direction, with Group 1 just over the 3.0 (neutral) mark while Group 2 agrees more strongly.

Proposition	Group 1 Mean	Group 2 Mean	Difference
Addicts and alcoholics are people whose whole lives revolve around drinking or drug use	2.17	4.20	**-2.03**
I believe addiction is a spiritual problem	2.17	4.00	**-1.83**
I believe addiction is a permanent condition	2.67	4.40	**-1.73**
I believe some people can use drugs socially	2.33	3.80	**-1.47**
Addicts and alcoholics are people who have lost the power of choice in drinking or drug use	3.33	4.60	-1.27
I believe addiction is a physical problem	2.83	4.00	**-1.17**
I believe addiction is a moral problem	2.67	1.60	1.07
I believe anyone who drinks or uses drugs risks addiction	4.00	3.00	1.00
Recovery is best achieved by participation in a twelve-step program	4.33	3.40	0.93
Addicts and alcoholics are psychologically different from non-alcoholic and non-addicted people	3.33	4.20	-0.87
Recovery is best achieved through more self-discipline	3.83	3.00	0.83
Recovery is best achieved by improving one's life	4.33	3.50	0.83
Addicts and alcoholics can't stay stopped without help	4.17	3.40	0.77
Recovery is only possible when someone admits powerlessness	4.33	3.60	0.73
I believe anyone can develop alcoholism or drug addiction	3.67	3.00	0.67
Addicts and alcoholics can learn to use or drink in moderation	2.00	1.40	0.60
I believe a person experiencing problems due to drug or alcohol use is probably addicted	4.00	3.40	0.60
Recovery can be defined as reducing the problems caused by drug and alcohol, even without completely stopping use	3.40	2.80	**0.60**
I believe some people can drink socially	4.00	4.60	-0.60
Addicts and alcoholics drink and use drugs primarily because of problems in their life	3.83	3.40	0.43
Recovery is easier for a person with fewer problems in their life	3.20	2.80	0.40
Recovery can be defined as complete abstinence from all drugs and alcohol	3.60	4.00	-0.40
I believe addiction is a psychological problem	3.67	4.00	-0.33
Recovery can mean different things to different people	3.67	4.00	-0.33
Recovery can begin when someone is still using or drinking	2.33	2.00	0.33
Addicts and alcoholics can't stop once they start	4.33	4.00	0.33
Addicts and alcoholics were addicts or alcoholics before they ever took a drink or drug	3.17	3.40	-0.23
Recovery is only possible when someone hits bottom	3.00	3.20	-0.20
Addicts and alcoholics are fundamentally selfish	3.00	2.80	0.20
I believe addiction is an illness	4.83	5.00	-0.17
Addicts and alcoholics become addicts and alcoholics by drugging or drinking too much	3.17	3.25	-0.08
Recovery is best achieved through learning coping skills	3.83	3.80	0.03

Table 9. Difference in proposition agreement means between subgroups – perceived beliefs of others

Given the small sample size, it is extremely difficult to determine if the observed differences reflect true differences of belief. Particularly in this analysis of perceived beliefs of others, many of the differences are small and conclusions cannot be drawn.

Network

As described in the methodology, the network survey contained a number of different relationship markers that were designed to allow many different types and depths of relationship to be captured. These were divided into subsets, called acquaintance markers, communication markers, and friendship markers. For analysis, several sums were used for network analysis.

Analysis was completed by producing visual representations of the networks using the software Netdraw (Borgatti 2002) and network statistics were calculated using the software UCINET (Borgatti, Everett, and Freeman 2002). The primary aims of the analysis were to characterize the overall density and centralization of the network and to calculate individual centralization scores for use in further analysis.

In the images of the networks included below, referred to as graphs, each respondent is shown as a node and relationships between nodes as shown as lines. The number of social ties a node has is called its degree. The arrowheads represent the direction of the reported relationship. Lines with arrowheads at both ends represent reciprocal relationships, in which both members of a dyad (pair of two respondents) reported knowing each other. Lines with arrowheads at only one end represent a tie in which only one member of a dyad reported knowing the other. One such case can be seen by looking at Figure 3 below. The uppermost tie coming from node R7 (this is Respondent 7) has no arrowhead pointing to R7 but does have an arrowhead pointing to R6. This signifies that Respondent 7 reported knowing Respondent 6 but Respondent 6 did not report knowing Respondent 7. This is an outgoing tie for Respondent 7 and an incoming tie for Respondent

6. The total number of outgoing ties for a node is the node's out-degree, and the number of incoming ties is the node's in-degree.

Dichotomous network. The simplest analysis was based on a dichotomous measure of relationship, i.e., whether any relationship is reported or not. Figure 3 shows the graph of such a network, where a line between two nodes indicates that some relationship marker was indicated. Nodes which are not connected by ties are dyads in which both parties reported not knowing the other.
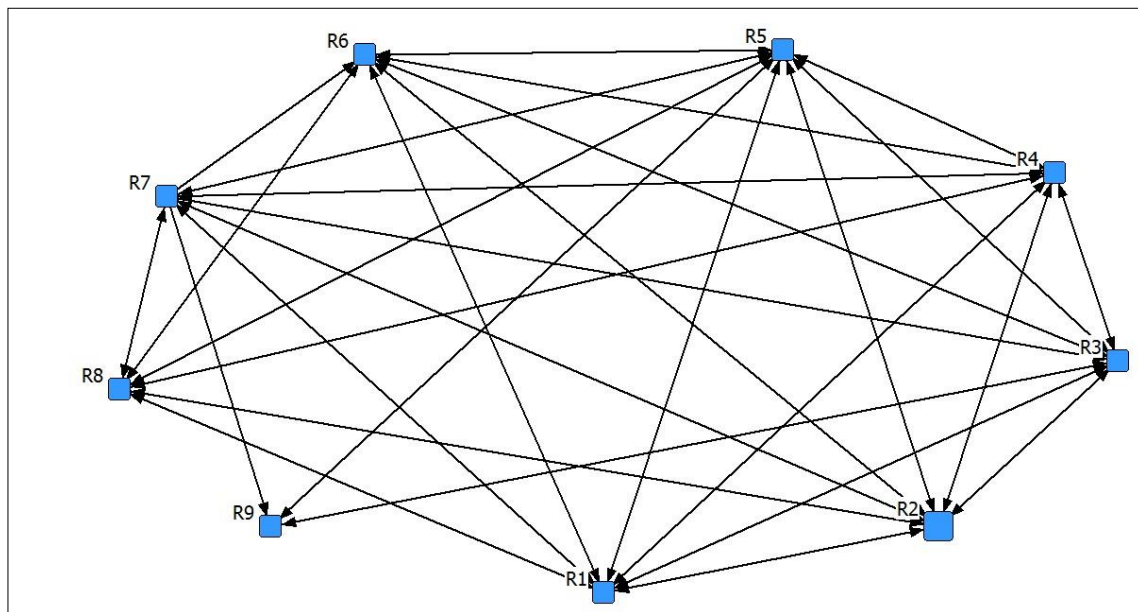
Figure 3. Dichotomous network graph

Figure 3 shows a dense network, meaning that there are numerous relationships between the nodes and most of the nodes have many ties with other nodes. Although useful, the visual representation of the network has limitations for understanding the ties between respondents and the overall characteristics of the network. A table listing the in-degree and out-degree also summarizes the relationships of each respondent and can provide an easier way to compare the number of reported relationships. The first two columns of Table 10 show the in-degree and out-degree counts for each node in this graph.

Respondent	Out-Degree (Raw)	In-Degree (Raw)	Out-Degree (Standardized)	In-Degree (Standardized)
R1	7	7	0.875	0.875
R2	7	7	0.875	0.875
R3	6	7	0.750	0.875
R4	7	7	0.875	0.875
R5	8	8	1.000	1.000
R6	6	7	0.750	0.875
R7	8	5	1.000	0.625
R8	6	6	0.750	0.750
R9	2	3	0.250	0.375
Mean	6.33	6.33	0.791	0.792
Standard Deviation	1.80	1.50	0.225	0.187

Table 10. Degree centrality in dichotomous network

Also included in Table 10 is the standardized in-degree and out-degree. This is a measure calculated by dividing the number of ties present by the total number of possible ties (Borgatti, Everett, and Johnson 2013). There is no absolute meaning to this measure as the score's meaning will depend on the total network size and the context (Borgatti et al. 2013). In this case, it is clear that most respondents have ties with most other respondents. In face the overall density for this graph (the total proportion of existing ties to the possible ties) is 0.792. This means that of all possible ties between members of the group, almost 80% are present. What kind of ties these are, however, cannot be determined from this graph.

Acquaintance ties. *.* Acquaintance ties include relationship markers that relate to basic social interaction such as having met, knowing the first name of, knowing the last name of, and volunteering with another respondent. Each tie has a possible value of 0-4, with 0 meaning no tie reported and 4 meaning each of the four possible markers of aquaintance are reported.
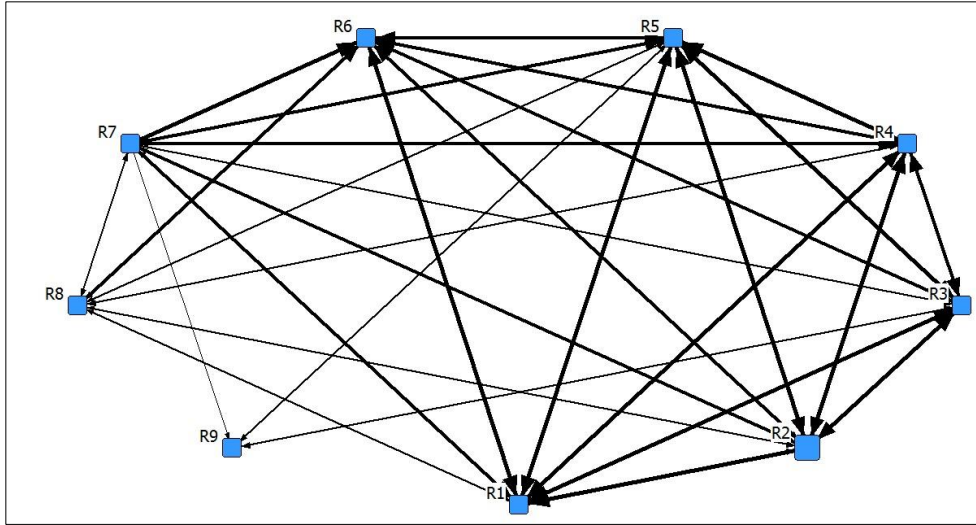
Figure 4. Acquaintance network graph

This graph closely mimics the binary graph discussed above, which is unsurprising given that "Have met" more or less captures the binary relationship information shown there. However, this graph also shows weighted ties, with wider lines and larger arrow heads representing stronger ties. This makes it easier to see that although there are many ties between all actors, not all actors are equally connected. Respondents 8 and 9, for example, appear to have weaker incoming ties (the other respondents report weaker ties with them).

Respondent	In-Degree (Raw)	Out-Degree (Raw)	In-Degree (Standardized)	Out-Degree (Standardized)
R1	17	25	0.531	0.781
R2	22	18	0.688	0.563
R3	19	20	0.594	0.625
R4	21	22	0.656	0.688
R5	23	25	0.719	0.781
R6	16	22	0.500	0.688
R7	21	10	0.656	0.313
R8	13	9	0.406	0.281
R9	4	5	0.125	0.156
Mean	17.33	17.33	0.542	0.542
Standard Deviation	5.94	7.45	0.186	0.233

Table 11. Degree centrality in acquaintanceship network

These observations are supported by Table 11, where degree is represented by the sum of tie strengths. The standardization is based on a possible total of 32, which would represent an individual having the maximum possible tie strength (4) with each of the other respondents (8). Respondents 8 and 9 have fewer ties and correspondingly lower standardized scores. Those two respondents aside, however, the differences in degree appear gradual and there are no respondents with uniquely high degree scores. As is visible in the graph, the network appears to have many connections with a low degree of centralization.

Technology ties*. Technology ties capture different ways respondents may communicate with one another. The relationship markers include phone number, text, phone calls, and Facebook. As with acquaintanceship ties, possible scores range from 0-4.
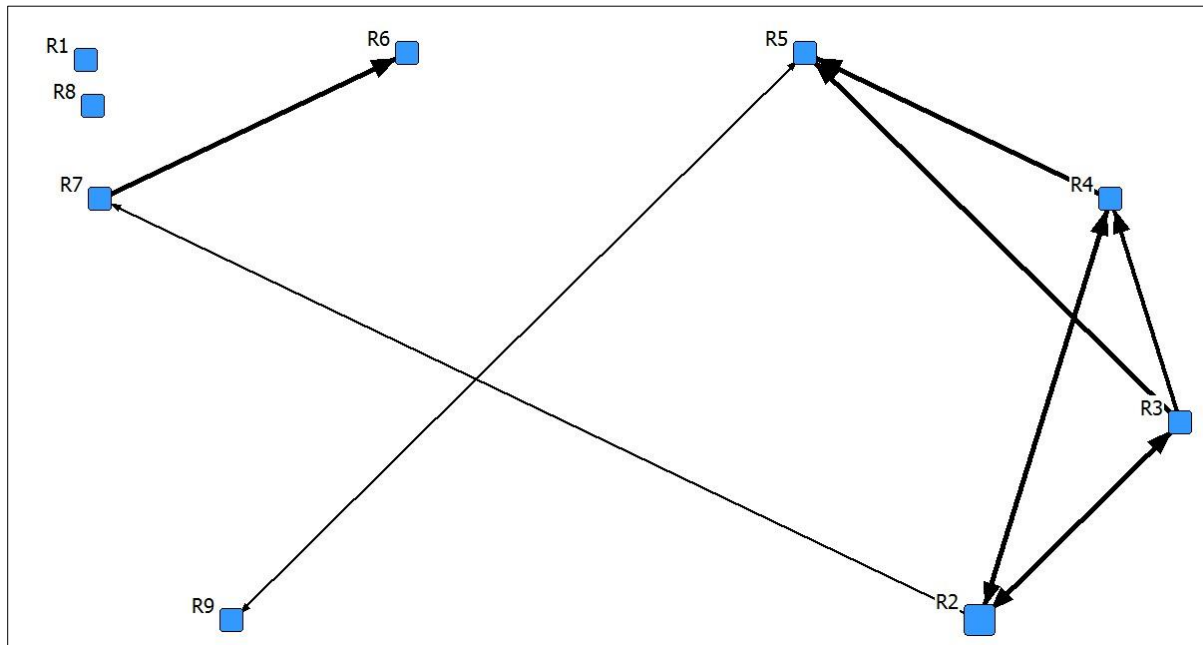
Figure 5. Technology network graph.

As seen in Figure 5, this network is much sparser than the acquaintance network, and some respondents do not have any ties with others. Here a smaller group of more connected nodes in visible (R2, R3, R4, R5). Table 12 supports this and the network does

appear more centralized than the acquaintanceship network, with those four nodes having

several times the proportion of possible weighted ties compared to the remaining nodes in

the network. However, in comparison to the acquaintanceship network this proportion is still

rather small. The overall mean weighted degree in this network is 3.33, which is a drastic

reduction from the mean of 17.33 in the acquaintanceship network.

Respondent	In-degree (Raw)	Out-Degree (Raw)	In-Degree (Standardized)	Out-Degree (Standardized)
R1	0	0	0.000	0.000
R2	8	6	0.250	0.188
R3	7	3	0.219	0.094
R4	7	10	0.219	0.313
R5	6	7	0.188	0.219
R6	0	1	0.000	0.031
R7	1	1	0.031	0.031
R8	0	0	0.000	0.000
R9	1	2	0.031	0.063
Mean	3.33	3.33	0.104	0.104
Standard Deviation	3.54	3.54	0.110	0.110

Table 12. Degree centrality in technology network

When considering the implications of the sparsity of this network, it is worth keeping

in mind that especially in this population there may be technological constraints to ties of

this type, namely the lack of a personal phone or access to Facebook. Therefore, this

network may not accurately reflect the extent of social ties among respondents.

Friendship ties*.* Friendship markers include giving and receiving support, spending

time together outside of the center, and considering the person a friend. Possible weighing

of ties is also on a 0-4 scale.
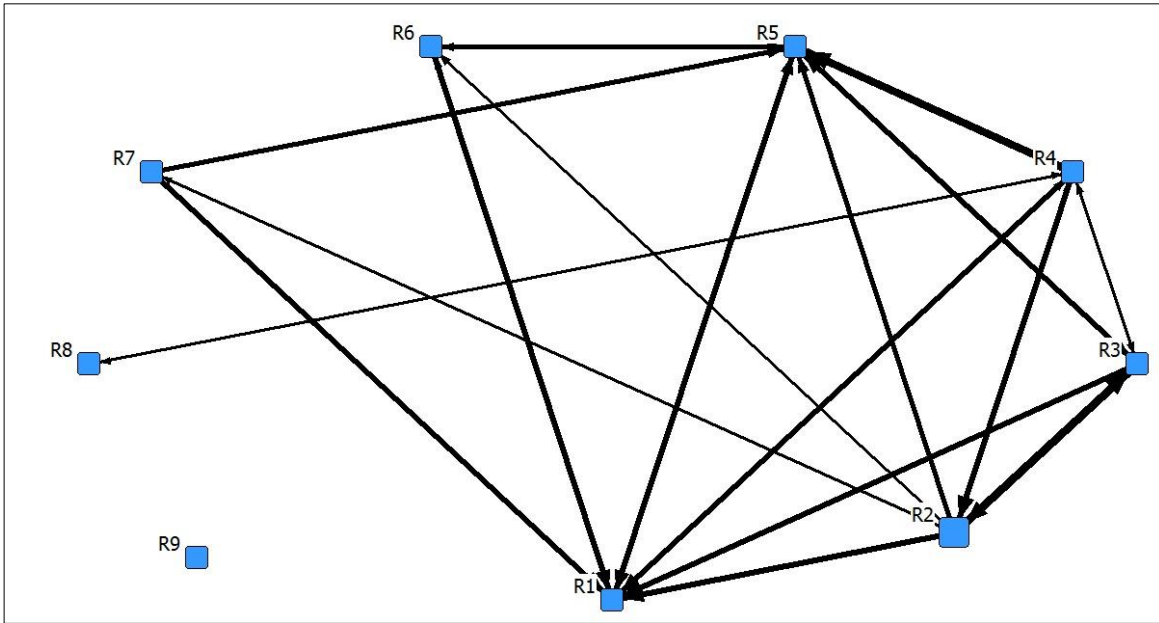
Figure 6. Friendship network graph

This graph falls between technology and acquaintance in terms of density of ties and variation in tie strength. Respondent 9, for example, is disconnected from the network and Respondent 8 has ties with only one other respondent. These two respondents also demonstrated relatively weak ties in the other networks examined. Respondent 1, who had no technological ties, is integrated strongly in this graph, lending further support to the idea that technological ties may not be good markers of social relationships in this group.

Respondent	In-Degree (Raw)	Out-Degree (Raw)	In-Degree (Standardized)	Out-Degree (Standardized)
R1	5	18	0.156	0.563
R2	12	6	0.375	0.188
R3	10	7	0.313	0.219
R4	12	6	0.375	0.188
R5	8	15	0.250	0.469
R6	5	3	0.156	0.094
R7	5	2	0.156	0.063
R8	1	1	0.031	0.031
R9	0	0	0.000	0.000
Mean	6.44	6.44	0.201	0.201
Standard Deviation	4.39	6.23	0.137	0.195

Table 13. Degree Centrality in Friendship Network

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These observations from the graph are supported by Table 13, where the average in-degree and out-degree, as well as the standard deviation, falls between the values found in the acquaintanceship network and those found in the technology network.

All Ties Analysis
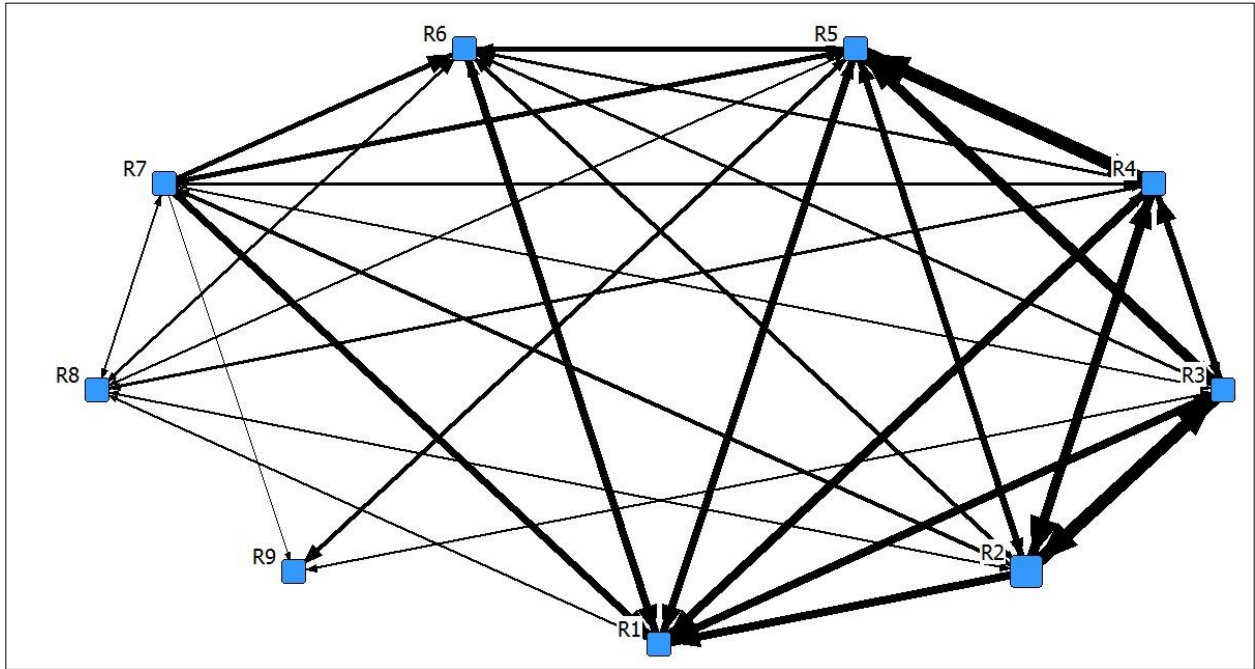
Figure 7. All relationship weighted tie network graph.

If the total number of relationship markers is tallied for each tie, a weighted graph can be assembled. In this graph, the range of possible tie strength is 0-12 and the total possible weighted degree is 96. Figure 7 shows this graph, with thicker lines representing ties with higher marker totals. In this graph it is clear that, while all respondents have ties with at least some other respondents, some relationships are clearly stronger than others and some respondents are more connected.

Respondent	In-Degree (Raw)	Out-Degree (Raw)	In-Degree (Standardized)	Out-Degree (Standardized)
R1	22	43	0.229	0.448
R2	42	30	0.438	0.313
R3	36	30	0.375	0.313
R4	40	38	0.417	0.396
R5	37	47	0.385	0.490
R6	21	26	0.219	0.271
R7	27	13	0.281	0.135
R8	14	10	0.146	0.104
R9	5	7	0.052	0.073
Mean	27.11	27.11	0.282	0.282
Standard Deviation	12.69	14.50	0.132	0.151

Table 14. Degree Centrality Total Weighted Ties Network

Tests for association were run between variables from the background survey and total weighted network degree (both in-degree and out-degree). No relationship was found between either in-degree or out-degree and demographic variables (age, gender, education), length of volunteer tenure, treatment history, status in recovery, or twelve-step membership.

In Table 14 respondents 2, 3, 4, and 5 again emerge as the most connected nodes, while respondents 1, 6, and 7 are moderately connected. Respondents 8 and 9 again emerge as the least connected nodes in the network. These patterns of connectedness appear across the different network types, but despite the arbitrary classification offered above, there is no clear single node or group of nodes that stands out as uniquely connected.

In sum, all the networks exhibited some variation in node centrality, but not a drastic or obvious division between central and non-central nodes. Networks such as the technology network were especially sparse and exhibited higher variation in weighted degree. The network of all weighted ties shows variation of node centrality as measured by weighted degree, but does not exhibit a highly centralized network overall.

Combined Analysis of Consensus and Network Data

The aim of this study was to test the hypothesis that an individual's placement in the network structure would be associated with their consensus scores. Since only 9 respondents participated in the network survey while 11 respondents participated in the consensus survey, consensus for respondent's beliefs was run using only the 9 respondents who participated in both in order to assure this factor did not alter associations observed. The results of the 9-member consensus can be seen in Table 15 and the subgroups assigned by second factor loadings can be seen in Table 16. The consensus results are very similar in magnitude, and the subgroup assignments are identical (the latter being especially interesting since different partition methods are used).

Consensus Indicator	Value
First Factor Eigenvalue	4.049
Second Factor Eigenvalue	1.461
Ratio of First to Second Factor Eigenvalue	2.771
Average Factor Loading	0.662
Standard Deviation of Average First Factor Loading	0.108
Number Negative Loadings	0
Percent Negative Loadings	0%
n	9

Table 15. Consensus among Network Participants

The overall group consensus was weak, so the individual first factor loadings (which represent an individual's representativeness of the group consensus) are suspect in both analyses. Nevertheless, correlation tests were run between degree and first factor loadings on respondent beliefs. In-degree, out-degree, and average degree (the average of in-degree and out-degree for each node), were each tested for

Respondent	Subgroup
R1	1
R2	1
R5	1
R6	1
R8	1
R3	2
R4	2
R7	2
R9	2

Table 16. Subgroup Assignment in Network Participants

correlation with first factor loadings. As seen in Table 17, the correlations are not

statistically significant (n=9) for any of the tests.

	Correlation with First Factor Loadings (Full Group)	Correlation with First Factor Loadings (Network Group)
In-degree	0.44	0.46
Out-degree	-0.20	-0.15
Average degree	0.11	0.15

Table 17. Correlation between degree and first factor loadings

Degree centrality is a good measure of centrality for this network primarily because

it can accommodate weighted, non-symmetrical ties. However, the number of connections

an actor has may not be the best measure of their influence on the ideas held by other

members of the network. Another way to measure centrality is to consider how "close" each

node is to all other nodes; that is, how many links it takes to get from a given node to each

alter (Borgatti et al. 2013:173). Information centrality is one measure of this closeness, and

it is designed specifically to capture the facets of network structure which are most

pertinent to the flow of information such as both the total number of paths present between

an actor and alter as well as their lengths (Hanneman and Riddle 2005). All of this

information is summarized in a single measure (Hanneman and Riddle 2005). As the

research questions investigated here center around beliefs and shared information, it

seemed appropriate to test a measure designed to capture network position as it relates to

information even though such a measure necessarily loses the nuance of non-symmetrical

relationships.

As information centrality requires symmetrical data (where all relationships are

reciprocal and have a single weight) so the total weighted tie network was symmetrized by

averaging the ties between each dyad (if actor A reported a total tie strength of 3 with actor

B, but actor B reported total tie strength of 5 with actor A, the symmetrized data matrix

represented their tie as having a weight of 4). The information centrality score for each

node is shown in Table 18.

Node	Information Centrality
R1	13.863
R2	14.172
R3	13.873
R4	14.620
R5	15.303
R6	12.292
R7	11.542
R8	8.736
R9	5.420

Table 18. Information Centrality Score

The results of this analysis were correlated with the first factor loadings from both the full group ($n=11$) and network-only (n=9) respondent's own beliefs consensus analyses. The results are show in Table 19 , and no statistically significant correlation was found.

	Correlation with Information Centrality
First Factor Loading ($n=9$)	0.08
First Factor Loading ($n=11$)	0.05

Table 19. Correlation between information centrality and first factor loading

Subgroup Analysis. Given that the overall consensus was weak, the original hypothesis of this study would predict that the subgroups identified as a result of consensus analysis would be apparent in the network data. As can be seen in Figure 8, this is not the case. Figure 8 presents the same network shown in Figure 7, but with nodes coded by subgroup. Nodes represented by white triangles are members of subgroup 1 as identified by consensus analysis of respondent's own beliefs and nodes represented by white squares are members of subgroup 2. The strong cross-subgroup ties in dyads R2/R3 and R4/R5 are the most visually apparent evidence of the lack of connection between subgroup membership and tie strength.

Attempts to replicate subgroup assignment using network data were similarly unsuccessful. The results of clique analysis are shown in Table 20. Clique analysis identifies all groups of nodes in which every node is connected to every other. In the whole network,

Clique	Members
Clique 1	R1 R2 R3 R4 R5 R6 R7
Clique 2	R3 R5 R7 R9
Clique 3	R1 R2 R4 R5 R6 R7 R8

Table 20. Results of clique analysis

three cliques were identified. None of the identified cliques resemble the consensus subgroups, either for respondent's own beliefs or perceived beliefs of others.

There is no reason that consensus subgroups need to be maximally connected, however, so faction analysis was also done. A faction within a network is a group which is connected internally but wholly unconnected to the rest of the members of the network. In a visual graph, it would appear as a separate cluster of nodes with no ties outside the faction. Network faction analysis produces a specified number of subgroups by attempting to arrange the nodes into groups that best replicate disconnected factions. Faction analysis on this network with two groups specified simply split out respondent 9 as a separate "group". When three groups were specified in an attempt to circumvent this, both respondents 3 and 9 were assigned their own groups and all other nodes were placed in the remaining group. Therefore this method also failed to replicate consensus subgroups.

Summary

Analysis of each survey was completed individually and the results were then compared. The background survey showed the sample was heterogeneous in terms of volunteer tenure and length of sobriety but largely homogeneous in terms of recovery status and twelve-step membership. The consensus analysis showed no overall consensus for the respondent's own beliefs, but was able to identify subgroups with strong internal consensus. The subgroups did appear to be differentiated by their opposite views on some propositions related to the twelve-step model, but only some tests of the model produced

disagreement. The network analysis showed a relatively dense network with little degree centralization, although degree centralization was greater in networks that mapped only the strongest relationship types. There was no correspondence found between network structure and results of consensus analysis, a finding that renders the original hypothesis unsupported by this study. Conclusions and avenues for future research are presented in the next section.

Conclusion

This study aimed to investigate the relationship between ideology and social relationships among those in the domain of addiction recovery. Despite the limitation of a very small sample size, it demonstrated that whole network data could be collected anonymously. It also demonstrated that, at least within one small group, disagreement existed regarding central questions of the nature, cause, and treatment of addiction.

Although the diagnosis and treatment of addiction has been primarily in the domain of psychology and biomedicine, sociology has insights to offer the study of addiction. Sociological theory suggests that health behaviors may be related to social group membership, an idea that is validated in the central role of mutual self-help groups in addiction treatment. Given their power to mediate ideology, the role of social groups appears especially important in a context of competing ideas about the nature, causes, and treatment of addiction.

This study used the tools of consensus analysis to analyze the beliefs about addiction held by volunteers at an organization offering recovery services and the tools of network analysis to map the relationships between those volunteers.

The consensus analysis demonstrated that even among a group with high levels of twelve-step group membership, disagreements existed regarding key elements of the twelve-step model of addiction. These disagreements were not associated with twelve-step membership status, treatment history, or any other collected demographic data. Clearly each member of this group felt that recovery and services to support it were important enough to warrant volunteering one's time, yet the exact nature of recovery was not uniform across the group. This suggests that further research on the beliefs about addiction held by people in recovery could be a fruitful line of inquiry. Identifying the working model of addiction, or the competing models available, directly from those in recovery might offer valuable insight to theorists and clinicians alike.

The consensus analysis on the perceived beliefs of others also demonstrated the presence of subgroups whose disagreement on some questions disrupted the overall consensus. However, the subgroups identified by the analysis of others' beliefs were different than those identified by the analysis of respondents' own beliefs. If this result is not purely due to chance, it suggests that different influences are active in shaping perceptions of others' beliefs than are active in shaping respondents' own beliefs.

The network analysis found a dense network of relationships that remained fairly robust even when only stronger friendship relationships were considered. Analysis of the overall network with ties weighted by tie strength suggests that the volunteers who participated in the study had multiplex relationships that extended beyond their interaction as volunteers. The network demonstrated neither uniquely central members nor clearly defined cliques. Without qualitative grounding, and given the very small sample size, it is difficult to know the significance of this overall structure.

The combination of the consensus and network data does not support the hypothesis that network placement would be associated with the representativeness of an individual's beliefs. Neither a single consensus nor a centralized network were found, and subgroup membership as identified in consensus analysis did not correspond with any identifiable cliques or differences in tie strength in the network. This may suggest that beliefs are not associated with social relationships in this domain, or that social ties related to volunteering are not the primary ties which influence beliefs. It may also be that the multi-pathway philosophy of the organization diminishes the association between social ties and beliefs. Further research would be necessary to clarify these possibilities.

This study had two primary limitations. The first was the inability to perform qualitative research in advance of constructing the questionnaires. It is not clear if the propositions presented in the consensus survey and the language used to present them reflected the working beliefs of the group being studied. It is therefore also unknown what impact this may have had on the results. Future research should undoubtedly begin with

such qualitative research so that a clearer picture of overall consensus, or lack thereof, can be gained. The lack of qualitative grounding also influenced the network survey, which contained elements related to technology that may not have been appropriate to the population. Here too an authentic understanding of the classification of relationships used by the target population and the language used to express that classification would have strengthened the survey and therefore the resulting analysis. In future research qualitative grounding should be a priority.

The second major limitation was the small sample size. This prevented the effective use of many statistical tests and further limited a study design already limited by a lack of random sampling. Future research should attempt to invest more time in recruitment and aim for more investigator involvement in that process.

Overall the results of this study did not support the initial hypothesis, but did suggest many avenues of future research. Taken alone, either the heterogeneity of beliefs regarding addiction among those in recovery or the collection of anonymous whole-network data could prompt further investigation, and taken together they point to a rich course of inquiry available among those in recovery from drug and alcohol addiction.

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Background Survey

☐ I have received and understand the Consent Form describing the risks and benefits of this study and how my responses will be protected and used. I am at least 18 years of age and I agree to participate in the study

☐ Other: _____

Your age:

☐ 18-25

☐ 26-30

☐ 31-40

☐ 41-50

☐ 51-60

☐ 61-70

☐ 71-80

☐ 81 +

You're Gender:

☐ Male

☐ Female

☐ Other/Prefer not to say

Your education:

☐ Less than HS Diploma

☐ HS Diploma

☐ Some College (no degree)

☐ Associates or Technical Degree (2yr)

☐ Bachelor's Degree

☐ Master's Degree, PhD, Professional Degree

Volunteer Position:

_____

How long have you been volunteering:

☐ 0-6 Months

☐ 7-11 Months

☐ 1-2 Years

☐ 3-4 years

☐ 5-10 years

☐ More than 10 years

☐ Don't know/Prefer not to say

Don't know/Prefer not to say

Why did you start volunteering with PRO-ACT (Choose One)?

☐ I was a client

☐ A friend asked me to volunteer

☐ Saw a flyer looking for volunteers

☐ Family member used services

☐ Professional development

Do you live in a recovery house?

☐ Yes

☐ No

Have you ever attended inpatient treatment (rehab) for a drug or alcohol problem?

☐ Yes

☐ No

Have you ever attended outpatient treatment (IOP, "Group") for a drug or alcohol problem, *outside of the Council*?

☐ Yes

☐ No

Have you ever attended a treatment not listed above for a drug or alcohol problem, *outside of the services offered at the Council*?

☐ Yes (please describe):

_____

_____☐ No

Do you identify as in recovery from drug or alcohol addiction?

☐ Yes

☐ No

If so, how long have you been clean or sober?

☐ 0-6 Months

☐ 7-11 Months

☐ 1-2 Years

☐ 3-4 years

☐ 5-10 years

☐ More than 10 years

☐ Don't know/Prefer not to say

Do you attend 12-step meetings on a regular basis?

☐ Yes

☐ No

Do you consider yourself a member of 12-step program?

☐ Yes

☐ No

Beliefs Survey

Consent: Please read the consent statement at the top of the first page and check if it is true. If you do not feel it is true please stop and ask for assistance.

Survey Instructions: The survey presents a list of statements about addiction and recovery that you are asked to consider. In the unshaded portion, check the box that best describes your own level of agreement with the statement. In the shaded portion, check the box which best describes what you believe the other participants here think about the statement. If you are unclear about how to fill out this questionnaire, please stop and ask for assistance.

Beliefs Survey

☐ I have received and understand the Consent Form describing the risks and benefits of this study and how my responses will be protected and used. I am at least 18 years of age and I agree to participate in the study

Addicts and alcoholics...	I think...					I think others here think...				
	Strongly Disagree	Disagree	Neutral	Agree	Strongly Agree	Strongly Disagree	Disagree	Neutral	Agree	Strongly Agree
Are people whose whole lives revolve around drinking or drug use	1	2	3	4	5	1	2	3	4	5
Were addicts or alcoholics before they ever took a drink or drug	1	2	3	4	5	1	2	3	4	5
Are people who have lost the power of choice in drinking or drug use	1	2	3	4	5	1	2	3	4	5
Become addicts and alcoholics by drugging or drinking too much	1	2	3	4	5	1	2	3	4	5
Can learn to use or drink in moderation	1	2	3	4	5	1	2	3	4	5
Can't stay stopped without help	1	2	3	4	5	1	2	3	4	5
Are fundamentally selfish	1	2	3	4	5	1	2	3	4	5
Can't stop once they start	1	2	3	4	5	1	2	3	4	5
Are psychologically different from non-alcoholic and non-addicted people	1	2	3	4	5	1	2	3	4	5
Drink and use drugs primarily because of problems in their life	1	2	3	4	5	1	2	3	4	5

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I believe...	I think...					I think others here think...				
	Strongly Disagree	Disagree	Neutral	Agree	Strongly Agree	Strongly Disagree	Disagree	Neutral	Agree	Strongly Agree
Anyone can develop alcoholism or drug addiction	1	2	3	4	5	1	2	3	4	5
Anyone who drinks or uses drugs risks addiction	1	2	3	4	5	1	2	3	4	5
A person experiencing problems due to drug or alcohol use is probably addicted	1	2	3	4	5	1	2	3	4	5
Addiction is a permanent condition	1	2	3	4	5	1	2	3	4	5
Some people can drink socially	1	2	3	4	5	1	2	3	4	5
Some people can use drugs socially	1	2	3	4	5	1	2	3	4	5
Addiction is an illness	1	2	3	4	5	1	2	3	4	5
Addiction is a moral problem	1	2	3	4	5	1	2	3	4	5
Addiction is a physical problem	1	2	3	4	5	1	2	3	4	5
Addiction is a psychological problem	1	2	3	4	5	1	2	3	4	5
Addiction is a spiritual problem	1	2	3	4	5	1	2	3	4	5

Recovery...	I think...					I think others here think...				
	Strongly Disagree	Disagree	Neutral	Agree	Strongly Agree	Strongly Disagree	Disagree	Neutral	Agree	Strongly Agree
Is only possible when someone hits bottom	1	2	3	4	5	1	2	3	4	5
Is only possible when someone admits powerlessness	1	2	3	4	5	1	2	3	4	5
Can begin when someone is still using or drinking	1	2	3	4	5	1	2	3	4	5
Is easier for a person with fewer problems in their life	1	2	3	4	5	1	2	3	4	5
Can be defined as complete abstinence from all drugs and alcohol	1	2	3	4	5	1	2	3	4	5
Can be defined as reducing the problems caused by drug and alcohol, even without completely stopping use	1	2	3	4	5	1	2	3	4	5
Can mean different things to different people	1	2	3	4	5	1	2	3	4	5
Is best achieved through more self-discipline	1	2	3	4	5	1	2	3	4	5
Is best achieved through learning coping skills	1	2	3	4	5	1	2	3	4	5
Is best achieved by participation in a twelve-step program	1	2	3	4	5	1	2	3	4	5
Is best achieved by improving one's life	1	2	3	4	5	1	2	3	4	5

Appendix C: Network Survey

Social Relationships Survey

Consent: Please read the consent statement at the top of the first page and check it if it is true. If you do not feel it is true please stop and ask for assistance.

Survey Instructions: For each of the other participants, please check the boxes which are true of your relationship with that person. For the first person enter your responses in the column labeled "Person 1", for the second person enter your responses under column "Person 2", etc. If you have any questions please stop and ask for assistance.

Social Relationships Survey

☐ I have received and understand the Consent Form describing the risks and benefits of this study and how my responses will be protected and used. I am at least 18 years of age and I agree to participate in the study.

I _____ this person	Person 1	Person 2	Person 3	Person 4	Person 5	Person 6	Person 7	Person 8	Person 9	Person 10
Do not know	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐
Have met	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐
Have volunteered with	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐
Know the first name of	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐
Know the last name of	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐
Have the phone number of	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐
Have texted	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐
Have called	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐
Am Facebook friends with	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐
Have spent time outside the center with	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐
Have received support from	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐
Have given support to	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐
Consider a friend	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐

I _____ this person	Person 11	Person 12	Person 13	Person 14	Person 15	Person 16	Person 17	Person 18	Person 19	Person 20
Do not know	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐
Have met	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐
Have volunteered with	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐
Know the first name of	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐
Know the last name of	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐
Have the phone number of	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐
Have texted	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐
Have called	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐
Am Facebook friends with	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐
Have spent time outside the center with	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐
Have received support from	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐
Have given support to	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐
Consider a friend	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐

I _____ this person	Person 21	Person 22	Person 23	Person 24	Person 25	Person 26	Person 27	Person 28	Person 29	Person 30
Do not know	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐
Have met	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐
Have volunteered with	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐
Know the first name of	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐
Know the last name of	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐
Have the phone number of	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐
Have texted	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐
Have called	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐
Am Facebook friends with	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐
Have spent time outside the center with	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐
Have received support from	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐
Have given support to	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐
Consider a friend	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐

Allison Ramsey-Henry

Education:
M.A. in Sociology: Lehigh University, August 2015
B.A. in Sociology: American Public University, August 2013

Experience:
Teaching Assistant, Lehigh University
September 2013- May 2015
- Assist in grading of assignments and exams
- Supervise student labs
- Assist students to achieve learning goals
- Provide input on exam questions
- Attend lecture and provide feedback as requested

Publications:
Ramsey-Lefevre, A. & Volpe, S. L. (2008) Assessment of Physical Fitness of Girls on the Go Program Participants. *Journal of Nursing Student Research*,1(2), article 4. Available at:
http://repository.upenn.edu/josnr/vol1/iss2/4

Skills:

- Trained in use of multiple literature databases, including JSTOR, Medline, CINHAL, ProQuest, and EbscoHost

- Basic knowledge of STATA , UCINET, Anthropac