EXPLORING SOCIAL NETWORKS OF DRUG OFFENDERS ON PROBATION

by

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ABSTRACT

EXPLORING SOCIAL NETWORKS OF DRUG OFFENDERS ON PROBATION

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Social networks represent one dominant mode that drug use thrives in society by providing users with access to drugs and by offering social support for use. This study extends prior social network research by measuring the influence of family relations and the impact of treatment participation on social networks for a sample of drug offenders on probation with a treatment condition in Baltimore County, MD. After randomization into a group either receiving treatment within the probation office or referral to a community treatment program, offenders are surveyed pre-treatment and three months later using the Addiction Severity Index, the Client Assessment Inventory, and the Orientation of Social Support measure with responses forming key variables for analysis. Findings show that positive family relations and attending treatment lead to larger social support networks but have little effect on the negative networks of the offenders. Policy implications may include probation officers trying to incorporate offenders' family members into meetings or discussions and more social network oriented treatment programs for offenders.

1. INTRODUCTION

Social networks have been identified as one of the key means by which drug use proliferates in society, yet little is established about the networks of known drug users (Latkin et al., 1995). Social networks are a structure of individuals tied together by relationships (Krohn, 1986). These social relationships may influence a person to use drugs, to cease drug use, or to engage in any activity. Therefore, social network analysis is a tool that is gaining popularity in explaining social network compositions, relationships, and positive and negative behaviors.

Nearly 7 million adults are involved in community supervision and over half have treatment conditions (Taxman et al., 2007). However, treatment programs struggle with how to assist offenders in addressing their drug use and how to change their lifestyles to reduce the risk of continued drug use. Social network treatment approaches may involve altering offenders' friends and families. Therefore, treatment programs can be assessed on their ability to remove social network relationships conducive of drug use and on their effectiveness to produce social networks opposing drug use. Researching these treatment programs can show how social networks positively affect drug addicted offenders. The purpose of this study is to describe and analyze the social networks of known drug addicted offenders on probation and to determine how treatment participation impacts social networks.

Introduction to substance abuse

Drug addiction in the United States presents a serious problem at the individual and societal levels. Addiction is the compulsive use of a substance despite negative and potentially severe consequences. Drug addiction affects the brain leading to a chronic relapsing brain disease that involves patterns of increasing levels of substance use resulting in health consequences or impairment in social, psychological, and operational functioning (National Institute on Drug Abuse (NIDA), 2006). Scientific evidence reveals that drugs interfere with normal brain functioning creating a powerful feeling of pleasure and problematically inflicting long-term effects on the brain's metabolism and activity (NIDA, 2007). In addition to neurological changes in the brain from abuse of the substance, the complex drug dependency process includes family and peer influences, personality, and cultural or social factors that are focused on later in the paper (NIDA, 2006). Despite the fact that drug use may originate by choice, the multifaceted route of drug addiction draws from uncontrollable aspects of a person's functioning processes and environment.

Although the exact size of the drug addict and drug-using populations are unknown, the Substance Abuse and Mental Health Services Administration (SAMHSA, 2007) estimates 17.9 million illicit drug users over the age of 18. An estimated 22.5 million people over age 12 classify as having substance dependence or abuse problems with 15.5 million people dependent on only alcohol, 3.8 million people dependent on only drugs, and 3.2 million people dependent on both (SAMHSA, 2007).

Comparing genders, males use drugs at a higher rate than females, but drug use across races (whites, blacks, and Hispanics) is remarkably stable around 10 percent (SAMHSA, 2007). Young adults compose the highest drug-using age group with 19.8 percent of the population using drugs (SAMHSA, 2007). Also, 18.5 percent of the unemployed adult population currently uses illicit drugs (SAMHSA, 2007). However, 75 percent of drug users are employed either full or part time. The portion of the population using or dependent upon drugs varies by age, race, gender, and employment illustrating the range of people that fit a drug-using profile.

Along with the dangers of addiction to an individual, the costs of addiction burden society. Substance abuse (alcohol, tobacco, and drugs) costs the United States over 484 billion dollars a year (NIDA, 2007). The economic cost of drug abuse alone is around 109.6 billion dollars a year. Approximately 58 percent of the drug abuse cost results from crime, as alcohol and drug use relate to many offenses. Thirty-three percent of state inmates and 22 percent of federal inmates test positive for drugs at the time of their arrests. For probationers, 40 percent are under the influence of alcohol and 14 percent are using drugs at the time of arrest (Mumola, 1998). Additionally, of the 35 cities participating in the Arrestee Drug Abuse Monitoring study, half of the cities report 64 percent or more of the male arrestees testing positive for illegal drug use (National Institute of Justice, 2003).

Offenders on probation and parole have higher levels of drug use than the general population. According to a national survey, 4.6 million adults were on probation and 1.6 million adults were on parole in 2006 (SAMHSA, 2007). From this population, 31

percent of probationers are current drug users, and 39.7 percent of probationers depend upon or abuse a substance. Sixty-six percent of probationers are involved in alcohol or drug abuse in the time leading to their arrest. Of parolees, 29 percent are current drug users, and 36.9 percent of parolees depend upon or abuse a substance (SAMHSA, 2007). Additionally, the percentage of offenders successfully completing supervision has decreased in the past decade from around 70 percent to 57 percent (Bureau of Justice Statistics, 2006). A large part of this decrease is failure to abide by release conditions; the most violated conditions are abstinence from substance use and participation in treatment (Bureau of Justice Statistics, 2002). In 1990, one-fifth of the population needing substance abuse treatment was on probation or parole (Institute of Medicine, 1990).

Oftentimes, since the probation and parole populations are under the control of the criminal justice system, treatment is a mandated condition for supervision. According to Mumola (1998), 50 percent of probation sentences include court ordered commitment to drug or alcohol treatment. Mandating treatment to successfully complete supervision terms may reduce the probation and parole drug addict populations. Offenders facing legal pressure to attend treatment have as good or better results than people entering treatment voluntarily, but challenges to place and enforce program attendance for these offenders remain unresolved in practice (NIDA, 2006).

Treatment Programs

As an attempt to deal with the problem of addiction, drug treatment programs are implemented in society. Of the population age 12 and older, 23.6 million people or 9.6

percent of the population need treatment for drugs or alcohol (SAMHSA, 2007). Need for treatment depends on consumption patterns and the seriousness of associated consequences (Robert Wood Johnson Foundation (RWJF), 2001). While a large demand for treatment exists, only 4 million people received treatment in 2006 exposing that treatment provision remains a recognizable problem (SAMHSA, 2007).

Treatment programs tend to be community based. Offenders often partake in traditional outpatient programs or drug education and counseling (Taxman et al., 2007). Other substance abuse program types include specialty facilities, self-help groups, and publicly funded programs (SAMHSA, 2007; NIDA, 2005). Drug abuse education and awareness programs are the most commonly offered substance abuse services for offenders followed by low-intensity group counseling of less than 4 hours a week (Taxman et al., 2007). However, only 109,000 prisoners, 86,000 jail detainees, and 331,000 offenders under community supervision receive these treatment services daily (Taxman et al., 2007). Without treatment, substance abusing offenders are likely to repeat the same behaviors that led to their criminal status (Harrison, 2001).

Unfortunately, the present treatment programs are not without problems. According to Simpson et al. (1997), about half of enrollees drop out of treatment. For others, relapse rates are 40-60 percent. These numbers could decrease with new information on how to improve treatment programs (McLellan, 2000). Currently, the best treatment programs offer a greater range, frequency, and intensity of services as a flexible approach to individual treatment (RWJF, 2001). Drug treatment services focusing on developing insight, skills to manage drug-using behaviors, and prosocial or

non drug-using social networks are less likely to be available (Belenko & Peugh, 2005). Emphasis on adopting the factors known to show success into treatment programs provides a future objective for treatment research.

One new direction for treatment programs is recognizing the impact of social networks (Schroeder et al., 2001). Social networks add a new dimension to treatment programs portraying a more accurate view of drug abuse and allowing the problems abusers face to be better understood and treated. Social network analysis entails focusing on family, friends, and associates of drug users by emphasizing that drug use is not simply an individual characteristic, but that other factors within a person's life influence drug use. Therefore, by targeting the problem within one's self and the problems associated with drug-using peers, treatment programs offer a more complete method for ceasing drug use.

Conclusion

Drug abuse presents an unyielding multi-dimensional problem to individuals and society. One of the major costs of drug abuse occurs through crimes committed by users. Additionally, the problem of drug abuse remains sizable and drug use impacts a diverse range of individuals. Included in the drug abusing population are a large number of offenders on probation and parole. As a condition to an imposed sentence, probationers can be mandated to attend treatment by the criminal justice system. However, attendance is poor, availability of treatment programs is limited, and treatment programs have high failure rates. According to Taxman et al. (2007), treatment services are provided less frequently to criminal justice offenders in community settings than in incarceration

facilities, and offenders under community supervision have less access to the available services. Increasing treatment opportunities and effectively lowering the number of addicts through treatment reduces the problems illustrated when considering the larger scope of drug addiction.

The statistics outlined in this section exemplify the overall problem of drug abuse, the drug addicted probation population, and the demand and availability of treatment programs. Briefly mentioned is the idea that drug addiction extends beyond neurological changes and is impacted by family and peer influences, personality, and cultural or social factors (NIDA, 2006). These are important aspects to incorporate into an understanding of drug addiction. The following sections of this paper examine these influences of family, peer, and social factors in the form of a social network on offenders to enroll in drug treatment programs while on probation. Findings from this study represent a means of reducing drug addiction for probationers through treatment programs and social network alterations.

2. LITERATURE REVIEW

Theoretical Perspective of Social Networks

Major Theoretical Considerations for People and Social Networks

Approaching social networks from a theoretical perspective considers why an individual resides in a certain social network, what drives an individual to or from a network, and what the individual gains from the network. Criminological theories relevant to social networks include social learning theory, social control theory, life-course theory, and interactional theory. Different social network perspectives provide contrasting ideas as to the formation of social networks and what the composition of a network signifies for an individual. Clarifying the foundation of social networks allows for a better understanding of drug addiction and understanding the interaction between treatment and social networks.

Theories applicable to the discussion of social networks of drug offenders are social learning theory and differential association. Under these theories, reinforcement from others, learning definitions that are favorable to crime, and imitating or modeling deviant acts of others influence offenders (Sutherland & Cressey, 1978; Akers, 1985). During the learning process offenders absorb attitudes of acceptable behavior from their social networks through a system of positive and negative reinforcements and interactions. Factors impacting learning include the amount of time offenders spend with

deviant others, their exposure to crime, their level of network commitment, and how important the offenders view the dominant figures within the social network (Warr, 1993). Other circumstances affecting learning are variations in social structure, culture, and the location of an individual within a social system or network (Lee et al., 2004). The concept of learning is complex and draws from various sources within a social network. However, the dominant influences form the main beliefs of appropriate behaviors.

Differential association considers how individuals learn to become criminals but not why they become criminals. Individuals chose criminal paths when the balance of definitions for law-breaking exceeds those for abiding the law (Sutherland, 1947). Criminal behaviors are reinforced if social associations provide criminally active people in a person's life. The principal concept of learning criminal behavior occurs within intimate personal groups through the process of communication (Sutherland, 1947). Surrounding oneself with negative influences makes partaking in criminal behavior socially easier for the individual.

The learning process depends on those people with the greatest influence in one's life such as parents, peers, a spouse or partner, other family, and coworkers (Akers, 1985). A life-course perspective identifies varying influences as a person ages implying the need to consider age and life events when looking for dominant network members in the learning process. For example, in adulthood, marriage or pro-social coworkers may disrupt previous deviant peer networks initiating new attitudes and behaviors (Sampson & Laub, 2005). Furthermore, by examining the composition of social networks, patterns

may surface revealing that offenders stay at the strong peer phase of adolescence where the continuance of deviant behavior is more acceptable. This violation of expected life-course transitions combined with learning processes helps account for some behaviors. Considering a life-course perspective with regard to social learning, results in pathways that create positive and negative social networks.

On the other hand, social control theory relies on a person's bonds to conventional or non-conventional values in society for determining behaviors (Sampson & Laub, 1993). Social network analysis reveals whether an individual maintains conventional bonds, such as parents, a spouse, or pro-social coworkers. Those individuals unable to formulate conventional bonds lack social control and are pushed into non-conventional groups. When examining different bonding characteristics, important variables are attachment to networks, commitment to networks, belief in conventional values, the degree of conflict, and the stability of bonds (Krohn & Massey, 1980). These variables may explain why a person acts in a conventional manner or in a non-conventional manner. Also, other positive ties with conventional society exist through institutions such as school and work, or negative relationships form to non-conventional institutions like prisons and jails impacting social networks (Sampson & Laub, 1993). Social bonds explain behavior through the ability to maintain strong associations with others. A lack of association with others or conventional social ties results in deviant behavior.

Social control theory relates to delinquency in the sense that delinquents fail to form the conventional bonds of adults in society and are therefore more prone to committing criminal behaviors (Hirschi, 1969). However, as a person moves into

adulthood, most adults are not criminals implying that conventional social bonds are strengthened as a person ages from changes that occur over the life course (Hirschi & Gottfredson, 1983). Newly forming conventional bonds illustrate transitions in influential people or associations within a person's life.

Mentioned as part of social learning and social control theories is a life-course theory based on the social influences of age-graded transitions and life events (Sampson & Laub, 1992). With aging, the influential people in one's life transition in a fairly regular pattern. During childhood, parents hold the greatest influence. This emphasis shifts toward peers during adolescence and transitions again in early adulthood to a spouse or coworkers. Corresponding with these relationship transitions, crime curves show that offending peaks in the teenage years and declines in early adulthood (Moffitt, 1993). This illustrates that during adolescence parental influences decrease leading to an increase in crime. The trend captures the changing impact of peer relations for understanding offending patterns (Warr, 1998).

Life-course theory includes the continuities and discontinuities of behaviors resulting from events that occur during a person's life (Sampson & Laub, 1992). Life-course theory outlines a life path determined by a predicted trajectory (Warr, 1998). Anti-social behavior, deviant acts, and other events of childhood and adolescence form these trajectories projecting the lifestyle paths of offenders in adulthood. The trajectory incorporates events capable of influencing the length and persistence of an offender's career (Farrington, 2003).

However, according to Sampson and Laub (1992), these trajectories are not set paths. Sampson and Laub (1992) introduce the concept of a "turning point," where the possibility exists that at any point in a person's life an event may occur that alters the life-course trajectory. Taking a more flexible approach to life-course theory allows the duration, timing, and ordering of events to affect the trajectory. Events include positive incidents, unexpected stresses, and the unlikely occurrences of death or victimization. Also, considering events within a single trajectory examines influential turning points within an individual's life. Life-course theory relies on models to determine an offender's trajectory and continuance of deviance, but redirection from turning point events cannot be ruled out.

One final theory discussing the social networks of drug offenders is an interactional theory (Menard & Elliott, 1994). This theory encompasses a combination of theories to explain an individual's social network. The first incorporated theory is social control theory and the weakening of bonds from conventional society (Thornberry et al., 1994). For a drug offender, the removal of conventional bonds is a pull away from those people who oppose drug use and crime. The openings from lost conventional bonds are filled by other drug users or criminal influences (Krohn et al., 1996). Also, integrated into interactional theory is social learning theory providing an environment for learning negative behavior. Using drugs may attract other drug users to the individual creating attitudes and behaviors conducive for drug use. Social control theory and social learning theory present a causal relationship between drug use and those members of a social network that use drugs. This theoretical relationship suggests that drug use results from

bonds with other users and that an individual's drug use draws similar individuals inward offering reinforcement favorable to drug use (Krohn et al., 1996).

Last, interactional theory includes the contexts of life-course theory. While social control theory and social learning theory predict a person's drug use, events do occur that could drastically change this habit (Thornberry et al., 2003). The relationship between age and influential people is relevant to interactional theory. While a reciprocal relationship may exist between drug addicts and social networks of drug addicts, growth away from non-conventional networks in adulthood could result from turning points or transitions of life-course theory.

In summary, social learning theory, social control theory, and life-course theory introduce theoretical foundations for describing the impact of social networks on drug offenders. Social learning theory assists in demonstrating how addicts develop attitudes and behaviors favorable for drug use. Social control theory eludes that non-conventional bonds result in drug-using behavior. Pertaining to drug offenders, life-course theory uses deviant social networks in predicting a continued path of drug use. Last, interactional theory shows how the combination of theories may present the most logical basis behind an offender's social network and related drug-using behaviors. Currently, no solid evidence exists favoring one theory over the others. Studies on social networks of drug users provide varied findings leaving room for future analysis. Also, theoretical perspectives of social networks provide the underlying basis of why and how social networks form in the manner that they do. Network structure and the contrasting

perspectives of social control theory and differential association theory are discussed in the section below.

Major Theoretical Considerations for Social Network Characteristics

Social control theory and differential association theory offer vastly different perspectives on social network characteristics. Empirical evidence exists for both theories when analyzing the structural dimensions of social networks. However, clear evidence does not fully support either theory indicating the possibility that the theories coexist and contribute to understanding social networks. The following section introducing the theoretical perspectives is from Fraser & Hawkins (1984a).

In social control theory, the basis of social networks is that people are inadequately socialized to conventional society leading to nonconformity with the shared cultural values of society. Social bonds to society create involvement in legitimate activities, commitment to legitimate pursuits, attachment to non-deviant others, and the adoption of the shared beliefs and values of society. Lacking these social bonds initiates deviance or increases the likelihood of deviance.

Specifically, drug use is associated with fractured interpersonal relationships and increasing vulnerability to situational enticement. For drug use to occur, poor socialization is the necessary and sufficient condition. Social networks are distinct in structure, interaction, and content from conventional society. Drug users' social networks contain drug users and a substantial portion of non-drug users. Due to limited social skills and weak bonds, relationships are unreciprocated, shorter in duration, less hierarchical, less cohesive, less intense, less dense, more single stranded, and not

characterized by role modeling. Smaller network size is expected because of the inability to develop and maintain relationships. As a result of the lack of attachment to members, relationships are identified better as cold and brittle associations. Rehabilitation approaches for social control theory develop new bonds that provide a stake in conformity.

On the other hand, for social networks under differential association theory, the process of socialization is the same in deviant and non-deviant groups of society. The deviant networks are structurally and interactively similar to conventional social networks. Deviance results because behavioral norms in some subgroups of society are so varied that the standards of the subcultures are inherently deviant compared to the dominant conventional society. In some subgroups, conflicts develop between the values of subcultures and the values of the more powerful culture.

Deviant behavior, such as drug use, arises from the exposure to others and the subsequent imitation or modeling of others' actions. Drug use develops from both poor socialization to society-at-large and socialization to deviant values. Drug users' social networks are mainly composed of members who use drugs or are favorable to drug use. As a consequence of strong bonds, relationships are reciprocated, longer in duration, more hierarchical, more cohesive, more intense, denser, less single stranded, and characterized by role modeling. Rehabilitation focuses on disconnecting users from network members with deviant social definitions and on forming bonds to a new set of values and networks.

In the following sections describing what we know about social networks, social network characteristics, structure, and composition, aspects of social control theory and differential association theory are visible. Oftentimes, different studies focusing on the same topic result in contrasting views of an appropriate theory.

What is known about social networks of addicts and offenders?

Social networks define individuals by identifying roles and relationships of members that help explain behaviors. The degree of influence from network members, social integration into networks, and the level of network participation provide insight into the actions and rationale of individuals. The characteristics of social networks constrain and enable individuals to take part in conventional and non-conventional activities (Krohn, 1986). This occurs because some social network connections support patterns of conventional behavior, while other connections support patterns of deviance. To understand support roles implies continuing analysis of social networks (Schroeder et al., 2001).

A group potentially benefiting from social network analysis is drug abusers (Latkin et al., 1999). Focusing on the behaviors that develop from interactions among social networks and associates could explain habits of use. Studying social networks is a logical extension of efforts to specify the cause of drug abuse (Fraser & Hawkins, 1984a).

During adolescence, peers within a person's social network gain increasing power becoming highly persuasive over an individual's actions. Studies reveal that delinquent peer networks influence drug use and that drug use attracts delinquent peers (Thornberry et al., 1994). Another common theme in adolescence is co-offending as most offenses

are committed with others, and those adolescents committing offenses alone often act under peer pressure (Giordano et al., 1986). However, in a study of adolescent friendship networks of different level delinquent groups, Giordano et al. (1986) find that youths generally have similar friendship levels of involvement and stability and derive a variety of benefits from their relationships. Differences for friendship networks of higher delinquency are characterized by greater degrees of conflict, greater levels of peer pressure, and higher rates of youth looking to reap extrinsic rewards. While family and school act as informal social controls during this stage of life (Sampson & Laub, 1993), the overwhelming influence on an adolescent results from peer networks and associations.

As adolescents transition into young adulthood, exposure to delinquent peers tends to decrease (Warr, 1993). According to Warr (1998), one reason for this transition is that marriage reduces time spent with former peers or criminal associates. Furthermore, a finding by Wright and Cullen (2004) perceives that prosocial coworkers disrupt previous relationship ties with delinquent peers. These studies support the finding by Sampson and Laub (1992) that marriage and jobs modify social networks. Other informal social controls reappearing in young adulthood altering social networks are family, college, and trade schools (Sampson & Laub, 1993). Also, co-offending decreases with age primarily because offenders change internally and not because of selective attrition of co-offenders (Reiss & Farrington, 1991). Findings indicate that in young adulthood some primary social network members, typically peers, are likely to be replaced.

A strong indicator for an individual continuing drug use into adulthood is drug use within that person's social network (Schroeder et al., 2001). In a meta-analysis of predictors of continued drug use, Brewer et al. (1998) find that associating with substance abusing peers is among the ten significant variables that longitudinally predict continued drug use. Reviewed in Brewer et al. (1998) are two concurrent and two longitudinal studies referring to social interaction with substance abusers or the number of friends and intimates who are substance abusers. According to Schroeder et al. (2001), drug use by members of the social network is a stronger predictor of continuing drug use than neighborhood characteristics or arrests. Also, the presence of drug users in the network more strongly associates with a participant's drug use than any beneficial effect derived from the participant's social network (Schroeder et al., 2001).

The more delinquent peers who are located in a person's network, the more likely that person is to be delinquent (Akers, 1985). Higher levels of peer deviance positively relate to rearrest (Broome, 1997). For example, according to Leonard (2000), heavily drinking men are predicted to reoffend more than those men classified as drinking less alcohol. Correspondingly, heavily drinking men have criminal social networks with drinking buddies as 75 percent of the members. The greater the degree of a person's drug involvement increases the chances that friends have similar patterns of drug use (Kandel & Davies, 1991). Therefore, addicts who keep deviant friends a priority often continue using drugs.

For social networks with at least one drug user, Goehl et al. (1993) find that subjects have a mean of 63 percent positive urines, while subjects without drug-using

network members have a mean of 34 percent positive urines. Methadone maintenance patients provide a baseline measure of social support and drug use in their social networks and are followed for three months with weekly drug tests (Goehl et al., 1993). Those patients removing drug users from their social networks upon entering treatment increase their chances of abstinence, whereas drug users remaining within the social networks act as environmental cues eliciting cravings and withdrawal symptoms that trigger relapse for patients (Goehl et al., 1993). The presence of drug users and the degree of drug use deeper entrenches the drug network in a dominant role.

Conflict within social networks affects drug use. Tobin et al. (2007) find that increases in the number of network members with conflicting ties or those network members with tense or strained relations marginally correlates with increased overdose risk. In accordance, Latkin et al. (2004) show that larger numbers of conflicting ties among network members significantly associates with drug overdose. Both studies examine injection drug users. Problems and conflict cause an imbalance in relationships producing increasing drug use (Giordano et al., 1986).

Conversely, gaining social network members that function in a positive supportive role prevents drug-using behaviors and potentially influences ending drug use (Latkin et al., 2004). Likewise, cessation of drug use correlates with a lower proportion of drug-using network members (Latkin et al., 1999). This study examines social network characteristics of natural recovery on a sample of inner city injection drug users in Baltimore, MD addicted to heroin or cocaine in a HIV prevention program. Social network composition is measured at a baseline and then at a six-month follow-up period.

Also, beneficial associations are demonstrated between social support provided by networks and a range of health outcomes and control gains over one's environment (Suh et al., 1997).

Involvement with a larger proportion of non-drug users provides more avenues to reduce interactions with drug users (Latkin et al., 1999). For example, therapeutic relationships, such as bonds with counselors and other clients, positively associate with recognizing drug problems and negatively relate to rearrest (Broome, 1997). Furthermore, drug users with social service members in their social networks reduce their relationships with drug users (Fraser & Hawkins, 1984a). The presence of a social support network provides opportunities to disconnect from drug use through outlets opened by positive members. The social support network and the drug network are core aspects to consider in relation to the structural characteristics and composition of networks as is discussed in the following section.

Network structure

Social network structure and composition define the relational links among people (Shu et al., 1997). Social network size contributes to the analysis of the roles and influences within social networks. Also, an individual's network structure depends on the density, stability, intimacy, and multiplexity of the network (Thornberry et al., 2003). Social networks vary as a function of relationship characteristics. According to Latkin et al. (1995), networks influence behaviors of individuals and group norms through social comparison processes, fear of sanctioning, information exchange, and socialization. Social network analysis allows for assessments of perceived relationships. Assessment

reveals that social networks have quantifiable structural and interactional characteristics that appear to vary across populations (Fraser & Hawkins, 1984a).

Size and Composition

Key variables for studying social networks include the size and composition of the networks. Taking multiple studies into account, network sizes for drug users range from 5 people to 17 people and are composed of a variety of individuals. Latkin et al. (1999) find that the mean network size for a sample of injection drug addicts is 10.1 people with 5 people in the drug network and 6.9 people as part of the social support network. Two people are reported in the drug and support subgroups. Similarly, Latkin et al. (1995) report that the network size for a sample of injection drug addicts is 10.3 people, with family members composing 27 percent of the network and 89 percent of the addicts listing a family member in their social network. However, 47 percent of the sample reports a family member in their drug network (Latkin et al., 1995).

Additionally when looking at size and composition, Suh et al. (1997) discover an average network size of 7.5 people with 64 percent of the members in the support network and 48 percent of the members in the drug network. Sixty-four percent of the drug users have a social network with at least one user, and 65 percent of drug network members are not in the support group. Schroeder et al. (2001) yield similar results stating that 62 percent of the sample of injection drug users has at least one drug user in the social network. However, the median network size is only 5 people with 75 percent of respondents placing 2 or more people in their support network.

Network sizes vary across samples, and common attributes among social network compositions for drug addicts include prominent drug and support networks and the presence of family members within social networks. As further evidence, Hawkins and Fraser (1985) report 14.4 people in the drug users' social networks with 21 percent being relatives. While 42 percent of the network uses drugs, drug users feel that 34 percent of their network influences them not to use drugs. Hawkins and Fraser (1985) believe that the drug user's network size is smaller than a non-user's network, but Kandel and Davies (1991) state that users have larger social networks presenting a contrasting theoretical perspective. Also, finding larger network sizes for drug users, Hoffman et al. (1997) report an average network size of 16 people at the baseline interview and an average network size of 17 people three months later for a sample of injection drug users.

Density

Network density is the extent to which members in a social network connect to the other members of the social network (Thornberry et al, 2003). Density is measured as the ratio of observed ties to the maximum number of network ties. Studies on social networks suggest relatively dense relationships for drug addicts. Schroeder et al. (2001) estimate that the median density of ties is 83 percent for networks of heroin and cocaine injection users in Baltimore, MD. Also, Suh et al. (1997) find closely bound networks, estimating 71 percent of possible member ties among a sample of Baltimore drug users. Hawkins and Fraser (1987) believe that three months after treatment, network density decreases to 58.7 percent. High network density corresponds with social learning theory alleging that users form interactive relationships.

Hoffman et al. (1997) in a study of social network changes for drug users over a nine-month period find that network density increases 4 percent. However, this study produces density levels of only 29 to 33 percent. Over the course of a three-year period, Rothenberg et al. (1998) report that the number of connected network components decreases. Small subgroups of people who intensely interact decline immensely or are no longer present. This lacking interaction and lower density level best identifies with social control theory. However, the directional changes of network density levels are relatively unimportant without knowing the benefits or consequences of the increasing or decreasing connections.

Positively, Tobin et al. (2007) reveal that denser social networks reduce the chances of repeating a drug overdose. Individuals in denser networks are unable to keep drug-using ties separate from ties with conventional members allowing non-users greater influence over the addicts. Oppositely, network density and the size of drug sub-networks positively associate with the frequency of drug injection. Latkin et al. (1995) propose that as drug networks grow becoming enmeshed in the overall network, drug use increases. As a result, fewer non-drug-using associates have connections within the overall network reducing positive influences from conventional society.

Taking a different perspective, Krohn (1986) examines density at the community level. This macro-level approach predicts that as population density and urbanization increase, social network density decreases. The reasoning is that greater numbers of people increase the number of potential ties. Consequently, the lower network density leads to less constraints acting against negative behaviors. The rationale of this

perspective appears logical because urban areas with greater potential network ties are more conducive to drug use. However, most studies examining drug users focus on urban areas, but only the study by Hoffman et al. (1997) reports a lower network density level questioning the basis of the relationship between urbanization, density, and drug use. Maintaining that drug users appear to have dense networks shifts the focus to the support and drug networks in determining density's impact on the addict.

Stability

Stability is the degree to which friendships within social networks last over time (Thornberry et al., 2003). In general, larger networks correlate more negatively with stability resulting in a greater changeover of members than smaller networks (Rothenberg et al., 1998). Hoffman et al. (1997) looking at changes in networks for a nine-month period find that while aggregate network size changes very little, networks are unstable. After weighting for network size, approximately 3.1 new people enter the network, while 5.6 people leave the network over the time span. Similarly, Hawkins and Fraser (1987) state that after treatment, networks remain around the same size but contain new people. However, findings reveal that users disconnect quickly with other social support members from treatment. At the three-month follow-up interview, treatment members comprise only 22 percent of the social network (Hawkins & Fraser, 1987). As a consequence of treatment termination and the failure to form lasting attachments to conventional adults, voids are refilled by unconventional members (Fraser & Hawkins, 1984a). Overall, treatment effects on networks at a follow-up did result in more members who oppose drug use and fewer long term drug acquaintances for users and non-users.

Network stability varies upon the type of relationship. Rothenberg et al. (1998) find for a three-year period drug-using social network members have the lowest stability, while sexual partners hold the most durable relationships. Specifically, only 6.3 percent of drug users, but 40 percent of sexual partners, remain in the social networks of drug users. Lowered stability among drug users continuously provides new opportunities for drug use. Also, Latkin et al. (2004) report that the stability of active drug users as network members maintains the opportunities to use drugs. Hawkins and Fraser (1985) find street drug users to have relatively stable social networks knowing 55 percent of their network members for at least three years. This implies that social networks remain stable even when facing intervening residential treatment programs (Fraser & Hawkins, 1984a). Network stability among drug users also favors continuing drug use through patterns that have developed over time. Regardless of stability, drug network members impose negative consequences on an addict.

Examining the drug network, Costenbader et al. (2006) state the probability of decreasing one's injection risk behavior or remaining at a stable low level of injection risk increases when there is less turnover of people coming into the drug network or when there is greater turnover in drug users leaving the network. Risky networks or those with a greater ratio of drug users have lower levels of stability (Hoffman et al., 1997). Drug users leaving a network may cause the network to split, especially if the exiting drug user provides the drugs. Mixed results of the split either cause members to scramble to find new sources or to stop drug use due to the inconvenient access to drugs (Pierce, 2008). Also, turnover into the non-drug network positively affects drug users

(Costenbader et al., 2006). Differing stability levels among the subgroups present positive and negative effects on social networks.

Intimacy

Intimacy depicts how supportive the relationships are among social network members (Thornberry et al., 2003). Network members possessing greater levels of intimacy with a drug user are more likely to influence the user's behaviors. For example, intimate relationships with non-users positively correlate with a lower proportion of positive urines for a group of methadone maintenance patients (Goehl et al., 1993). Subjects with at least one drug user among their closest friends have 38% positive urines versus 36% positive urines for users without drug-using friends. Considering gender and social network intimacy, studies report contradictory findings. Kandel and Davies (1991) suggest that drug-using males have the greatest levels of intimacy, confiding, and interaction. However, Hoffman et al. (1997) describe greater intimacy levels among females and their networks. For adolescence, Giordano et al. also find more intimate relationships for females on all levels of delinquency. Regardless of gender, drug offenders do not appear isolated or lonely and report sharing intimate relationships with people in their social networks.

Married drug users have a higher level of intimacy than non-married users (Kandel & Davies, 1991). Latkin et al. (2005) report that injecting drug users married or with a partner are half as likely to inject daily. Reasoning for this decrease in drug use may be that relationships with spouses or partners supply social support, daily routine, or time away from peers. However, Goehl et al. (1993) state that the strongest predictor of

illicit drug use in methadone maintenance patients is the presence of a drug-using significant other. The roles and behaviors of a significant other or partner are highly influential when considering an addict's drug use.

Most drug networks are comprised of some family or sexual partners. These bonds typically represent more intimate relationships with drug users (Suh et al., 1997). This role of intimacy with family or sexual partners and drug use increases the difficulty of modifying social networks because behaviors extend beyond drug use to a level of personal attachment. Intimacy for these relationships is stable occurring independent of drug use as drug users like the rest of society need confidant relationships (Suh et al., 1997).

Individuals in larger drug networks have lower levels of overall intimacy and likewise less ability to regulate and control drug use (Latkin et al., 2004). This observation supports social control theory favoring loose associations and the inability to bond with society. Conversely, Kandel and Davies (1991) report more intimate relationships for users than non-users. Hawkins and Fraser (1985) concur citing that drug users see 66 percent of their network members daily and view 63 percent as close friends. For drug users, best friends are typically current or former users (Havassy et al., 1995). The findings by Kandel and Davies (1991) and Hawkins and Fraser (1985) portray social learning theory where drug users' relationships have intimacy levels expected in relationships of conventional society. Greater intimacy levels in relationships for drug addicts impact behaviors differently depending on the intimate member's drug use.

Negatively, some intimate relationships within the network happen to fulfill deviant norms, namely the needs of drug addiction (Pierce, 2008).

Multiplexity

Multiplexity is the number of different role relations any two people have with one another or the number of foci in a relationship (Thornberry et al., 2003). According to Hawkins and Fraser (1985), 50 percent of drug users' relationships are multiplex characterized by several different types of activities. Rothenberg et al. (1998) find that over a three-year period drug users' multiplexity remains constant or decreases for all types of relationships. Large social networks have lower levels of multiplexity because as the number of people increases so does the potential foci around which relationships form (Krohn, 1986). Negatively, from lower multiplexity arises greater drug use. Presenting drug network data on single focus relationships, Suh et al. (1997) report that 73 percent of the sample has a network member whose sole relationship role is to share drugs.

Additionally, if multiplex relationships exist with other drug users, these relationships potentially constrain the ability to withdraw from the drug network (Krohn, 1986). Withdrawing from the network may limit drug behavior, but withdrawal also jeopardizes behaviors in other contexts. For example, Latkin et al. (1999) find multiplex relationships where 20 percent of the members reside in the support network and the drug network. Multiplex relationships are a fairly prominent and stable network component. While many drug users have relationships with people solely for the purpose of sharing

drugs, the challenge lies in altering multiplex ties where giving up drug use leads to terminating other potentially positive behaviors.

Maintaining multiplex relationships comprised of drug users while ending drug use is possible, but Pierce (2008) recommends that users make a clean break from old network ties. Completely changing associates where no single focus or multiplex relationship has any connection to drug use helps offenders avoid drugs. While difficult, altering environments away from previous ties provides a fresh start to forming relationships operating against drug use (Pierce, 2008). Multiplex relationships offer support to individuals; however, this support may be outweighed by the conflicting focus on drug use.

Conclusion

As described in this section regarding what is known about social networks of drug addicts, findings produce few concrete results. One recurring theme is that drug users tend to maintain relationships that situate other drug users within their social networks. Beyond the presence of other drug users, social networks vary in size, structural characteristics, and member compositions. These differing components often represent the opposing theoretical perspectives of social control theory and differential association theory. Another apparent consensus within the studies suggests that social networks and members' attributes influence the behaviors of addicts on the dimensions of density, stability, intimacy, and multiplexity. The contrasting effects of the support networks and drug-using networks lead addicts to partake in conventional and non-

conventional behaviors. These inconclusive results pertaining to an addict's social network suggest that little is known about the nexus after reviewing it.

Most of the studies focus on the social networks of drug addicts as part of larger studies on HIV behaviors and risks (Costenbader et al., 2006; Hoffman et al., 1997; Latkin et al., 1995; Latkin et al., 1999; Latkin et al., 2004; Rothenberg et al., 1998; Schroeder et al., 2001; Suh et al., 1997; and Tobin et al., 2007). Other studies concentrate on addicts in treatment programs (Fraser & Hawkins, 1984a; Fraser & Hawkins, 1984b; Goehl et al., 1993; Havassy et al., 1995; Hawkins & Fraser, 1985; Hawkins & Fraser, 1987). A limited number of the studies relate to drug addicted offenders by sampling groups with high arrest rates such as Fraser & Hawkins (1984a), Fraser & Hawkins (1984b), Hawkins & Fraser (1987), and Hawkins & Fraser (1985) where 95% of the sample has a previous arrest and Latkin et al. (1999) where 76 percent of the sample has been arrested in the last ten years.

This study looks to add to the limited literature on social networks of drug addicted offenders under supervision in two different treatment programs. Drug addicted offenders are situated in a position where treatment programs can be mandated by the criminal justice system as part of their sanctioning. Examining the impact of treatment on social networks of drug offenders helps clarify the effects of treatment. Also, exploring social network influences on drug offenders offers valuable insight for treatment programs to incorporate social network dimensions.

3. PURPOSE OF THE STUDY

As is discussed in the section above, very few studies consider the social networks of drug offenders, and no studies directly pertain to known drug offenders on probation. The goal of this study is to improve the understanding of social network characteristics for drug offenders on probation. For drug offenders under supervision, the study's hypotheses describe their social networks, explore the effects of family relationships on social networks, and then examine the impact that treatment participation has on social networks.

> **Hypothesis 1a:** Drug addicted offenders with positive family relations will have larger support networks than drug addicted offenders with negative family relations.
>
> **Hypothesis 1b:** Drug addicted offenders with negative family relations will have larger negative networks than drug addicted offenders with positive family relations.
>
> **Hypothesis 2a:** Drug addicted offenders participating in treatment will have a greater increase in support network size than drug addicted offenders who did not attend treatment.
>
> **Hypothesis 2b:** Drug addicted offenders participating in treatment will have a greater decrease in negative network size than drug addicted offenders who did not attend treatment.

When considering the structure and composition of social networks, family members appear to play a dominant and influential role. This is evident in the section on

social network composition where studies find a core group of family members in the social networks (Latkin et al., 1995; Hawkins & Fraser, 1985). The position of family members in structural network dimensions also depicts the importance of this group as relationships with family members are often stable, intimate, and multiplex. Therefore, positive family relationships possess the ability to influence an abuser away from negative behaviors. These changes correspond to social learning theory in that learning occurs from those people with the greatest levels of attachment and commitment to an individual. In a positive case, family members are reinforcing definitions unfavorable to drug use and crime. Also, life course theory reveals that relationships transition away from peers in adulthood. The possibility exists for family members to fill these voids and ultimately form positive relationships with the offender impacting the negative social network. Negative family relations may have opposite effects by accepting and promoting continued drug use, unchanged behaviors, and drawing other drug users into the network.

Along the same lines, treatment participation has the ability to alter negative social networks. Treatment participation applies to social control and social learning theories. Through social control, treatment offers additional positive influences to a person's life that may represent a mode to form conventional bonds to society and lead to the removal of negative influences. Also, social learning from treatment participation reinforces conventional behaviors allowing for the expansion of social support networks. When looking at the structural components of social networks, often what needs emphasized is who comes and goes into the networks. Treatment programs oriented

toward social networks should help participants to make relationship decisions that pull positive network members into key relationship positions and remove negative members.

4. METHODS

Sample

The sample for this study consists of 80 drug addicted offenders who have at least six months of probation that starts between May 2007 and October 2007. This sample is part of a larger study, *The Effects of Manualized Treatment in a Seamless System*, under the direction of Dr. Faye Taxman. The respondents come from two Baltimore County probation and parole offices located in Towson, MD and Essex, MD. These offices supervise over 6,000 offenders, with 3,600 offenders having drug treatment conditions. The typical drug abusers for this study are involved in property and drug crimes to support substance abuse habits. Sex offenders and offenders with violent criminal histories are excluded from the study.

Offenders are approached by an interviewer upon appearing in the probation office for intake. The interviewer schedules appointments for the interested offenders who qualify for study participation. These initial appointments are typically scheduled within a week of the original contact.

After the scheduled interview determines potential inclusion in the study, the respondent is randomized into one of two groups: either a group receiving treatment under the Seamless Model (SM) or a group referred to community treatment providers, the Seamless Referral Model (SR). Randomization is based on severity of the substance

abuse disorder that affects eligibility for drug treatment. The Seamless Model implements a cognitive behavioral therapy addressing substance abuse and the criminogenic value systems of offenders. Treatment programs for the Seamless Model run for a twelve-week period and meet three times a week lasting approximately 144 total hours. This treatment duration is similar to the community programs that clients in the Seamless Referral group are to attend. Offenders placed into the Seamless Referral group are less likely to attend treatment based on findings from a historical control group which found that offenders often do not attend community treatment programs, regardless of the judicial mandate to do so. The study does not assume that the Seamless Referral group will be different than the historical control group. Also, the groups receive similar supervision services including face-to-face contacts, drug testing, collateral contacts, and so on.

Data Collection

All participants are to be interviewed at a baseline time near the beginning of their probation term and then again at three, six, and twelve-month post-randomization periods regardless of the group placement. For the purposes of this study, only data from the baseline interviews and three-month follow-up interviews are used. For those participants where the three-month follow-up data does not exist but six-month follow-up data is available, the six-month follow-up data is used (N=6). The respondents provide tracking information for the period since the last interview at the follow-up interviews. Trained research assistants who have been involved in three or more studies and who are able to build good rapport with the offender respondents conduct the interviews. Each

respondent provides written consent prior to the interview. The expected length of the interview time for administering all the surveys ranges from 90-120 minutes, and the respondents receive compensation for their time.

Survey Instruments

Addiction Severity Index (ASI): The ASI is a widely used standardized measure commonly given for initial intake evaluations, drug treatment planning, and making referral decisions (McLellan et al., 1985). The instrument assesses an individual's family and social background; employment and education; substance abuse; criminal/legal, medical, and psychiatric status; and history.

Orientation of Social Support Measure (OSS): The OSS is a generic instrument modified to examine the orientation of drug use and crime. The design incorporates aspects of social support measures along with adding the new dimension of orientation (Alemi et al., 2002). Respondents are asked the following eight questions:

1. Think through your day-to-day activities and the people you see from when you wake up until you sleep. List the initials of people you have contact with in order of how often you see them. The first person listed is the person you see most often.
2. Think of all the people that are important to you, including the people you do not see often. List, in order of importance, the initials of the people you have contact with. The first person you list is the person whose opinions and thoughts are most important to you.
3. List the initials of people who most accept you as you are. These are the people who accept both your best and worst points and who make you feel good about yourself. The person who most accepts you should be listed first.
4. List the initials of the people who are most willing to help you keep or do favors for you. The person who is most helpful should be listed first.
5. List the initials of the people you know who use drugs.
6. List the initials of the people you know who engage in criminal activity.
7. List the initials of the people you know who object to drug use by you or by others.

8. List the initials of the people you know who object to criminal activity by you or by others.

Respondents are not required to rank people on all the questions nor are they required to list a set number of people for any of the questions. All individuals named are identified as part of the respondents' social networks. By using an ordering system for some of the questions along with the respondents assessing the orientation for a particular social role, the OSS measure can quantify the relative influence of each member providing a directional measure of the member's influence (Alemi, et al. 2002). Therefore, along with identifying social network members, the OSS articulates the orientation and rank of the individual members in the respondents' social networks.

Client Evaluation of Self and Treatment- Intake Version (CESI): The CESI is a self-administered questionnaire that assesses perceptions of self and treatment at different stages of the treatment process. The CESI includes treatment motivation scales, psychological functioning scales, and social functioning scales. This study is interested in the treatment motivation scales. Treatment motivation scales measure the problem recognition, desire for help, treatment readiness, and pressures of treatment for clients. Specifically, the treatment readiness scale contains eight items assessing an offender's willingness, motivation, and treatment expectations.

Client Assessment Inventory (CAI): The CAI is a self-report instrument that measures client change during treatment across 14 cognitive and behavioral domains (Sacks et al., 2007). The CAI includes a measure of the family relationships perceived by the offender. The eight items pertaining to the family are used to assess whether the offender has positive or negative relationships with family members. Also, the CAI

contains items that ask the offender about relationships with friends that are used to form a peer relations variable.

Key Variables

The variables describing the drug offenders and their social networks include social network size, social network subgroups, family relations, peer relations, treatment group, treatment readiness, and drug use.

Social Network Size: This variable refers to the people listed by the respondent as part of the respondent's social network from the OSS. This information is obtained by counting the different sets of initials for people the offender has contact with on a daily basis and the people who are important to the offender but not necessarily seen on a daily basis. The sum represents a total network size variable.

Social Network Subgroups: For this study, social network subgroups consist of two main groups. Listed by the respondent are those people who disapprove of drug habits and crime and those people unopposed to the continuance of drug use and crime. The OSS determines subgroup composition through questions relating to a network member's orientation toward drug use and crime.

In order to calculate the negative social network subgroup, the different sets of initials are added together for the items asking the offender to list the people he or she knows who use drugs or the people he or she knows who engage in criminal behavior. The social support network subgroup is formed by adding together the different sets of initials for the items pertaining to people who object to drug use by the offender or others or people who object to criminal activity by the offender or others. The initials must also

be part of the item where the offender lists people who are willing to help him or her for placement in the support network.

Mean replacement, an acceptable technique for dealing with missing data, is used for one respondent's baseline OSS data and for two respondents' follow-up OSS data (Dodeen, 2003). Using mean replacement to form network subgroups allows the sample size to remain at 80 offenders for the study.

Treatment Group: Treatment group refers to whether the respondent is randomized into the Seamless Model (SM) or into the Seamless Referral Model (SR) after the first interview. Offenders in the Seamless Model are expected to be receiving treatment because of the role of the probation officer and the placement of treatment within the probation department. Offenders in the Seamless Referral group are not expected to be attending community treatment programs based on historical patterns from a control group of offenders within the department.

Family Relations: Family relations focus on describing the relationships between the family and the respondent. The variable considers the amount of support provided by the family members relating to the offender's drug-using behaviors. The information from eight items on the CAI with Likert scale responses forms a composite family relations variable. Individual item scores are summed and divided by eight resulting in a score ranging from 0 to 4 with 0 indicating no contact or family interactions and 4 indicating high family involvement. Items relate to the family's knowledge of the offender's problems, trust of the offender, and whether the family is willing to help the offender, etc.

From the frequency table for family relations, a variable is formed that represents positive and negative family relations. The cutoff for having positive family relations is a score of 2.63 or greater. Using the number 2.63 is decided by the median value resulting in group sizes of 36 respondents (45%) having negative family relations and 44 respondents (55%) having positive family relations.

Table 1. Family Relations Scores

Score	Frequency	Percent	Cumulative Percent
0.00	10	12.5	12.5
1.50	1	1.3	13.8
1.75	3	3.8	17.5
1.88	2	2.5	20.0
2.00	4	5.0	25.0
2.13	2	2.5	27.5
2.25	3	3.8	31.3
2.37	3	3.8	35.0
2.38	1	1.3	36.3
2.50	7	8.8	45.0
2.63	6	7.5	52.5
2.75	6	7.5	60.0
2.88	9	11.3	71.3
3.00	8	10.0	81.3
3.13	2	2.5	83.8
3.25	5	6.3	90.0
3.38	2	2.5	92.5
3.50	3	3.8	96.3
3.63	3	3.8	100.0
Total	80	100.0	

Peer Relations: Peer relations focus on describing the relationships between the offenders and their friends. This information is provided from four items on the CAI about how the offender perceives friendships to form a composite peer relations variable.

Responses for the items relate to friends' willingness to help and their understanding of the offenders' problems. The scores are summed and divided by four resulting in variable scores ranging from 0-4 derived from the Likert scale responses with 0 indicating no peer relations and 4 indicating high involvement by peers.

Treatment Readiness: Treatment readiness considers the respondent's willingness and motivations of attending treatment and whether the offender believes that treatment has a valuable purpose. This variable utilizes questions from the CESI. From the Likert scale responses to the eight items pertaining to treatment readiness, a composite variable is formed. Scores for the treatment readiness variable range from 1-5 with 1 indicating the offender sees no value in attending treatment to 5 where the offender realizes the importance and benefits that can result from treatment.

Drug Use: The drug use variable considers the use of drugs or alcohol in the time since the offender is randomized into the study. This data is self-reported from the follow-up ASI survey.

5. ANALYSIS

Sample Descriptive Statistics

Demographic characteristics, for variables such as race, age, education level, marriage, employment, and criminal and drug histories to report background information on the sample is available from the ASI. The descriptive statistics for the sample of drug addicted offenders on probation are available in Table 2 and Table 3. Also, Table 2 and Table 3 include a breakdown of the two experimental treatment groups: the Seamless Model (SM) and Seamless Referral Model (SR) for the variables. These are randomized groups and therefore expected to have fairly similar baseline measures, but tests are run to check this assumption.

The sample consists of 80 offenders on probation with drug conditions. Males compose 83.8 percent of the sample, 40 percent is African American, and 60 percent is White. The average age of the sample is 34.6 years old, and 17.5 percent of the sample is married. Of the offenders, 71.3 percent have completed high school with the mean being slightly under that at 11.63 years of education. Over the past three years, 62.5 percent of the offenders describe themselves as having steady full or part-time employment or as students.

Table 2. Descriptive Statistics of Sample

Variable	SR (n=38)	SM (n=42)	TOTAL (N=80)	t-test	p-value
% Male	84.2% (3.7)	83.3% (3.8)	83.8% (3.7)	-.105	.917
% African American	34.2% (4.8)	45.2% (5.0)	40% (4.9)	-1.00	.321
Age (yrs)	33.13 (9.6)	36.00 (11.5)	34.6 (10.6)	-1.20	.233
% Married	13.2% (3.4)	21.4% (4.2)	17.5% (4.3)	-.970	.337
% Completed High School	65.8% (4.8)	76.2% (4.3)	71.3% (3.8)	-1.020	.311
Education Length (yrs)	11.40 (1.5)	11.83 (2.1)	11.63 (1.8)	-1.046	.299
% Employed over Last 3 Years	73.7% (4.5)	52.4% (5.1)	62.5% (4.9)	1.99	**.050**
Treatment Readiness (1-5)	3.48 (.64)	3.41 (.77)	3.45 (.71)	.516	.607
Family Relations (0-4)	2.07 (1.3)	2.63 (.58)	2.37 (1.0)	-2.53	**.013**
% Positive Family Relations	47.4% (5.1)	61.9% (4.9)	55% (5.0)	-1.30	.197
Peer Relations (0-4)	2.52 (5.1)	2.32 (4.9)	2.42 (1.0)	.818	.416

Significant at p=.05

From the responses to items on the CESI, a treatment readiness variable ranging from 1-5 scores the offender's willingness and motivations of attending treatment. The average treatment readiness of the offenders is 3.45 which appears quite high, above a midpoint score of three. Family relations scores are composed from CAI responses on variables pertaining to support provided by family members relating to the offender's drug-using behaviors and treatment. The average family relations score is a 2.37 on a scale of 0-4. From the family relations score, 55 percent of the offenders classify as having positive family relations. This is determined by assigning offenders positive family relations who score above the median value on the family relations scale. The peer relations score is formed from the CAI using items about friends' willingness to help

the offender and their understanding of the offender's problem. The average peer relations score for the sample is 2.42 on a scale of 0-4. Both the family relations score and peer relations score are above the midpoint value of two for the scales.

Table 3 presents the criminal and drug use history for the sample of offenders. This sample of offenders has been arrested an average of 5.85 times since the age of 18 with an average of 2.93 arrests for drug charges. Sixty percent have been incarcerated upon a conviction, and the average incarceration time, including those not incarcerated, is 25 months. The average current probation sentence length for these offenders is just less than 2 years at 23.78 months.

Table 3. Criminal and Drug Use History of Sample

Variable	SR (n=38)	SM (n=42)	TOTAL (N=80)	t-test	p-value
Total Arrests since 18	5.00 (4.4)	6.62 (8.3)	5.85 (6.8)	-1.07	.289
Total Arrests for Drug Charges since 18	2.00 (1.7)	3.76 (4.7)	2.93 (3.7)	-2.20	**.031**
% ever Incarcerated	55.3% (5.0)	64.3% (4.9)	60% (4.9)	-.816	.417
Months Incarcerated in Life	18.89 (33.0)	30.55 (41.9)	25.0 (38.1)	-1.37	.174
Probation Length (months)	22.26 (11.6)	25.14 (17.0)	23.78 (14.6)	-.877	.383
Opiate Drug Problem	36.8% (4.9)	42.9% (5.0)	40% (4.9)	-.543	.589

Significant at p=.05

For the sample, 40 percent of the participants have their main drug problem pertaining to opiates, 26.3 percent have a problem relating to cocaine or similar drugs, 23.8 percent depend upon cannabis, and the remaining 10 percent face alcohol problems.

Opiate users are considered separately from the other drugs of choice because the addiction is physical as compared to psychological. This presents a challenge to treatment providers because an opiate addict cannot just stop drug use but needs detoxification to deal with the seriousness of withdrawal.

When comparing the SM and SR groups, t-tests for the descriptive variables find statistically significant differences for the percent employed over the last three years (p-value=.05), the total arrests for drug charges after age 18 (p-value=.031), and for the family relations score (p-value=.013). The SR group has a higher employment rate, 73.7 percent compared to 54.2 percent for the SM group, and the SR group averages 2.00 drug arrests compared to the SM group who averages 3.76 drug arrests. The SM group has a higher family relations score averaging 2.63 compared to the SR group whose average score is 2.07. The groups are considered equivalent; the few differences (i.e. employment, drug arrests, and family relations) are part of natural variation and are not connected to the instrument variables that determine drug use severity and eligibility. The differences should not affect the analyses when treatment groups and network changes are compared.

Social Network Descriptive Data

Table 4 displays descriptive statistics of the offenders' social networks at the baseline interview. This data is collected in interviews with respondents listing the initials of people whom they have contact with daily, whom they view as important, whom they know use drugs, or whom they know will help them, etc. Along with

providing sample means and standard deviations, the network characteristics of the SR and SM groups are compared, again expecting few differences due to randomization.

For the sample, the average total network size is 8.18 people. This is composed of the different people within the daily contacts (5.11) and important people (6.05) responses by the offenders. The sample finds an average of 4.68 people who accept them as they are and 3.54 people who are willing to help them. The offenders know 3.58 people who object to drug use and 3.90 people who object to crime by the offender or others. Combining people willing to help the offender and people listed as either objecting to drug use or criminal behavior, the support network size for the offenders is 2.29 people. The sample knows 3.87 people who use drugs and 2.56 people who engage in criminal behavior. Adding together the different people from these responses, a total negative network size is 5.03 people.

Table 4: Baseline Network Descriptive Data

Network Size	SR (n=38)	SM (n=42)	TOTAL (N=80)	t-test	p-value
Support Network	2.03 (1.4)	2.53 (1.4)	2.29 (1.4)	-1.59	.116
Negative Network	4.53 (4.0)	5.48 (4.0)	5.03 (4.0)	-1.08	.296
Total Network	8.79 (4.1)	7.62 (4.0)	8.18 (4.1)	1.29	.202
Daily Contacts	5.71 (3.2)	4.57 (2.7)	5.11 (2.9)	1.73	.089
Important People	6.39 (3.7)	5.74 (3.2)	6.05 (3.4)	.848	.399
Accept You	4.82 (2.7)	4.56 (2.7)	4.68 (2.7)	.418	.677
Use Drugs	3.42 (2.6)	4.28 (3.6)	3.87 (3.2)	-1.23	.224
Engage in Crime	2.26 (3.0)	2.82 (2.3)	2.56 (2.7)	-.934	.353
Willing to Help	3.45 (1.8)	3.63 (2.5)	3.54 (2.2)	-.381	.704
Object to Drugs	2.97 (2.6)	4.13 (2.9)	3.58 (2.8)	-1.88	.064
Object to Crime	3.71 (3.0)	4.07 (2.7)	3.90 (2.8)	-.566	.573

Running t-tests shows a moderately significant network difference between the randomly selected SR and SM groups for the number of people who object to drug use (p-value=.064). The SR group has an average of 2.97 people objecting to drug use, while the SM group averages 4.13 people. Also, there is a moderate difference between the groups for daily contacts (p-value=.089). The total contacts are greater for the SR group (5.71) compared to the SM group (4.57). Since the differences in the number of people who object to drug use and the number of people contacted daily are only moderately significant, they are expected to have little impact on Hypothesis 2 where treatment group and network changes are considered.

Hypothesis 1: Family relations

This hypothesis aims to describe the impact of positive and negative family relations on the social support networks and negative social networks of the offenders on probation.

> **Hypothesis 1a:** Drug addicted offenders with positive family relations will have larger support networks than drug addicted offenders with negative family relations.
>
> **Hypothesis 1b:** Drug addicted offenders with negative family relations will have larger negative networks than drug addicted offenders with positive family relations.

Hypothesis 1 requires running an F-test of bivariate relations for the family relations variable on the social network variables. Forming social network variables by frequency counts using OSS data, the drug-using subgroup counts the number of negative social network members supporting the offender's drug habit or crime. The support network tallies the number of social network members opposing the offender's drug habit

or crime and willing to help the offender. Although Hypothesis 1 focuses on support network size and negative network size, findings for other social network variables are displayed as well. Results from the analysis are shown in Table 5: Family Relations.

Table 5: Family Relations

Network Size	+ Family (n=44)	– Family (n=36)	F-test	p-value
Support Network	2.59 (1.3)	1.92 (1.5)	4.45	**.038**
Negative Network	4.98 (3.7)	5.08 (4.5)	.014	.907
Total Network	8.25 (3.5)	8.08 (4.7)	.031	.861
Important People	6.32 (2.7)	5.73 (4.2)	.585	.447
Daily Contacts	4.91 (2.5)	5.36 (3.5)	.457	.501
Accept You	5.23 (2.8)	4.02 (2.3)	4.22	**.043**
Use Drugs	3.91 (3.0)	3.83 (3.4)	.012	.912
Engage in Crime	2.77 (3.0)	2.29 (2.2)	.628	.431
Willing to Help	3.86 (2.3)	3.16 (1.9)	2.16	.146
Object to Drugs	3.89 (2.5)	3.21 (3.1)	1.15	**.**288
Object to Crime	4.55 (3.0)	3.11 (2.5)	5.35	**.023**

Significant at p=.05

Comparisons of the group with positive family relations (44 respondents) to the group with negative family relations (36 respondents) lead to three network variables having statistically significant differences. Network size differences exist for the size of the support network (p-value=.038), the number of people the offender knows who object to criminal activity (p-value=.023), and the number of people who accept the offender (p-value=.043). In all cases, the group with positive family relations has a larger network than the negative family relations group. The network variable for number of people willing to help the offender is moderately significant (p-value=.146) with the group having positive family relations acknowledging more people willing to help. No

statistically significant differences exist for the negative network or its components when comparing positive and negative family relationships.

Hypothesis 2: Treatment outcomes

Hypothesis 2 examines the impact that treatment has on offenders' social networks to find changes in social support network size and negative social network size based on the different treatment groups. Members of the SM group are assumed to be attending treatment through the probation department, as this is the larger purpose of the study. Members of the SR group who are referred into the community to find and attend treatment are not expected to either have enrolled in or be attending treatment.

> **Hypothesis 2a:** Drug addicted offenders participating in treatment will have a greater increase in support network size than drug addicted offenders who did not attend treatment.
>
> **Hypothesis 2b:** Drug addicted offenders participating in treatment will have a greater decrease in negative network size than drug addicted offenders who did not attend treatment.

Hypothesis 2 runs an F-test of bivariate relations for the experimental group variable (SM or SR) on the social network difference variables. Before the analysis, social network difference variables are formed by subtracting the social network variable values for an offender at the baseline data collection from the network data collected at the three-month follow-up interview for the same offender. Social network variables for follow-up data are formed in the same manner as baseline data using frequency counts from the OSS. Means are calculated for the social network difference variables. Although Hypothesis 2 focuses on support network size and negative network size, findings for other social network variables are displayed and discussed as well. Results

from the analysis are shown in Table 6: Social Network Differences (Follow-up – Baseline).

Table 6. Social Network Differences (Follow-up – Baseline)

Network Size	SR (n=38)	SM (n=42)	TOTAL (N=80)	t-test	p-value
Support Network	-.216 (1.7)	.069 (2.0)	-.066 (1.9)	-.683	.497
Negative Network	-1.36 (4.2)	-1.72 (4.7)	-1.44 (4.5)	.359	.721
Total Network	-.276 (4.8)	.580 (5.4)	.173 (5.1)	-.749	.456
Daily Contacts	-.330 (4.3)	.670 (2.9)	.200 (3.6)	-1.24	.219
Important People	-.611 (3.6)	.632 (4.6)	.042 (4.1)	-1.35	.181
Accept You	-.059 (2.7)	.885 (2.6)	.437 (2.7)	-1.59	.116
Use Drugs	-.881 (2.7)	-.852 (4.4)	-.867 (3.7)	-.034	.973
Engage in Crime	-1.05 (3.2)	-1.28 (2.8)	-1.17 (3.0)	.351	.726
Willing to Help	.363 (2.1)	.616 (2.8)	.496 (2.5)	-.488	.656
Object to Drugs	.513 (2.5)	.189 (3.9)	.342 (3.3)	.442	.660
Object to Crime	-.116 (4.6)	.366 (3.8)	.137 (4.2)	-.512	.610

No variables have statistically significant differences when comparing the social networks for the SM and SR treatment groups. However, certain variables produce opposing directional changes for the social network variables. Figure 1 shows the positive and negative network changes for the SM and SR groups. The sizes of the support group, total network, daily contacts, important people, people who accept the offender, and people who object to criminal behavior all have positive difference values for those in the SM group and negative difference values for the SR group.

For the SM and SR groups, the number of people the offender knows who are willing to help and the number of people who object to drug use grow positively for the social networks. For the SM and SR groups, the negative network, the drug-using

network, and the network that engages in criminal behavior reduce in size at the follow-up time period.

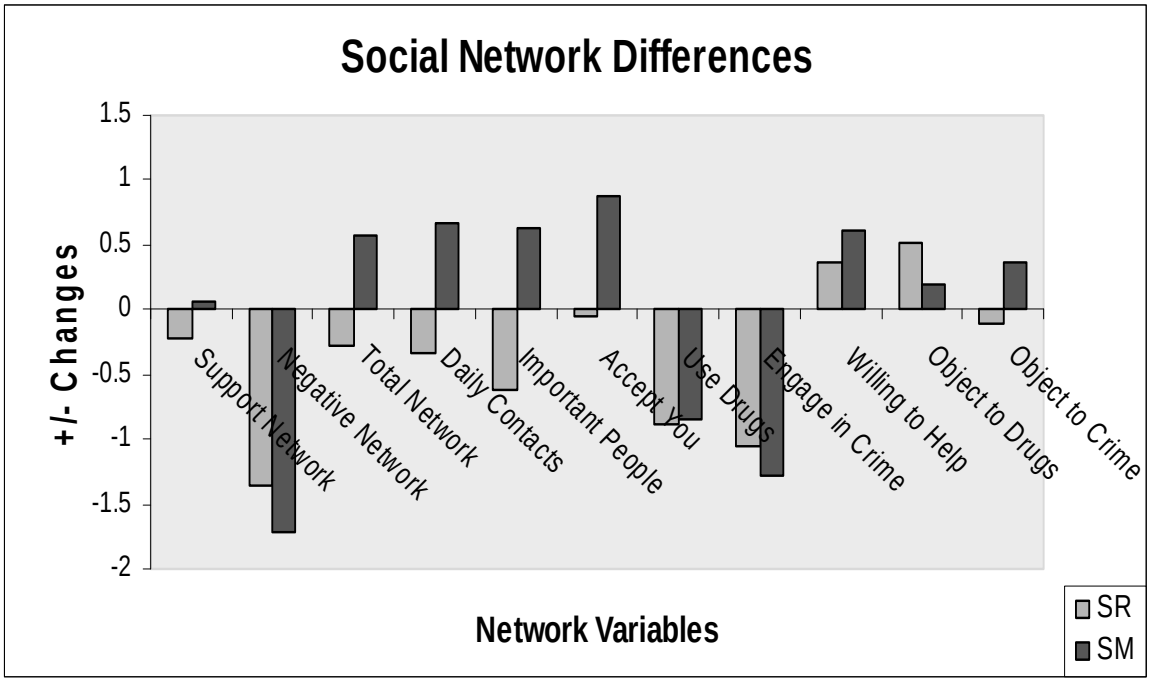

Figure 1: Social Network Differences

6. DISCUSSION

Comparing social networks of drug offenders on probation, a group never exclusively studied before, to the social networks of drug addicts in the literature review produce fairly similar findings. Specifically, family relationships within social networks demonstrate that families are important to the offenders. The strength of these relationships suggests that family members play meaningful roles within the social networks. Likewise, the implemented treatment program addressing the social networks of drug offenders appears to have an impact. Social networks of offenders on probation who are attending treatment slightly change over the three-month period, more so than offenders not going to treatment, revealing the need to consider those people surrounding the offenders.

Baseline Network Descriptive Statistics

Size and Composition

Examining drug use as more than an individual characteristic and influenced by other people allows for the exploration of offenders' social networks. Considering total network size (mean=8.18) as a basis for the discussion, other network variables lead to some interesting findings about social networks. For the offenders in this study, total network size is within the network range of 5-17 people from the reviewed studies relating to social networks of HIV addicts and addicts in treatment (Latkin et al., 1995;

Latkin et al., 1999; Suh et al., 2007; Schroeder et al., 2001; Goehl et al., 1993; Havassy et al., 1995; Hawkins & Fraser, 1985). Also, like the other studies, the offenders have both prominent negative networks with 5.03 people and support networks with 2.29 people (Latkin et al., 1999; Suh et al., 2007).

Knowing that total network size consists of the people the offender has contact with daily (mean=5.11) and the people who are important to the offender (mean=6.05) indicates that over half the offenders have contact with people on a daily basis who are important to him or her. Also, the offenders think outside their daily lifestyle and recognize about 3 additional people who are of importance to them. Drawing these important people outside the offenders' daily lives into the network is another potential means of building the support network.

Slightly less than half of the people the offenders name use drugs (mean=3.87), but the offenders have smaller crime networks with less than one-third of network members engaging in criminal activity. These measures combine to form the negative network of the offenders averaging 5.03 people. Therefore, about 1.5 people are in the offenders' drug-using networks and criminal activity networks. The negative network composes over 60 percent of the total network. This means that sixty percent of the people the offenders interact with either use drugs, engage in criminal behavior, or both suggesting that reinforcement for these behaviors is widespread within the social networks. With such large negative networks, the offenders can easily continue drug-using behaviors.

Of network members, 43 percent are willing to help the offender (mean=3.54), around the same number object to drug use (mean=3.58), and almost 50 percent object to criminal behavior (mean=3.90). The combination of these networks leads to an average support network size of 2.29 people making up less than 30 percent of the total network. Offenders recognize more people who object to drug use and criminal behavior, yet these people are not necessarily willing to help them. Conversely, all of the people the offenders recognize as willing to help them do not necessarily oppose drug use or crime. Comparing the network sizes, the negative network is twice as large as the support network.

Offenders' networks contain about the same number of drug users as people who object to drug use. However, when looking at network size for criminal behavior, offenders list 1.34 less people who engage in criminal behavior compared to those people objecting to criminal behavior and a slightly greater number of people who oppose criminal behavior than drug use. Thus, it appears from the differences in network sizes and the large number of people who oppose criminal behavior that drug use may be a more normalized behavior for the offenders compared to criminal acts. Social learning theory, which implies that acceptable behaviors develop within the social network through positive reinforcement and imitation, may influence and promote drug use (Sutherland & Cressey, 1978). Also, the drug-using behaviors of the people surrounding the offenders often make it socially easier for the offenders' own behaviors to occur. Crime appears less acceptable as social network members offer less exposure and may

provide negative reinforcement. Negative influences are more visible in accepting drug use within the network as it occurs more frequently than criminal activity.

Over half of the people the offender includes in the network accept the offender as he or she is (mean=4.68). Network members offering support, as well as negative network members, compose this group. What could be of importance here is not who accepts the offender, but who does not accept the offender and wants a change in drug-using behaviors. People who accept the offender and also accept his or her drug use negatively influence the offender. However, people who do not accept the offender because of his or her drug use, but are still located within the network for opposing drug use or crime, willing to help the offender, or as important to the offender could provide support for the offender to stop drug use.

Density

Network density is the extent to which social network members connect to other social network members. Also, high social network density relates to users forming interactive relationships, a concept of social learning theory (Fraser & Hawkins, 1984a). Results from this study show that offenders have 6.05 people important to them, 4.68 people who accept them, and high family and peer relation scores. Thus, the offenders do interact with their social networks supporting some degree of network density.

Stability

Network stability considers the stability of network members or the stability of the size of network groups. In this study, network group sizes remain fairly stable. Total network size increases by .173 people and support network size barely decreases by .066

people. The biggest difference is a decrease in negative network size by 1.44 people. This study, while only over a three-month period, is consistent with results from Hoffman et al. (1997) that finds over a nine-month period aggregate network sizes change minimally.

The high network stability from the baseline to follow-up interviews may help explain drug use. While there is a decrease in negative network size, the decrease is not enough to interfere with continuing drug use or exposure to drug use. No evidence exists of replacing the people leaving the negative network with new members in the support network. According to Costenbader et al. (2006), there is a low probability that drug users change drug behaviors without altering their negative networks. Stable relationships develop patterns of behavior that are hard to change (Krohn, 1986). Therefore, offenders who ceased their drug behavior but still associate with drug users for other reasons revert back to drug use more easily because of its past placement in these relationships.

Intimacy

Greater intimacy levels with both positive and negative network members are likely to influence behaviors (Goehl et al., 1993). Offenders see 62.5 percent of their network on a daily basis and 74 percent are important to them. These findings are similar to Hawkins & Fraser (1985) where 66 percent of members are seen daily and 63 percent are close friends. Offenders in the study appear to have intimate relationships with other drug users, as drug network size changes only slightly even with treatment occurring.

These higher levels of intimacy lead to the lack of change in negative network size and allow for continuing drug use.

The similarity of family and peer relationship scores at the baseline and follow-up measures, as well as the high scores implies intimate relationships. Offenders value their relationships with family and friends and believe they understand their problems and treatment options. However, unknown to the study is whether the intimate relationships occur in a supportive and positive manner or in a negative manner. Supportive relationships may be overshadowed by intimacy promoting continued drug use.

Multiplexity

For the offenders in this study, multiplexity within the networks appears with the placement of network members in the negative network, as well as in a network accepting the offender, where about 1.5 people overlap networks. The overlap between the negative network and people willing to help the offender is about half a person. Viewing accepting the offender and willing to help the offender as relatively positive networks, similarities arise with Latkin et al.'s (1999) finding where 20 percent of members locate themselves in positive and negative networks. Relationships form conventional and non-conventional bonds with society, and by social control theory these bonds help determine the behaviors of the offenders. Individual relationships offer behaviors that support and oppose drug use by the offender placing the member in multiple networks. The coexistence of people in a support and drug network constrains the ability of offenders to remove people from their drug network as the members may be offering a supportive service the offenders cannot afford to lose.

Family Relations

The presence of family members within social networks is a common finding (Latkin et al., 1995, Hawkins & Fraser, 1985). Of the offenders in the study, 87.5 percent have at least one family member with whom they have a relationship. However, while family members are generally thought of in a supportive manner as is illustrated by the high family relations score, offenders also place family members in their negative networks.

Learning depends on the people with the greatest influence in an offender's life. Offenders have fairly strong relationships with both family members and peers alluding that relationships are reciprocated, longer in duration, and more cohesive (Fraser & Hawkins, 1984a). The family and peer relations scores are above the midpoint value of two with the family relations score being a 2.37 and the peer relations score being a 2.42. A balance between family and friends is visible in social networks supporting life-course theory that as offenders reach adulthood their social networks are not peer dominated. Specifically, Hypothesis 1a explores the impact of family relations and whether they can have a positive impact on offenders.

Evidence supports Hypothesis 1a that offenders with positive family relations have larger social support networks than offenders with negative family relations. Statistically significant differences at a significance level of .05 exist for the size of network support groups between positive and negative family relations (p-value=.038). Additional evidence is a statistically significant difference in the number of people the offenders list as objecting to criminal behavior (p-value=.023), and the number of people

willing to help the offenders is moderately significant (p-value=.146). Offenders with positive family relations have more network members opposing criminal behavior and have more network members willing to help. The last component of the support network, people the offender knows who object to drugs, shows no differences (p-value=.288).

Conversely, Hypothesis 1b, that drug addicted offenders with negative family relations will have larger negative networks than offenders with positive family relations, lacks support. Findings show no differences in the positive and negative family relations groups for the negative network size. While negative network size is slightly higher for the negative family relations group, the components of knowing people who use drugs or knowing people who engage in criminal activities have larger network sizes for positive family relations. As a result, offenders with positive family relations have a greater overlap of people in their drug and crime networks.

The lack of difference between the negative social network size and positive or negative family relations may have a theoretical basis involving differential association theory. Differential association theory states that relationships are longer, cohesive, intimate, dense, and characterized by role modeling (Fraser & Hawkins, 1984a). So even though offenders' relationships with family members are composed of positive traits similar to relationships in conventional society, the family members could still be part of the negative network. Also, differential association theory suggests that network composition includes mainly drug users (Fraser & Hawkins, 1984a). Therefore, if the family members are not located in the negative network, offenders with positive family

relationships may choose to have separate negative networks similar in size to offenders with negative family relationships.

The similarity in negative network size between the groups and if offenders with positive family relationships place family members in the support network allow for the difference to occur between positive and negative family relations for the support network. These network compositions correspond with Hypothesis 1a where offenders with positive family relations have a greater support network size than offenders with negative family relations. The support network differences related to positive family members do not affect negative network sizes.

Another network variable not contained in either hypothesis but statistically significant when considering family relations is the number of people the offenders list as accepting them as they are (p-value=.043). Offenders with positive family relations feel a greater acceptance among network members.

Treatment Participation

Studies show that gaining positive network members reduces and helps prevent drug-using behavior (Latkin et al., 2004; Costenbader et al., 2006). Although relationships with family members and peers are positive, offenders know more people who use drugs (3.87) than object to drug use (3.58) at the baseline. In the follow-up data, offenders know only 2.96 people who use drugs and 3.91 people who object to drug use. Specifically, the Seamless Model (SM) group of offenders knows a slightly greater number who oppose drug use, 4.29 people, as compared to the Seamless Referral (SR) group who knows 3.48 people. The SM group also knows a greater number of people

who oppose criminal behavior. This implies that for the SM treatment group during the recovery process a greater effort is made to associate with positive network members critical of the offenders' past behaviors.

Hypothesis 2a, that offenders participating in treatment have a greater increase in support group size than offenders not participating in treatment is displayed in Table 6: Differences in Social Networks. Although not statistically significant, the SM support network size increases at the follow-up period (.069) compared to the SR group where the support network is smaller at the follow-up period (-.216). The social network variable for whom the offenders know that object to criminal behavior, a component of the support network, results in opposing signs for the SM and SR groups supporting Hypothesis 2a.

The number of people willing to help the offender is positive for both groups; however, the number for the SM group (.616) is larger than that for the SR group (.363). Also, the number of people who object to drugs by the offender increases for both groups, yet the SR group (.513) yields a greater increase than the SM group (.189).

Offenders in the SM group are in contact with a greater number of potential positive influences than members of the SR group. The SM group attends treatment three times a week which includes seeing their treatment counselor and probation officer. Also, other offenders within the sessions could offer support to the offenders. This exposure to additional support network members offered by treatment may account for the positive difference in support network size for SM group members.

If this is the case, according to Hawkins & Fraser (1987), these relationships are not expected to last more than three months. SM treatment duration is about three months in length, suggesting that once treatment ends the offenders' new relationships dissolve shortly thereafter. With the completion of treatments and meetings with probation officers occurring less often, offenders are no longer required to have a high degree of contact with these individuals. Without constraints on the offenders to interact with these newer positive members, offenders have more freedom to return to their previous relationships. However, the offender's ability to maintain these newly formed relationships created through treatment programs should reduce drug use for a longer period of time.

Fraser and Hawkins (1984a) find that drug users with social service members in their social networks reduce their relationships with other drug users. In this study, the offenders participating in treatment and interacting with counselors increase positive network members. However, no differences are shown in the number of drug users or people engaging in criminal behavior between the groups.

One indication of drug use in adulthood is the presence of drug use within social networks (Schroeder et al., 2001, Brewer et al., 1998). At the baseline measure, 88.7 percent of the offenders have at least one drug user in their social networks with the average number being 3.87 drug users. However, after a group of the offenders attend treatment, the follow-up data shows few changes. For the SM group, 50 percent admit to using drugs between the baseline and follow-up interview, and 83 percent have at least one drug user in their social network at the follow-up. Interestingly, for the SR group

only 37 percent admit to using drugs between the baseline and follow-up interview, and 71 percent have at least one drug user in their social network at the follow-up. The continuance of drug users within social networks allows for maintaining drug use by the offenders.

Hypothesis 2b, that offenders participating in treatment will have a greater decrease in negative network size than offenders not participating in treatment is unsupported in this study. Positively, both groups have negative networks decreasing by over a person at the follow-up interview. However, negative network size for the SM group is 3.66 people, actually higher than the SR group of 3.16 people. The social network variables for the number of people who use drugs and the number of people who engage in criminal behavior shows the SM and SR groups having similar decreases. Both groups reduce the number of people in their networks who use drugs by over three-fourths a person and reduce the number of people who engage in criminal activity by over a person. This lack of difference in network sizes is contradictory to what Hypothesis 2b predicts.

While the SM group shows growth in support group members, these relationships may not form strong enough bonds to alter the offender's negative relationships. Although the bonds to the treatment counselor, probation officer, or other treatment members are supportive, levels of commitment and attachment to those individuals may not have enough power to override behaviors from the unconventional bonds with drug users. At a three month follow-up, these relationships may be a starting point for the offenders in realizing that they can form new relationships outside of drug users and still

find people who accept them. If the relationships can continue to build and develop, drug use and negative network size should decrease with differences arising between the SM and SR groups.

At this point, even as more supportive members are recognized, offenders continue to hold strong relationships with negative network members, and drug use remains an acceptable behavior. Three months is a short time period to expect changes to occur within an offender's lifestyle. These offenders have patterns of drug use that last for many years, and friendships that span the same time period (Sampson & Laub, 1993). Dropping friendships in three months that have persisted over the years yield high expectations. The persisting friendships with drug users are likely stable, intimate, or multiplex, making it challenging for the offender to stop associating with a network member. The drug user is likely to be intertwined into different parts of the offender's life. Therefore, removing this drug user in three months is not possible until other roles the drug user plays within the offender's life are filled.

However, both groups did show a decrease in negative network size of about 1.5 people. This decrease could be a break from weaker relationships with negative network members. Possibly probation, independent of treatment, may influence an offender to cut ties with negative network members focusing on drug use with whom the offender holds only loose associations. As a condition of probation, the offenders are required to take urine tests on a regular basis that may influence them to remove these single focus relationships. Considering treatment over a longer period of time is necessary to see if

treatment decreases negative network size weakening bonds with enduring drug-using friends.

For the SM group, the social networks show a growing level of support and a decreasing negative network. Treatment increases offenders' support networks compared to the SR offenders, but treatment shows no effects on changing the SM group's negative network differently from the SR group. An additional factor outside of treatment may influence the negative network changes.

Policy Implications

Policy implications from this study include efforts within the probation department by probation officers to inquire about family members with the offenders, increasing the number of treatment programs that focus on social networks, and the benefits from legislation financially supporting these treatment programs.

Within the probation departments, policy requirements may include probation officers asking about family members during discussions with the offenders and trying to incorporate the offenders' family members into meetings (Family Justice, Inc., 2006). Inviting family members to probation meetings could strengthen the relationships between the offender and family members. Family members can be reinforced by the probation officer if the offender is doing well or learn how to further help the offender. Also, discussing family relationships with offenders may allow the probation officer to gauge if the offenders can receive support from the family and help the offenders draw positive family relationships into their networks.

The treatment program designed for the probation departments in this study specifically targets social networks and relationships. With results from this study and previous studies supporting the idea that treatment is increasing support networks for the offenders, policy to enact more similar programs may result in a greater reduction in drug use (Copello et al., 2002; Copello et al., 2005; Velleman et al., 2005). Treatment providers need to make a conscious effort to increase treatment programs that work with offenders and their social networks.

On a larger level, legislation providing more money to social network oriented treatment programs may have a wide range of benefits (Family Justice, Inc., 2007). Social network alterations may lead offenders to lower drug use rates and a smoother transition from the criminal justice system to the community as stronger networks build around the offenders. Other potential benefits to society are reductions in crime rates, reductions in incarceration rates, and increased public safety with these treatment programs emerging as more cost effective (NIDA, 2006).

Future studies

The next step to build on this study is having actual treatment attendance data. The members of the SM group are assumed to be attending treatment because of the direct relationship between treatment and the probation office, while members of the SR group are assumed not to be attending treatment as relationships between community treatment providers and probation officers are less direct. Past evidence suggests that few offenders attend community offered treatment programs even with attendance as a requirement of probation unless the offenders feel that consequences will be enforced

(Miller & Flaherty, 2000). However, there are bound to be people in the SM group not attending treatment and people in the SR group who take an initiative and find an outside treatment program. Knowing not only who is attending treatment but the person's length and degree of participation can yield a better understanding if treatment is having desirable effects on social networks.

Also, tracking the offenders over a longer period of time will see if treatment has any lasting effects on the offenders (McKay et al., 2005). Data for this study is to be collected at three, six, and twelve-month follow-ups. Rerunning treatment analyses and comparing social networks at six and twelve-month follow-ups would show how beneficial treatment is to the offenders with regards to network composition in the long run. Also, drug-using habits and social network composition at six and twelve-month follow-ups for the SM group can be compared to the baseline, three-month results, and six-month results for the twelve-month data. It would be interesting to see if any changes occur to negative networks or if support networks continue to grow as is illustrated at the three-month follow-up or if networks revert back to a baseline level.

This study just touches on describing the social networks of drug offenders on probation. There are countless studies to conduct to learn about relationships leading a person to use drugs or supporting a person to stop drug use. Also, studies focusing on treatment and social network alteration provide insight on changing drug use behaviors.

Limitations

A major limitation to the study is the sample size. Having a sample of only 80 offenders makes finding statistically significant results difficult. Once the sample size for

the study grows, rerunning analyses may provide stronger results. However, this is an exploratory study in nature.

Also, very large standard errors are found in the results. Many of the network variables have a large range of values as the offenders have very small and very large networks. This becomes more of a problem in looking at the difference variables where large increases and large decreases are possible, creating an even greater spread of the data. With a larger sample size, standard errors should deflate in size.

Another limitation to the study is missing data. Mean replacement is used on one subject to fill in missing responses to baseline OSS data and two subjects at the follow-up interviews for missing OSS data. When using mean replacement during the follow-up period for network size, the SM and SR treatment group network values are inserted depending on the subject's condition and not the total mean network values. Using mean replacement allows the sample size to remain at 80 cases as opposed to dropping even lower to 77.

7. CONCLUSION

Social networks in this study resemble those previously conducted on drug offenders. Prevalent drug networks are a main part of the overall social network with smaller support networks. Offenders' social networks vary in size ranging from 0-21 people, and the roles of the people fulfill a range of behaviors such as the negative network, support network, opposing drug use, being important to the offender, etc. Network members impact the density, stability, intimacy, and multiplexity of the social networks. Considering these characteristics and social network composition helps to explain the stopping or continuance of drug use by the offender.

The role of family within social networks impacts drug offenders' support network sizes. Those offenders with positive relations also have a greater support network. However, positive or negative family relations have little effect on the negative networks of offenders resulting in similar sizes.

The goal of treatment is to stop the offenders' drug use, and one way of doing this is by building a stronger support network for the offenders and reducing the size of the negative network. Providing treatment for offenders does increase the support network over a three-month period in comparison with offenders not attending treatment. However, negative network sizes between the SM and SR groups report no differences. At times, the data shows drug-using behaviors and the negative network groups are worse

for the SM offenders. This result is contrary to the purpose of treatment designed to help offenders take steps to ceasing drug use.

Future treatment programs need to incorporate a way to reduce the size of negative networks of drug offenders. Both hypotheses demonstrate greater support networks for offenders either through strong family relations or treatment. However, no changes occur to the negative networks. A new focus on minimizing negative networks is a possible key to removing drug-using influences from an offender's network to end drug use.

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