

INFLUENCE OF SOCIAL FACTORS ON MOTHERS IN TREATMENT FOR
SUBSTANCE USE DISORDERS

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NATHAN V. HILTON

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APPROVED: _____
Thomas J. Morgan, Psy.D.

Patrick R. Clifford, Ph.D.

DEAN: _____
Stanley B. Messer, Ph.D.

ABSTRACT

Consideration of women-specific issues in addictions treatment requires attention be given to the subset of women who are also mothers. For these women, the repercussions of substance use are often profound and far-reaching. Impaired decisions and parenting skills may increase risk for child abuse and neglect. This dissertation sought to better understand how the quality of a mother's social resources and her substance use behaviors are influenced by her primary drug of choice (heroin, cocaine/crack, marijuana, alcohol). Social network characteristics and substance use behaviors were characterized at treatment entry, treatment discharge, and six months post-treatment in a sample of 246 women, with minor children, who received addictions treatment based on involvement with the New Jersey Division of Youth and Family Services. Nearly half of these women had not achieved the equivalent of a high school degree and the majority was unemployed and unmarried. At treatment entry, primary heroin users reported more frequent primary drug use, more poly-drug use, and less abstinence in the past thirty days than women with other drug preferences. However, heroin using mothers improved most during treatment, reporting similar frequencies of substance use and use-related problems at both follow-up assessments as women with other drug preferences. At treatment entry, all participants reported extensive contact with family dense social networks that supported general well-being, abstinence and treatment seeking. Primary marijuana users, however, reported networks that were more neutral towards their continued substance use than women with other drug preferences. Over time, marijuana using women reported an increase in the frequency of substance use by their network members whereas women with heroin and cocaine preferences reported decreases. Importantly, frequency of

substance use by network members was the social network characteristic most highly correlated with concurrent and subsequent substance use and use-related problems. The reason for these marijuana-specific social network differences is not immediately clear, but may reflect a broad societal belief that marijuana is less physiologically, psychologically, and socially harmful than other drugs. Nonetheless, these results suggest that treatment may not adequately address the importance of social factors in the maintenance of marijuana use disorders.

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CHAPTER I

INTRODUCTION

Complex social relationships are one of the hallmarks of human existence. Throughout our history we have formed groups in order to survive. What is deadly to the individual has been conquered by the tribe, clan, or family. Problems such as accumulation and use of resources, protection from predatory and climactic threats, and the raising of new generations have all been addressed through primarily social means. Indeed, it could be argued that one of our strongest evolutionary advantages has been the capacity to form and maintain social bonds. In a sense then, we are “hard wired” to enter into relationships; it is our evolutionary heritage.

It is therefore not surprising that our overall quality of life is dependent upon, or at least greatly affected by, the nature of our relationships. There is an impressive amount of literature indicating the benefits of feeling, “...cared for and loved, esteemed, and a member of a network of mutual obligations”(Cobb, 1976). In fact, the courses of both physical and psychological maladies (e.g., arthritis, tuberculosis and depression) are ameliorated by the presence of social support (for review, see Cobb, 1976). More generally, both mortality rates, regardless of the cause, and measures of mental health

functioning have been found to be poorer in people who report comparatively less social support (for review, see Cohen & Wills, 1985). These empirical findings underscore a more intuitive knowledge regarding the vital nature of relationships in everyday life. Succinctly stated, the more one is involved in a range of healthy relationships, the more likely one is to feel well-adjusted and happy.

One perspective of social support posits that these relationships serve as protective buffers against the inevitable vicissitudes of life. In a study of 654 early to late adolescents, social support provided significant relief in seven common problem areas, including psychosomatic complaints, emotional distress, and problems with drugs, relationships, work, health, and family (Newcomb & Bentler, 1988). In a study composed of men, those with insufficient social support were more likely to report depression (Booth, Russel, Soucek & Laughlin., 1992). Social support has been found to moderate the relationship between work stress and psychosomatic complaints, depression, irritation/strain, and social anxiety such that the more social support experienced by the individual, the weaker the relationship between stress and negative symptoms (Frese, 1999). In a study of 628 people with substance use disorders that entered an addiction treatment program, subjects who reported stronger support from family members and friends reported greater overall social functioning three and eight years post-treatment (Moos & Moos, 1984). The benefits of social support can be experienced by individuals, both directly and indirectly, in the context of a variety of acute and long-term stressors and problems. Moreover, this perspective of social support suggests that people with inadequate or unsupportive social systems may be more vulnerable to the life stressors that everyone faces, and, as a result, be less resilient to negative situations.

Alternatively, social support may act in a more global way by improving quality of life regardless of the presence of specific or acute stressors (Cohen & Wills, 1985). People with larger social networks enjoy the benefits of sustained social roles and the rewards that commonly accompany them (e.g., Levinger & Huesmann, 1980; Moos & Mitchell, 1982; Reis, 1984; Wills, 1985); they are more integrated in their social surroundings and therefore reap more of the benefits of "...the existence or availability of people on whom we can rely, people who let us know that they care about, value and love us" (Newcomb & Bentler, 1988). Thus, whereas individuals may benefit from supportive social environments during difficult or stressful periods, their overall quality of life may be generally and globally improved merely by the knowledge that positive support is available when they need it.

Nonetheless, while there is ample empirical and intuitive evidence for the positive effects of social support on quality of life, there is a wide range in people's desire and capacity to be related to each other. Not only are relationships nearly ubiquitous over time and geography, they are also amazingly diverse and complex. Individual definitions of a "healthy" or supportive relationship, and the outcomes sought by building and maintaining these relationships, vary considerably. A romantic relationship with a partner of twenty years is experienced in a very different way than a relationship with a colleague at work. A relationship with a parent is felt in a different way than a relationship with a friend. The benefits of having these different relationships, and the type of support achieved by them, are not homogeneous. An individual may seek support for work-related conflicts from friends, support for their "quality as a person" from their spouse and acknowledgement of their skill set from co-workers. Each relationship is likely to

guide and affect an individual's behavior in a very different way. Moreover, the importance and salience of any single relationship is contingent on the people and social factors at play in an individual's life.

Social support, therefore, can be viewed as a construct that is larger than an individual relationship. It is the culmination of a culture, a community and the primary relationships that shape and fortify a person's experience and sense of life. Typically, social support is a medley of influences, some which are generally viewed as beneficial, some that waiver in the consistency of their supportive message, and some that actually serve to exacerbate life's difficulties rather than to soothe them.

Gender may be an important consideration when assessing the influence of social support on general psychological and physical well-being, as well as on drinking and drug using choices. The widely held perception of women as more social beings than men appears to be supported by considerable evidence. For example, an article by Kendler, Myers, & Prescott (2005) identified substantial gender differences in the value that men and women place on their social contact and network support. These authors write that, "In dealing with adversity, women are more likely to seek emotional support in their social network than are men. Men may turn to their network, but interactions are likely to be focused on shared activities or 'distractions'." Thus, the value and nature of social support may differ across the genders, identifying gender as a key component in understanding how social factors affect the individual's behavior. This study focuses on how social factors influence the decisions women make regarding alcohol and other drug use. Differences in the social networks and substance use profiles in women who report

alcohol, heroin, marijuana, or cocaine/crack as their primary drug of choice will be explored.

Factors That Influence Substance Use, Treatment Seeking, And Treatment Outcome

Social Influences

Nowhere is the complicated nature of social influence more evident than in alcohol and drug use disorders. Although there may be an important genetic component in the genesis of such problems (Kendler, Prescott, Neale, & Pedersen, 1997), social factors also play an undeniable role. In fact, it is likely that genetic and environmental factors interact to influence susceptibility to substance use disorders (McGue, 1999). While the specific genes underlying risk for addiction are poorly understood, Ohannessian and Hesselbrock (1999) found that among 153 individuals, only those with a positive family history for alcoholism demonstrated a susceptibility to drug and alcohol diagnoses when low social support was perceived. This finding suggests a complex interplay of heritability and environment.

From a macro perspective, cultural differences in alcohol availability have been reported to have a large effect on alcohol consumption and the frequency of problems related to alcohol use (Blane, 1990). Cultural assumptions powerfully affect the individuals' beliefs about normative drinking as well as drinking expectancies (for review, see Pihl, 1999). Studies assessing national drinking trends across the globe identify some cultures (e.g., Ireland, England) as significantly more permissible of heavy drinking (defined as 4 or more drinks in a single drinking episode) in women than others

(e.g., Romania, Germany) (Dantzer, Wardle, Fuller, Pampalone, & Steptoe, 2006). Even in cultures that at first glance might share commonalities regarding alcohol use, important differences arise after more careful consideration. For example, although Australia and the United States have similar rates of alcohol dependence diagnoses (6.8% and 6.5% respectively), there is a staggering difference in the twelve-month prevalence for alcohol use (77.2% and 46.3% respectively) (Teesson, Baillie, Lynskey, Manor, & Degenhardt, 2006). While there may be several explanations for this latter observation, it is possible that cultural differences in expectations regarding normal and problematic alcohol use are at play. Australian culture, for example, may have a more permissive culture for general and social drinking than the US culture, leading more individuals to report lifetime consumption, yet may be similar to the US in their definition and diagnosis of alcohol dependence. Thus, the more permissive societal attitude towards drinking does not translate into an increased risk for a dependence diagnosis. Although additional research is needed to elucidate such culturally-mediated influences, it is clear that social influences on drinking and drug use are not confined to relationships between individuals; more distal societal, religious, and cultural forces and constructs must also be considered in order to gain a full understanding of how social factors influence alcohol use behaviors.

Peer group memberships are also powerful influences in the development of substance use disorders. Membership in a fraternity predicts increased alcohol consumption (Martin & Hoffman, 1993). Similarly, if one has friends that use illicit drugs, one is more likely to do so as well (Pihl, 1999). Adolescents are at particular risk for the influence of a deviant peer network (Duncan, Duncan, Biglan, & Ary, 1998), and

these young adult years are often decisive in setting long-term drinking and drug using habits. One need only look at the research on college student drinking and college student perceptions of normative behaviors to understand the power that friends and peers have on drinking and drug use (for review, see Perkins, 2002).

In addition to the potentially significant influences of friends on shaping substance use behaviors, an individual's family dynamic critically factors into decisions regarding drinking and drug taking. A positive family history of alcoholism has long been identified as major risk factor for the development of an addiction (Pihl, 1990). Likewise, an increased risk for drug use has been demonstrated to occur in families in which parents use drugs (Johnson, Shontz, & Locke, 1984). Although genetics again is likely a contributor, research supports a strong environmental component to familial transmission (McGue, 1994). Social learning theory can help explain the apparent transmission of drinking and drug using behaviors, including patterns of use, triggers for use, and consequences of use (Patock-Peckham, Cheong, Balhorn, & Nagoshi, 2001). One might learn, for example, to deal with negative affect and aversive situations through drug and alcohol abuse as one's addicted parent does. Thus, an individual's family of origin affects risk for substance use disorder development through both genetic factors as well as through social influences inherent in the family structure.

Familial influences go even further, with problematic alcohol and drug use by one member often influencing the overall social dynamic and health of the entire family. Correlations between increased alcohol use and social stressors, such as high conflict and poor communication, have been found in families (Moos & Moos, 1984). In a study of over 11,000 women, those who were married or living with a partner with alcohol

problems were at elevated risk for experiencing anxiety and mood disorders, victimization, injury and poorer health than their counterparts who did not live with a partner with alcohol problems (Dawson, Grant, Chou, & Stinson, 2007). Poor child-parent relationships factor strongly into an adolescent's development of substance use behaviors (Pihl, 1999). Other relevant social stressors include relationship difficulties between parents (Wolin, Bennett, Noonan, & Teitelbaum, 1980) and physical abuse and neglect of children by parents (Widom, Ireland, & Glynn, 1995). Thus, substance abuse and dependence disrupts the entire family structure, creating more instability and insecurity for all members, most importantly the children. Astoundingly, the "1989 National Committee for Prevention of Child Abuse estimated that 9 million to 10 million children were affected by substance abusing parents and that 675,000 were maltreated each year by an alcoholic or drug addicted caretaker." (Tracy, 1994). It is important to note however, that these findings are correlative and not causative; it is possible that social stressors are as much caused by alcohol and drug problems as vice versa.

Taken together, this research strongly suggests a central role for social influences on the development and/or maintenance of substance use problems. However, the data also indicate that social support is the sum of multiple, complex, and interacting interpersonal relationships, each with their own valence, significance and impacts on substance use. While much work has been done to elucidate relevant social forces in the formation of substance use disorders, the exact nature of how relationships factor into an individual's decision to use, particularly into a woman's decision to use, as well as stop using, remains an important question to be researched.

An individual's social network exerts complex influences on general well being as well alcohol-specific outcomes. General social support (i.e., not directly related to substance using) for a person in recovery appears to exert a positive, albeit limited, influence on treatment outcome. These general positive social support features may act to buffer against factors that might otherwise lead to a resumption of drinking. For example, while stressful events predicted greater alcohol consumption among 39 people recovering from a substance use disorder, this relationship was moderated by social support (Ames & Roitzsch, 2000). In a study of 100 residential drug abusers, positive social support, in the form of family involvement in treatment and the development of a supportive social system, was predictive of increased treatment retention (Siddall & Conway, 1988). Decreased family conflict during treatment (a measure of perceived overall quality of relationships/general support) was related to less drug use, less injected drug use and decreased criminal behavior among heroin abusers (Knight & Simpson, 1996). Furthermore, in a study of 100 residential patients being treated for alcohol dependence, general social support at the end of treatment was related to drinking outcome twelve to thirty months after discharge (Noone, Dua, & Markham, 1999). Thus, general support from a variety of sources and at different times in the course of recovery can bolster positive treatment outcomes.

General support for an individual's well-being, however, does not operate alone in promoting positive treatment outcomes. Social influences directly related to substance use behaviors appear to be more relevant for treatment outcome - whether related to support for drinking/drug use or for abstinence. Among 152 subjects who underwent intensive outpatient treatment, both general and alcohol-specific support were predictive

at the three month follow up; however, after fifteen months, only alcohol specific support maintained its predictive utility (Beattie & Longabaugh, 1997). These authors also reported that while perception of a more general social support was related to subjective well-being, only alcohol-specific support from the social network was related to drinking outcome (Beattie & Longabaugh, 1999). These studies confirm the importance of alcohol-specific support on an individual's path towards recovery. However, whether drinking/drug use (negative) support or abstinence (positive) support is more influential remains unclear.

Strong evidence supports a deleterious effect of maintaining relationships with alcohol/drug users during and following addiction treatment (Broome, Simpson, & Joe, 2002; Longabaugh, Wirtz, Zweben, & Stout, 2001; McKay *et al.*, 2005). For example, associating with peers who engaged in drug use or other criminal activity, or living with a drug or alcohol abuser, was correlated with relapse (Broome *et al.*, 2002). Conversely, research also suggests a robust protective effect of maintaining abstinence-specific support in the social network (Havassy, Hall, & Wasserman, 1991; Witbrodt & Kaskutas, 2005; Zywiak, Longabaugh, & Wirtz, 2002). For example, among 221 individuals with alcohol, drug and cigarette use disorders, abstinence-specific support was the most powerful predictor of treatment outcome (Havassy *et al.*, 1991). In all likelihood, support for drinking/drug use as well as support for abstinence play decisive roles in determining treatment outcome.

The notion that individuals who are surrounded by people who support their desire to attain and maintain abstinence fare better than those surrounded by individuals who actively discourage treatment and encourage further use has a long history of

empirical and popular support. Rarely, however, does a given individual find themselves surrounded by a one-dimensional social network; rather, navigating the positive and negative influences of different social network members becomes paramount for treatment outcome. Of 748 patients undergoing short-term, residential treatment for substance use disorders, those who lived with a drug or alcohol user had 3 times the likelihood of using cocaine and 2-1/2 times the likelihood of drinking during the year following treatment (Broome et al., 2002). Conversely, those who reported having abstinence support at home reduced the initial risk of cocaine use by one half. Among 106 residential treatment opiate users, those who relapsed in the first three months post-treatment reported significantly more people in their network who supported their drug use. Among those who did not relapse during this time, the proportion of users in the social network decreased from 26% pre-treatment to 2.6% at three months post-treatment (Hawkins & Fraser, 1987). In a heterogeneous community sample of treatment seekers (n = 302), the proportion of abstinent members compared to size of network as a whole, as well as absolute number of abstinent members in network, predicted positive outcomes for individuals with either alcohol or drug use disorders (Witbrodt & Kaskutas, 2005). This study also identified the number of members who supported the subject's cutting down or quitting as statistically, as well as clinically, related to positive treatment outcomes. More recently, social support was identified as an important predictor of recovery from opiate addiction, regardless of formal treatment (Scherbaum & Specka, 2008).

In their analysis of the Project MATCH data, Zywiak, Longabaugh & Wirtz (2002) found that the presence of abstainers and people themselves in recovery within the

social network accounted for a significant variance in treatment outcome. Participants who had a high ratio of drinkers/users in their social network had more positive outcomes three years after treatment when assigned to a Twelve Step Facilitation group than individuals in other treatment programs that focused less on twelve-step program involvement and social network support. In another study concentrating on drug abusers, thirty-day abstinence post treatment was negatively correlated to support for drinking in the overall social network and positively correlated to support for abstinence from people met in AA in particular (Kaskutas, Bond, & Humphreys, 2002). Humphreys, Moos and Finney (1996) argue that one reason for Alcoholic Anonymous' effectiveness is that problem drinkers become integrated into a structure that provides ongoing, readily available social resources. This enduring structure clearly provides its members with an abstinence-specific support in a manner that encourages social investment. As a member gains experience in remaining abstinent, he or she quickly becomes a mechanism of support for others; being on both sides of this social exchange may serve to reinforce the experience of being part of a social whole.

In addition to the nature (positive/negative) of the support given to an individual seeking recovery, there are other critical components of social support that influence its salience and overall significance. In fact, it may not be sufficient for someone recovering from a substance use disorder to have an appropriately supportive social environment; it also appears necessary that the person be highly "invested" (e.g., dependent on "other people for differential reinforcement or reward") with their network (Longabaugh, Beattie, Noel, Stout, & Malloy, 1993). A person's investment "refers to a person's dependence upon other people for differential reinforcements or rewards. To the extent

that dependency exists, others have the capacity to influence the person...” (Longabaugh et al., 1993). In individuals who displayed only minor investment in their social network, support for abstinence had little effect on their first year post-treatment drinking outcomes. Those who were highly invested (measured by network size, amount of daily contact with network and average importance of most important people), however, were significantly more aided by a positive social environment (Longabaugh et al., 1993). This suggests that it is more than just having abstinence-supporting or drinking-supporting resources; it is also the extent to which an individual utilizes and values these relationships.

All of these findings taken together suggest that it is through its specific function, valence, and direction that a social relationship exerts its power on substance use disorder treatment outcomes. Substance use-specific support can be viewed as existing on a continuum, ranging from active encouragement of further use at one extreme to fostering sustained abstinence at the other. In addition, social support must be conceptualized as dynamic: coming from a variety of often competing influences that change across time. In fact, Project MATCH participants who had strong support for alcohol use pre-treatment, but who demonstrated substantial decreases in this type of support had better outcomes post-treatment than those who maintained these relationships (Longabaugh et al., 2001), thus indicating the importance of changes in an individual’s social environment with respect to their drinking/drug taking trajectories.

While this multidimensional notion of social support presents a formidable challenge for research on the topic, the use of measures that assess social network support features across a wide range of constructs, including importance, frequency of contact, as

well as how the network member views their abstinence, drinking and drug using behaviors and their seeking treatment can do much to further our understanding of this vital aspect of substance use disorder treatment success.

Gender

A large minority of US women report using psychoactive substances (U.S. Department of Health and Human Services, 2003). Gender differences have been noted in relation to drug preference, with women more likely to abuse licit drugs than men, and men more likely to abuse illicit drugs (Nelson-Zlupko, Kauffman, & Dore, 1995). Although there are well documented physiological reasons for the gender differences in substance use disorders, physiology does not tell the entire story. A study of gender differences in drinking from ten countries suggests that gender roles may heighten physiological differences in reactions to alcohol (Kerr-Correa, Igami, Hiroce, & Tucci, 2007; Wilsnack *et al.*, 2000). While women typically drink less than men, and have fewer risk factors associated with the development of alcohol use disorders, their drinking is more likely to result in negative consequences (Nolen-Hoeksema, 2004). In addition, these consequences are likely to happen sooner to the onset of drinking and be more severe than those experienced by men. Thus, while biological discrepancies may form a basis for the differences in alcohol and drug use courses between the sexes, socially maintained gender roles are clearly potent.

Many factors, past as well as current, tend to distinguish women from men in terms of risk for developing alcohol and drug use problems. Social factors, including childhood physical and sexual abuse, co-occurring psychiatric diagnoses (e.g., depression), spouse/partner abuse, and childhood family drug use may disproportionately

increase risk for the development of substance abuse or dependence in women (Brady & Randall, 1999; Dluzen & Liu, 2008; Nelson-Zlupko et al., 1995). Substance use by a spouse/boyfriend may also factor into a woman's decisions on whether, and how much, to drink or use drugs (Brady & Randall, 1999; Manuel, McCrady, Epstein, Cook, & Tonigan, 2007). Further risk stems from the fact that substance abusing women appear to be at an increased likelihood of marrying someone who also struggles with alcohol problems (McCrady, 2004).

Conversely, women tend to score higher on pro-social traits, such as nurturance, which have been found to be protective against excessive drinking (Nolen-Hoeksema, 2004). Social factors that may also decrease the likelihood of women engaging in problematic alcohol and drug use include increased expectancies of social sanctions from problem drinking (Nolen-Hoeksema & Hilt, 2006). Therefore, it is crucial to include cultural and interpersonal factors in attempting to understand how women develop and maintain problematic drinking and drug taking behaviors.

Social norms are thought to be a protective factor for women in the initiation of problematic drinking, but once such drinking has started, the negative consequences from the stricter social norms in place for women become an impediment to treatment seeking. Women are less likely to receive support and/or pressure for treatment from friends and family, and more likely to have a member of their social network actually oppose such behavior (for review, see McCrady, 2004). There are numerous potential reasons for this resistance to treatment by a woman's social network, or by those within the network closest to the addicted individual.

It could be conjectured that husbands or boyfriends may discourage treatment because of their own substance using behaviors. Perhaps, they view the idea of navigating day-to-day familial logistics as more difficult, more expensive or more problematic in the absence of woman (Nelson-Zlupko et al., 1995). This may prove an even larger barrier if the woman is a mother, and she is the primary caregiver. Thus, social influences may have a profoundly negative impact on a woman's decision to seek treatment for problematic substance use, and may also hinder completion of a substance abuse program (Nelson-Zlupko et al., 1995).

Self-perception and perception of social support may additionally contribute to the reluctance of women to enter treatment. Women demonstrate more guilt, depression and anxiety over their substance use, and may have fewer social resources available to them than men (Nelson-Zlupko et al., 1995). Nonetheless, in their naturalistic study of over 400 subjects spanning sixteen years, Moos, Moos & Timko (2006) found that women were more likely to achieve successful outcomes from their alcohol use disorders. Women were also more likely to benefit from AA and experienced greater relief in other areas of their lives (depressive symptoms and avoidant coping) as a result of not drinking. These findings fit well with earlier work suggesting that the number of primary supportive relationships, which AA is likely to increase, was predictive of outcome success for alcohol abusing women (Macdonald, 1987).

Women with substance use disorders may have additional, highly relevant reasons for avoiding treatment. As primary caregivers, women can fear the prospect of lost custodial rights if they were to admit to a substance use problem (Tracy, 1994). Women, especially when poor, have great difficulty in managing the logistics of treatment. Need

for adequate child care and transportation and lack of insurance are frequent barriers that must be overcome in order for treatment to be a viable option (Tracy, 1994).

Furthermore, the treatment system in the US is historically geared towards men, suggesting that little emphasis is placed on the unique needs of women with substance use problems. In fact, as recently as 1990, less than one percent of federal money targeting substance abuse issues was targeted for women's treatment (Child Welfare League of America, 1990).

Given the social and cultural impediments to substance abuse treatment that many women experience, more emphasis, as well as resources, need to be focused on factors that promote women's entry into treatment and their utilization of the available services (Tracy, 1994). Current efforts are underway to shift the focus of standard treatment paradigms to issues more central to women, such as child care, health insurance, relationship building, financial independence, and parenting skills. In addition, inclusion of alternative techniques for coping with stress, identifying sources of psychological and physical assistance and educating women about their bodies and their roles as mothers are becoming more common (Nelson-Zlupko et al., 1995). Moreover, helping women change their social networks in order to support their treatment success, namely by enhancing contact and level of importance of abstinence-supporting relationships is likely to improve outcome (McCrary, 2004).

Despite the considerable social and cultural barriers, women are still more likely than men to seek treatment when relationships become disturbed or role obligations become compromised (for review, see McCrary, 2004). In fact, they may even enter treatment at an earlier stage of their addiction than men (Brady & Randall, 1999). While

the resolution of this apparent paradox is beyond the present scope, it is likely that competing social forces play important roles in both pushing women towards treatment and blocking them from it.

Motherhood

The consideration of women-specific issues in substance abuse treatment requires attention be given to the subset of women who are also mothers. For these women, the repercussions of addiction are often more profound and far-reaching. In addition to being more likely to exhibit depressive symptoms, lack needed social support and experience more difficulties in their environment than other women (Hawley, Halle, Drasin, & Thomas, 1995; Pajulo et al., 2001; Savonlahti, Pajulo, Helenius, Korvenranta, & Piha, 2004), their addiction can prove permanently damaging to the physical health, emotional and psychological well-being, and cognitive capacity of their children (Conners et al., 2003; Hawley et al., 1995; Kerwin, 2005).

Substance use disorders appear to diminish a parent's ability to adequately support a child, physically and psychologically, and may skew a parent's perspective on their child's behavior and emotional state (for review, see Suchman, Mayes, Conti, Slade, & Rounsaville, 2004). In very basic terms, activities involved in the genesis as well as maintenance of a substance use disorder are often diametrically opposed to the activities involved in healthy parenting. Parenting is a labor intensive endeavor, and sustaining a substance use disorder can mitigate a mother's ability to obtain and direct the necessary resources to their children; thus, being under the influence of drugs and alcohol can be directly detrimental to parenting.

Children of parents with substance use disorders are more likely to have behavioral problems and/or special needs (Chatterji & Markowitz, 2001; Jones, Miller, & Salkever, 1999; Puttler, Zucker, Fitzgerald, & Bingham, 1998). In a study of 2,193 children of mothers who met DSM-IV criteria for alcohol abuse or alcohol dependence, sons were more likely to have behavior problems and daughters were more likely to report receiving insufficient emotional and cognitive support at home (Jones, 2007). This pattern can create an escalating cycle of unmet needs: where the neglected and/or abused children develop their own difficulties that require more skilled and attentive parenting; the added stress contributes to increased substance use and emotional distress by the mother (Whitaker, Orzol, & Kahn, 2006); the parental capacities of the addicted mother appear more inadequate; and problems and resentment on both sides are then perpetuated.

It is difficult, if not impossible, to provide the vigilant attention and care that children need when the parent is drunk or high. Similarly, being under the influence of drugs and alcohol can heighten emotional dysfunction, leading to poor decision making and out of control behaviors, such as physical abuse. Sadly, the National Center on Child Abuse Prevention Research reported that, in 85% of states, families suspected of child abuse report major difficulties related to parental substance abuse (National Center on Child Abuse Prevention Research, 2001). Unsurprisingly, substance abuse has been found to be a major contributor to child abuse and neglect (Chaffin, Kelleher, & Hollenberg, 1996; Kelleher, Chaffin, Hollenberg, & Fischer, 1994; Takayama, Wolfe, & Coulter, 1998; Walsh, MacMillan, & Jamieson, 2003).

Unhealthy parenting styles, however, often include behaviors that are not typically associated with physical or emotional child abuse and neglect. For example,

parents vary in their expectations for their children's roles and responsibilities in families and, in certain instances, may believe that their children are essential sources of needed support. In times of duress, these expectations can become reliance on their children for emotional and physical support. In a study of women living in poverty, parentification (i.e., the process by which children assume duties usually performed by parental figures) was associated with negative outcomes for both children and parent (Mickelson & Demmings, 2009). A vicious circle was created in which these parental needs overwhelmed the children, decreasing their sense of well-being, thereby placing even more strain on the parent. This added stress made the mother even more desperate for help, and the cycle continued. Both members were left in worse condition. This study also suggested that episodes of acute stress in the past twelve months (e.g., homelessness, legal problems, economic difficulties, loss of child custody) were related to a heightened reliance on children (Mickelson & Demmings, 2009). Although substance abuse was not part of this study, these stressors are all exacerbated by substance use disorders. This may suggest that neglect as well as heavy reliance on young children may be unhealthy practices that can exacerbate a woman's substance use behaviors.

The aforementioned studies on the complexities of healthy parenting and the negative influence that substance use has on it point to the often conflicting role that children play in a woman's substance use, treatment seeking, and long-term outcome. Unlike women without children, mothers may be highly reluctant to seek treatment; and it is often the children's needs that create the greatest barriers to treatment. Considering that admitting having a substance abuse disorder can lead to their children be taken away, it is not surprising that mothers are more likely to avoid treatment settings. Even if they

decide to seek treatment, the lack of safe and affordable child care can often be an insurmountable obstacle (Howell, Heiser, & Harrington, 1999). Thus, while some women may view their children as the best reason for becoming abstinent, serving as a bastion of determination and hope, other women may see their children as obstacles to treatment and stressors impinging on their chances for recovery.

It is possible that these forces compete within some mothers, leading to a state of cognitive dissonance. Ideally, this dissonance is resolved by the mother realizing that abusing substances is incompatible with her deeply held ideals, leading to the necessary steps to achieve and maintain sobriety. Treatment programs that help women restore proper balance in their relationships with their children through the development of relevant psychosocial and interpersonal skills may be beneficial in this process. Widening the social network and the availability of positive general and substance-use specific social support may help build a healthier environment for mother and child.

Unfortunately, women, and particularly mothers, who suffer from substance abuse disorders still represent an understudied population in addiction treatment research, although that is changing. As such, the field possesses a limited understanding of the role that social support plays in the treatment of mothers who suffer from these disorders. Accordingly, the present study is designed to address this topic by examining the relationship of multiple social constructs to substance use outcomes in a diverse sample of mothers entering treatment for a substance use disorder.

Drug of choice

In addition to social influences and familial responsibilities, intra-individual factors can strongly affect substance use decisions and treatment outcomes. Clear

differences in personality and mood are often reported between people who have current substance use disorders and those who do not. Individuals with substance use disorders act more impulsively (Hanson, Luciana, & Sullwold, 2008; Rubio *et al.*, 2008; Verdejo-Garcia, Lawrence, & Clark, 2008) and have higher sensation seeking personalities (Crawford, Pentz, Chou, Li, & Dwyer, 2003; Martins, Storr, Alexandre, & Chilcoat, 2008). They are more likely to exhibit co-morbid mood disorders than their non-using peers, especially women with a drug use disorder or individuals who are dependent on opiates (Conway, Compton, Stinson, & Grant, 2006). In addition, a co-occurring mood or anxiety disorder is associated with heavier use of marijuana and nicotine (Conway *et al.*, 2006). These findings support the premise that there are general differences in profiles of individuals who have a substance use disorder compared to non-dependent persons. Furthermore, they lay a foundation of evidence suggesting that high risk personality features and co-morbid mood disorders may be specifically associated with certain substance use disorders.

Additional support for differences among substance use disorders stems from evidence that genetic factors or family environment may influence primary drug of choice as well as the risk for dependence itself. Familial transmission of vulnerability for substance use appears to be, at least partially, drug specific (e.g., alcohol, marijuana, cocaine). One study noted that primary drug of choice aggregated in families (Merikangas *et al.*, 1998). Another found that siblings of an individual with a diagnosed substance use disorder often exhibited dependence on the same drug (Bierut *et al.*, 1998). Thus, there is reason to believe that differences between users of different drugs of abuse may exist across a range of personality and sociological domains.

Other evidence for heterogeneity among substance users being associated with differences in primary drug of choice is based in behavioral and psychological research. Individuals who use less socially acceptable substances tend to be less constrained (i.e., more disinhibited and impulsive) than individuals with substance use disorders with more socially accepted drugs (Conway, Swendsen, Rounsaville, & Merikangas, 2002), suggesting that individuals who abuse alcohol may differ categorically from those who, for example, abuse heroin or cocaine. In addition, individuals with heroin dependence demonstrated more novelty seeking, more exploratory excitability (likened to sensation seeking), more antisocial personality traits and less harm avoidance than alcohol dependent individuals (Le Bon *et al.*, 2004). Even among illicit substances, several studies suggest distinct personality profiles. Craig and Olson (1990) identified greater antisocial personality features among cocaine abusers than heroin abusers. Gerra, Bertacca, Zaimovic, et al. (2008) found that cocaine dependent individuals were more aggressive and demonstrated more psychopathic deviance and paranoia than heroin dependent individuals. In contrast, heroin dependence was associated with more social introversion and harm avoidance. Importantly, one study also noted that heroin dependent individuals were less likely to complete treatment compared with individuals with alcohol, cocaine, or marijuana use disorders. (Choi & Ryan, 2006). Taken together, these studies suggest that drug preference may be an important correlate to and, at times, determinant of drug use patterns, trajectories, and treatment outcome.

When the biological responses of these various substances are considered, these personality differences become more understandable; for example, cocaine is a powerful stimulant, whereas heroin is an intense narcotic. Thus, individuals who choose to initiate

use of a sedative versus a stimulant may have pre-existing differences in mood, mindset, or even general life difficulties and thus may be seeking different effects from their “high”. In addition, a person, especially a woman with responsibility to a family or child, who initiates use of an illicit substance that has profound negative social implications, may differ from one who chooses a licit substance such as alcohol.

Whereas personality (e.g., introversion) and mood (e.g., depression) has been found to have profound effects on an individual’s social network (Barnett & Gotlib, 1988; Kawachi & Berkman, 2001), little is known about the differential effects of primary drug of choice on an individual’s social network. Anecdotally, individuals with illicit primary drugs of choice tend to be embedded in more tenuous and erratic social networks. Illicit drug users may demonstrate, for example, more turnover within their social network or may surround themselves with individuals with similar drug use behaviors who support continuation of use over abstinence compared to users of licit substances (e.g., alcohol). In addition, illicit drug users may be more likely to hide their substance use behaviors from those social network members who may provide positive, abstinence-driven support as compared to an alcohol abuser, thus increasing their sense of social isolation and alienation and potentially lowering their investment in these social network members. One recent study demonstrated that baseline social support predicted lower cocaine and heroin use, but not lower alcohol use, following treatment and was unrelated to all substance use prior to treatment (Warren, Stein, & Grella, 2007). This finding suggests that there is likely to be a complex relationship between drug of choice and social support; however, this topic has not received the necessary attention within the

field of addictions research. More research is needed to determine whether drug preferences affect social support.

In conclusion, there is ample evidence demonstrating the effects of social support, gender and motherhood, and primary drug of choice on substance use behaviors and their treatments. However, a thorough knowledge of the nature of the interplay of these functions is yet unknown. Given the scope of substance abuse issues and the vast heterogeneity in the population, the specific nature of these relationships is likely to be even more nuanced and complex than we now understand them to be. As in many other behavioral health fields, the “bottom up” paradigm of research dominates, instructing that in order to gain a coherent understanding of a given phenomena, we must first gain familiarity and knowledge of the individual parts.

This dissertation seeks to characterize the nature of the relationship between social network characteristics and substance use behaviors in a sample of 246 women who have young children and who have been mandated for substance abuse treatment, or who were in danger of being mandated, by the New Jersey Division of Youth and Family Services. Data on the characteristics of these women’s social networks and the nature of their substance use at treatment entry, at the end of treatment, and six months following treatment were collected. The goal is to develop a better understanding of how a mother’s primary drug of choice influences the quality of her social resources and her substance use decision making.

Hypotheses and Predictions

In this dissertation, the effect of social network on substance use is assessed in three ways. First, the composition and characteristics of a mother's social network as well as her substance use behaviors at treatment entry are described across drug preference groups (alcohol, marijuana, heroin, and cocaine). Second, the ability of social network characteristics to influence substance use behaviors concurrently or during subsequent months are characterized. Third, changes in social network characteristics and substance use outcomes over time are compared across drug preference groups. These analyses will allow us to test three general hypotheses: (A) Primary drug of choice will differentiate participants at treatment entry in terms of social network characteristics and substance use behaviors; (B) social network characteristics will influence substance use behaviors over the same time period and during subsequent time periods; and (C) primary drug of choice will influence how a woman's social network and substance use behaviors change during and following treatment. Specific hypotheses are detailed below based on available literature; however, most analyses may be considered exploratory because this study did not contain a control sample (i.e., a sample of women without any substance use disorder diagnosis), thus comparisons are across substance use disorders only.

Social Network Characteristics at Treatment Entry

- 1) Women who report cocaine as their primary drug of choice will exhibit the most dysfunctional social networks at treatment entry as a result of their tendency towards more antisocial, deviant, and paranoid behaviors (Gerra et al., 2008). Predicted differences in the social network features of women who primarily abuse cocaine include: smaller social networks, less contact with network

members, and less importance placed on their network as compared to women who report alcohol or marijuana as their primary drug of choice.

- 2) Individuals with illicit primary drugs of choice (e.g., marijuana, cocaine, heroin) may be embedded in more tenuous and erratic social networks than those who prefer licit drugs (e.g., alcohol) (Conway et al., 2002), and may thus report a social network more supportive of continued substance use, less supportive of abstinence and treatment, and more likely to contain network members who engage in heavy or frequently alcohol or drug use.

Substance Use Behaviors at Treatment Entry

At treatment entry, all participants are expected to demonstrate patterns of heavy and frequent substance use because all were assumed to meet criteria for a substance use disorder at treatment entry. In addition, all women in this study demonstrated substance use behaviors that were severe enough to be placing their child(ren) at high risk; and most, if not all, were expected to be experiencing significant legal problems (i.e., involvement in the NJ Division of Youth and Family Services). Nonetheless, differences across drug preference groups are expected in relation to the patterns of use most commonly associated with a given drug of choice.

- 3) Women who primarily abuse cocaine will report more bingeing and less overall days of use (i.e., less frequent use in the past 30 days) than the other primary drug groups.
- 4) Women who primarily abuse heroin will report more daily use (i.e., more frequent use in the past 30 days) than women in the other primary drug groups, Riley, 1997).

Relationship of Social Networks to Substance Use

- 5) More supportive social networks at treatment entry (identified as networks that are larger, in greater contact with the participant, are generally supportive of abstinence, and demonstrate relatively less substance use among network members) were predicted to have a strong positive effects on substance use reported at the end of treatment (Warren et al., 2007).
- 6) More supportive social networks (identified as networks that are larger, in greater contact with the participant, are generally supportive of abstinence, and demonstrate relatively less substance use among network members) identified at the end of treatment are hypothesized to positively influence substance use outcomes following treatment (at both assessments).

Changes in Social Network Characteristics across Time

- 7) Perceived support for abstinence should increase while perceived support for maintenance of substance use should decrease during and following treatment.
- 8) Changes in the members of the social network should occur such that less substance use among network members will be reported during and following treatment.
- 9) Women who report primary abuse of cocaine will demonstrate the greatest changes to the social networks during and following treatment because they have the furthest to improve.

Changes in Substance Use Behaviors across Time

- 10) In general, substance use is expected to decrease in all primary drug groups during and following treatment.

11) Based on data suggesting that heroin users may be least likely to complete treatment (Choi & Ryan, 2006), it is predicted that women who report heroin as their primary drug of choice will demonstrate the least improvement in their substance use patterns during and following treatment.

CHAPTER II

METHOD

Subjects

Participants for this study included 246 women over the age of eighteen who had at least one child under the age of 18 years of age or were pregnant at the time of treatment entry. These women were recruited between February 2005 and July 2006 from 26 drug and alcohol treatment sites that participated in the Division of Youth and Family Services (DYFS) “MOMS” program throughout New Jersey. The MOMS program is a state initiative that provides specific funding slots for substance abusing women who are pregnant or have minor children. To qualify for these funded slots, women must meet at least one of the following three criteria: (1) they are referred to substance abuse treatment by DYFS personnel; (2) they have an open case with DFYS, but are self-referred to substance abuse treatment; or (3) their substance use is considered to place their children at particularly high risk for future DYFS involvement. For the present study, additional inclusion/exclusion criteria included: no prior MOMS treatment and no other addiction treatment within the past thirty days. Although there was no formal diagnostic procedure implemented in the present study, all participants had significant substance use problems

and were assumed to have met criteria for at least one current psychoactive substance use disorder.

Three hundred and thirty three women completed the initial screening and two hundred and fifty gave their consent and eventually entered the study. Four women were excluded from analysis due to administrative errors at intake. Of the 246 women remaining, 52 were enrolled in one of seven 6-month residential programs, 150 were enrolled in one of twelve drug-free intensive outpatient programs (IOP), and 44 were enrolled in one of seven methadone IOPs. At the end of treatment interview, 86% of clients participated; at the final post-treatment assessment, 91% participated.

Procedures

The present study used a subset of data collected previously as part of a larger project assessing the effectiveness of the NJ Division of Addiction Service's women-specific treatment program (PI: Thomas J. Morgan, Rutgers Center of Alcohol Studies). For the parent study, each participant was first approached by one of the site's staff member who completed a brief form indicating whether or not the participant was interested in meeting with a research staff member; information on the participant's intake site status within the site was also gathered. If the participant was at least eighteen years old, was funded by a MOMS slot, and was interested in hearing more about the study, a release of information form was signed and an interview with a Rutgers University research staff member was scheduled. Informed consent was obtained by Rutgers staff prior to the baseline assessments.

Regardless of treatment site, participants completed a baseline interview within two weeks of treatment entry (Figure 1). Only participants at a residential treatment site completed a during-treatment follow-up interview at four months. They then completed an end of treatment interview at six months after treatment entry and a final follow-up one year after treatment entry (six months post treatment). All others completed an end of treatment interview four months after treatment entry and a final interview ten months after treatment entry (six months post treatment). Participants were offered up to \$90 in vouchers for a range of stores (Walmart, Shoprite, Pathmark, Target, Toys-4-All, and Value City) for their participation in the research project. Participants received \$20 at baseline, \$20 at the end of treatment interview, and \$50 at the 6-month post-treatment interview. This study was approved by the Institutional Review Board of Rutgers University and received a federal certificate of confidentiality.

Measures

The baseline and follow-up interviews included the assessment and discharge modules of the New Jersey Substance Abuse Monitoring System (NJSAMS), a structured interview used to keep a centralized database of all relevant clients served in New Jersey. A subset of the available information from the NJSAMS was utilized in the present analyses.

Demographics

The NJSAMS collects information on the participant's demographic background and includes a series of questions gauging the occurrence of medical, legal, employment, alcohol and drug, family, and psychiatric problems during the immediate past (30 – 60

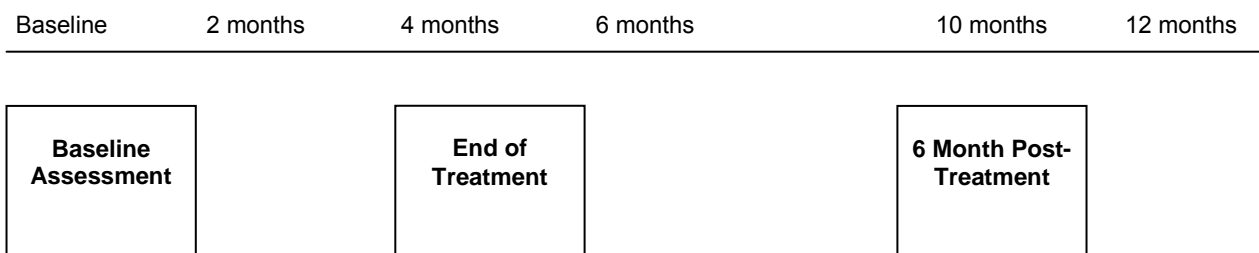
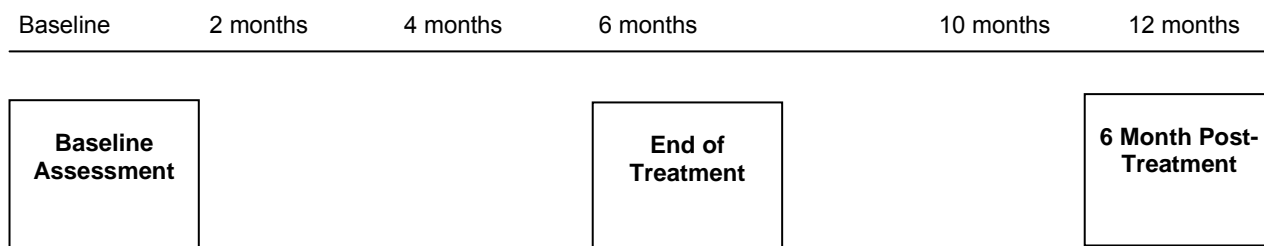
LEVEL OF CARE: Intensive Outpatient /Methadone Intensive Outpatient**LEVEL OF CARE: Long-term Residential**

Figure 1. Timeline of data collection for MOMS Project.

days) and over a subject's lifetime. Information about the women's age, race/ethnicity and religion were assessed as was a subset of other available data. Based on relevance to substance use behaviors, information related to the participants' educational level (coded "1" if they obtained a high school diploma or equivalent), employment status (coded "1" if they were currently unemployed), and religiosity (coded "1" if they declared affiliation with a specific religion including Christian, Jewish or Muslim, coded "0" if they reported no affiliation or selected "other" but did not write in which religion) was assessed.

Physical and psychological health were gauged using measure of overall health (coded on a 5-point scale from "1": excellent to "5": poor), existence of a chronic medical condition (coded "1" if yes), experiencing a psychiatric problem (including depression (for 2 weeks or more), anxiety, hallucinations, problems concentrating/understanding/remembering, problems controlling violent behavior, suicidal thoughts/attempts) in the past 30 days (coded "1" if they had reported experiencing at least one psychiatric problem), and their involvement in risky behavior (drug- and sex-related, including sharing needles, having multiple sex partners, having unprotected sex) in the past 6 months (coded "1" if they reported at least one of these risk behaviors). Problems with the law were assessed using measures of current involvement in legal difficulties (coded "1" if they were currently experiencing legal problems), involvement with child services (coded "1" if they had an active DYFS case), custody problems (coded "1" if they currently did not have custody of all minor children), lifetime arrests (coded "1" if they had ever been arrested) and lifetime incarcerations (coded "1" if they had ever spent time in jail). Women's family and household situations were characterized by the number of minor children they have (including children by birth, marriage, or adoption regardless of whether they were

currently living with the participant), the overall size of their household, the type of living arrangements of the women at treatment entry (coded “1” if living independently, coded “0” if homeless or housed in a dependent or institutional setting), and existence of another person’s substance use problems in their home (coded “1” if yes).

Substance Abuse

The NJSAMS included was a modified version of the Alcohol Severity Index *Lite*, which was given during each interview. The reliability and validity of this shortened version of the ASI has been established (Cacciola, Alterman, McLellan, Lin, & Lynch, 2007). This measure was developed to obtain a multidimensional perspective of addiction severity within the framework of the time limits of each interview. Information pertaining to the use of alcohol as well as nineteen other drugs was collected. Primary drug of choice was determined at the baseline interview by the assessment staff from the Division of Addiction Services. When missing, primary drug of choice was defined as the most frequently used substance over the past 30 days.

In addition to descriptively comparing the average number of days during which the participants used their primary drug of choice and the number of drugs they used in the past 30 days (single substance versus polydrug use), the present study assessed two outcome variables. *Frequency of use* was determined as the number of days during the past 30 days that the participant used their primary drug of choice. This variable was log transformed to correct for skew. *Frequency of problems related to alcohol or drug use* was characterized as the number of days during the past 30 days that the participant reported experiencing problems related to their use of psychoactive substances (e.g., craving, withdrawal symptoms, side effects, wanting to but being unable to stop).

Social Support

A revised version of the Important People and Activities (IPA, Clifford & Longabaugh, 1991) instrument was administered at each interview. The test-retest reliability of the IPA has been established (Longabaugh, Wirtz, & Clifford). The IPA measures the number of individuals (up to 12) in the subject's social network, the importance of these relationships and the amount of contact between the subject and network member. In addition, the IPA asks about the alcohol/drug use of network members as well as the degree to which members of the network are supportive of treatment as well as of drinking or abstinence. The specific questions posed on the IPA are listed in Table 1.

Treatment of Data

Based on prior work with the IPA (Longabaugh et al., 1995), data were recoded and additional variables were created as follows: *Network composition* was assessed after categorizing data from the "Type of Relationship" question as "intimates" (spouse and boy/girlfriend), "family members" (spouse, child, parent, sibling, other relative, young child, and grandchild), "friends", "co-workers", "AA members", "young children" (child or grandchild under 12 years old), "all children" (child over or child under 12 years of age), "ex-partner/spouse", or "other". *The overall size of the network* was calculated by summing all network members listed. *Mean Contact* as well as the number of members with whom the participant had daily contact (*Daily Contact*) were determined. *Mean Importance* of the social network as well as *Mean Level of General Supportiveness* (not specific to substance use) were also calculated.

Table 1
Variables included in the Important Persons and Activities Inventory

Variable	Scale
Type of relationship	Spouse/partner, ex-partner/spouse, boy/girlfriend, child age 12+, child age 0-11, grandchild age 12+, grandchild age 0-11, parent, sibling, other relative, friend, co-worker, AA member, other
Frequency of contact	Once in past 6 months, Less than monthly, About once a month, Every other week, 1-2 per week, 3- 6 times per week, Daily
Importance of network member	Not at all, Not very, Somewhat, Important, Very, Extremely
Network member's <i>general</i> supportiveness	Not at all, Not very, Somewhat, Important, Very, Extremely
Network member's drinking status	Recovering alcoholic, Abstainer, Light drinker, Moderate drinker, Heavy drinker
Network member's drinking frequency	Not in past 6 months, Once in past 6 months, Less than monthly, About once a month, Every other week, 1-2 timers per week, 3-6 times per week, Daily
Network member's drug using status	Recovering user, Abstainer, Light user, Moderate user, Heavy user
Network member's drug using frequency	Not in past 6 months, Once in past 6 months, Less than monthly, About once a month, Every other week, 1-2 timers per week, 3-6 times per week, Daily
Expected/perceived reaction to client's drinking/using drugs	Left, made you leave, Didn't accept, Neutral, Accepted, Encouraged
Expected/perceived reaction to client's not drinking/using drugs	Left, made you leave, Didn't accept, Neutral, Accepted, Encouraged
Expected/perceived reaction of network member to client entering treatment	Strongly oppose, Oppose, Mixed, Neutral, Support, Strongly support

For the remaining items on the IPA, data were recoded as missing for any child under the age of 12 years included in the social network. This was to avoid skewing averages of substance use status and frequency of use among network members and to avoid biasing perceived support measures, as children under the age of 12 may not have been fully aware of problems, fully understood the notions of abstinence or treatment, or had strong opinions of the actions of their mother. The IPA assesses the drinking and drug taking status of network members separately (on a 5-point scale), but for the purposes of this study, these variables were combined into a single *Substance using status* variable. This was accomplished by taking the maximum score of a given network member's drinking status and drug using status (e.g., if a network member was described as a "light drinker" but a "heavy user" of drugs, that member was considered a "heavy substance user"). From these data, *percent of non-users* in the social network was calculated as the number of network members who were considered either "recovering" or an "abstainer" based on the substance use status variable divided by the overall network size. Similarly, the *percent of heavy users* in the social network was determined by summing the number of network members reported to be heavy substance users, and dividing this number by overall network size. As with drinking and drug using status, drinking and drug using frequency of network members was assessed separately, but these variables again were considered together. The frequency of each network member's substance use was defined as the maximum frequency of either their drinking or drug using and an *average frequency of the network's substance use* was then computed. The *percent of frequent users* in the social network was also determined by summing the number of network members reported to be using substances at least "three to six times

per week” (or coded as “6” or “7” on the IPA questionnaire), and dividing this number by overall network size. *Average support for maintaining substance use habits, for abstinence, and for treatment* were calculated from the expected/perceived reactions items (last 3 rows) listed in Table 1.

Data Analysis

All analyses were performed with SAS statistical software (SAS Institute Inc., Cary, NC, version 9.1, 2002-2003). The analytical plan for testing each of the hypotheses is presented below. A power analysis was performed by the PI of the larger project, from which the present data were collected, to determine an adequate sample size for detecting differences in drug use, mental health, and child well-being profiles. This power analysis determined that at a significance level of 0.05 and with statistical power greater than 85% and correcting for attrition at the two follow-up points, that recruitment of 225 women was sufficient. The present study did not collect additional data nor did it recruit additional participants. Further, due to the lack of a control sample, all analyses in the present dissertation were considered exploratory. Thus, the size of the differences expected across groups was unknown and additional power analyses were not performed.

Analysis Plan

Hypothesis 1: The NJSAMS provides extensive information about the demographic features and substance use behaviors of clients entering treatment. The IPA questionnaire similarly offers a rich source of information about social network characteristics. To provide an overall description of the women participants in the present study, mean (+/- standard deviation) values of the overall sample (n=246) for each

demographic, substance use, and social network variable described earlier are presented. Comparisons are then made between women with different primary drug preferences (alcohol, heroin, marijuana, and cocaine). Demographic differences are statistically compared, using analysis of variance (ANOVA) and chi-square tests, as these variables were assessed at baseline only. Post-hoc analyses for the ANOVAs were done using Tukey's Studentized Range test. Social network variables and substance use behaviors are descriptively compared but not subjected to statistical analysis in this section; rather these data are included in the analyses planned as part of Hypothesis 3 (see below). The inclusion of descriptive comparisons here is to provide a multifaceted perspective of the participants when they enter treatment.

Hypothesis 2: To determine the relationship between social network variables and frequency of past 30 day use and substance use-related problems, a series of multiple regressions were performed using two independent approaches. First, variable intercorrelations and the conceptual and theoretical meaningfulness of each variable were used to guide variable selection. Primary drug of choice was dummy coded; three variables separately characterizing marijuana users, cocaine users, and heroin users were created and alcohol users were used as the comparison group based on hypotheses that individuals who use licit drugs would demonstrate less deviant social networks than those using illicit substances. These models were calculated with demographic and general risk characteristics added in the first step and social network variables added in the second step. Statistically significant increases in R^2 between Step 1 (demographic/risk variables only) and Step 2 (with social network variables included) were calculated. Four separate hierarchical multiple regressions were performed for both frequency of substance use

(log transformed) and frequency of substance use-related problems. These analyses allowed assessment of social factors and substance use during overlapping time periods (e.g., social network during the 6 months prior to treatment and substance use during the 30 days prior to treatment) as well as social factors in the time period immediately preceding the substance use assessment (e.g., social network during the 6 months prior to treatment and substance use during the 30 days prior to end of treatment).

Hypothesis 3: Based on the prediction that a woman's social network characteristics and her perceived social support would change over time and that these changes would be influenced by drug preference, repeated measures ANOVAs were calculated. Based on the high intercorrelations between the social factor variables created from the IPA, only a subset of social network characteristic variables were analyzed. Some variables (e.g., those associated directly with different types of social support) were retained for analysis despite high intercorrelations. The between group variable was primary drug of choice (alcohol, marijuana, heroin, cocaine). Within-subjects analysis was assessed across three time points: treatment entry, end of treatment, and 6 months post-treatment. Within-subjects comparisons were made between all time points. Interaction terms determined whether changes in social support or substance use outcomes differed by primary drug of choice group. Tukey's Studentized Range test was used for post-hoc comparisons between groups.

CHAPTER III

RESULTS

Description of the Overall Sample at Treatment Entry

Demographic Characteristics

The average age of the women participants in this study was 32.4 (SD: 8.5) with 51% identifying their race as white and 49% identifying their race as black. Fourteen percent of women identified their ethnicity as Latina/Hispanic. The majority of women in this sample (68%) reported their religion as Christian; 3% identified as Muslim and 0.5% as Jewish. A non-specified (“other”) religion was reported by 4% of the sample and 25% reported not having a religion. Less than 25% were married or living as married at treatment entry. They reported an average of 2.8 (SD: 1.9) children, with an average of 2.5 (SD: 1.7, range 0-11) under the age of eighteen. Almost 9% were pregnant at treatment entry.

The present sample of women was identified as at high risk for personal and familial problems. Forty-five percent had not earned a high school degree or equivalent, and almost three-quarters were unemployed (Table 2). The majority of participants had an active DYFS case, indicating that at the time of assessment, they did not have custody

of their minor child(ren), or were in jeopardy of losing it. In either case, they had been assigned a state appointed supervisor to ensure the safety of the children. Nearly 66% of women reported having a child living with someone else at the time of treatment entry (Table 2). Current legal problems were common in this sample and more than 44% had been incarcerated at some point. Finally, while the majority of women in the study reported that their overall health was “good” or better, 21% of the sample reported sharing needles, having multiple sexual partners, and/or having unprotected sex in the past six months (Table 2).

Table 2
General risk characteristics of the whole sample

Risk Characteristic	Percent
No high school diploma	45
Unemployed	73
Health reported as “fair” or “poor”	25
Psychiatric condition in past month	41
Medical condition in past month	34
Engaging in risky behaviors ^a in past 6 months	21
Active case with the Division of Youth and Family Services	87
Lost custody of a child	65
Mandated to treatment	70
Current legal problems	83
Lifetime arrest	61
Lifetime incarceration	44

^a Risky behaviors included sharing needles, having multiple sexual partners, and/or having unprotected sex

Social Network Characteristics

At treatment entry, participants were asked about their social network in the six months prior (Table 3). Overall, they reported an average of approximately six members in their social network, with two thirds of network members being comprised of family members and, to a lesser degree, friends. Participants' children accounted for greater than 20% of the overall social network. Less than 1% of the networks were made up of active Alcoholics Anonymous (AA) members.

On average, participants had frequent contact (almost 3-6 times per week) with their network members and had daily contact with just over half of their social network members. They perceived their network members as “very” to “extremely” important, on average. They also viewed their network members as generally supportive, and perceived that their network supported their abstinence, identifying members as accepting or encouraging non-use. They also reported considerable support for treatment. On average, women reported that network members were “neutral” or “didn't accept” their continued substance use. Women reported that the average frequency of network substance use was low; a code of “2” for this variable indicated frequency of use as “less often than monthly”, and that the majority of their network was comprised of abstinent or light substance users.

Substance Use Characteristics

The plurality of the present sample (34%) identified heroin as their primary drug of choice; 30% identified Cocaine/Crack, 20% identified Marijuana, and 16% identified alcohol. Poly-drug use was common (36%). Most of the women in the study (61%) entered intensive outpatient (IOP) treatment, 21% entered residential treatment, and 18%

Table 3
Social network and perceived social support at treatment entry

Social Support Variable	
Network Size	5.74 ± 2.65
Network Composition	
% Intimates	12%
% Family	67%
% Friends	17%
% Co-workers	0.5%
% AA members	0.5%
% Child under 12	13%
% Any child	21%
% Ex-partner/spouse	3%
% Other	7%
Contact	
Average frequency of contact	5.90 ± 1.00
% with whom they had daily contact	52%
Average importance of network	5.29 ± 0.62
Perceived support	
General support	4.93 ± 0.94
For abstinence	4.68 ± 0.50
For drinking/drug use	2.42 ± 0.66
For treatment	5.61 ± 0.55
Average frequency of drinking or drug use, whichever is greater, of network members	1.92 ± 1.59
Substance users in network	
% of non-users in network	44%
% of abstinent/light users in network	69%
% of heavy users in network	7%
% of frequent users in network	32%

entered methadone IOP treatment. On average, the women across all drug of choice groups reported using drugs or alcohol on approximately 8 days and experiencing alcohol/drug problems on approximately 9 days in the last thirty days (Table 4).

Table 4
Average substance use, problems, and consequences reported prior to treatment entry

Substance use characteristics	Mean \pm SD
Frequency of use (0-30)	8.19 \pm 11.19
Frequency of alcohol or drug problems (0-30)	9.33 \pm 12.53

Drug Preference Differentiates Participants at Treatment Entry

Demographic Characteristics

Table 5 shows the demographic make up of participants by their primary drug of choice. Participants who identified marijuana as their primary drug of choice were both younger ($F_{(3, 245)} = 10.20, p < .0001$) and reported having better overall health ($F_{(3, 199)} = 6.29, p < .01$) than the rest of the sample. Race also varied across drug of choice categories ($\chi^2(6) = 14.51, p < .05$). The majority of participants who reported their primary drug of choice as alcohol reported their race as white; whereas the majority of participants who reported their primary drug of choice as cocaine/crack or as marijuana reported their race as black. Among those who reported their ethnicity as Hispanic, 15% reported heroin as their primary drug of choice versus only 1% reporting marijuana.

Although the majority of participants within each primary drug group reported being unemployed, primary heroin users experienced the most severe levels of unemployment ($\chi^2(3) = 10.81, p < .05$, Table 5). Significant differences were also noted

Table 5
Demographic variables categorized by primary drug of choice

	Alcohol (n = 40)	Heroin (n = 83)	Marijuana (n = 49)	Cocaine (n = 74)
Age	34.5 (7.7)	33.4 (7.4)	26.8 (5.8) ^a	34.0 (10.1)
Overall quality of health ^b	3.2 (1.1)	3.2 (0.7)	2.4 (1.1) ^b	2.9 (0.8)
Household Size	2.4 (1.6)	2.4 (1.9)	2.7 (2.0)	2.4 (1.6)
# of children under 18	2.6 (1.4)	2.0 (1.3)	2.5 (1.7)	2.7 (2.0)
Race				
White, Non-Hispanic	55%	51%	25%	35%
Black, Non-Hispanic	32%	34%	56%	55%
Hispanic	13%	15%	1%	10%
Unemployed	57%	86%	68%	75%
Psychiatric problems (past month)	32%	50%	33%	45%
Chronic medical condition	39%	37%	24%	35%
Living with an SUD	8%	15%	2%	21%
Living independently	97%	70%	89%	80%
Lifetime arrest	53%	72%	49%	65%
Identifying with specific religion	69%	72%	67%	73%

^a Marijuana group was significantly younger than all three other groups ($p < .05$)

^b Marijuana group reported significantly better health (lower score) than all three other groups ($p < .05$)

for percent of women living with someone who met criteria for an SUD ($\chi^2(3) = 8.86$, $p < .05$) and percent of women living independently ($\chi^2(3) = 13.50$, $p < .01$). Participants who reported cocaine or heroin as their primary drug of choice were substantially more likely to be living with someone who met criteria for an SUD than women who reported

marijuana or alcohol as their primary drug of choice. In addition, primary heroin users were least likely to be living independently. Although those who identified heroin as their primary drug of choice were also the most likely to have been arrested in their lifetime and to have had a psychiatric problem in the last month, these differences were not significant.

Social Network Characteristics

In general, the social network characteristics of women in the four primary drug of choice groups were similar (Table 6). Subtle differences, however, were noted mostly in relation to the marijuana group. Although not statistically compared, this primary drug group appeared to report a somewhat smaller overall network. They reported the smallest percent of friends in their social networks, but substantially more ex-partners or ex-spouses (*data not shown*). However, they did appear to have slightly greater contact, similar to the alcohol primary drug, compared to the heroin and cocaine primary drug groups. In addition, the marijuana primary drug group reported the lowest percent of non-users and the greatest percent of frequent users in their social network. They also appeared to have networks slightly more likely to be neutral towards their continued substance use compared to the other primary drug groups.

Substance Use Characteristics

Table 7 describes the frequency of women's use of their primary drug of choice over the past 30 days, categorizing use as not occurring, occurring on less than half of the days, or occurring on more than half of the days. A large proportion of each primary drug group (43-56%) reported not using their primary drug of choice in the past thirty days. However, whereas relatively few participants (11-16%) who reported alcohol, marijuana,

Table 6
Differences in social network characteristics at treatment entry based on primary drug of choice

	Alcohol	Heroin	Marijuana	Cocaine/ Crack
Network Size	6.53 ± 2.87	5.40 ± 2.70	5.08 ± 2.09	6.12 ± 2.68
Contact				
Frequency of contact	6.10 ± 0.93	5.78 ± 1.06	6.17 ± 0.73	5.75 ± 1.07
% daily contact	59%	50%	58%	48%
Importance of network	5.25 ± 0.61	5.29 ± 0.65	5.18 ± 0.72	5.40 ± 0.52
Perceived support				
General support	4.98 ± 0.88	4.71 ± 0.98	4.87 ± 1.13	5.20 ± 0.71
For abstinence	4.73 ± 0.43	4.69 ± 0.45	4.59 ± 0.53	4.70 ± 0.57
For drinking/drug use	2.38 ± 0.62	2.41 ± 0.65	2.66 ± 0.77	2.32 ± 0.61
For treatment	5.64 ± 0.45	5.58 ± 0.60	5.49 ± 0.60	5.70 ± 0.49
Frequency of substance use among network members	1.99 ± 1.21	1.85 ± 1.66	2.30 ± 1.67	1.71 ± 1.60
% of non-users	40%	48%	35%	48%
% of abstinent/light users	70%	69%	64%	71%
% of heavy users	4%	9%	9%	6%
% of frequent users	33%	30%	42%	28%
% of frequent users	33%	30%	42%	28%

Table 7
Frequency of use of primary drug of choice during 30 days prior to treatment entry

	Alcohol	Heroin	Marijuana	Cocaine
Average #days using	4.76 ± 8.77	13.94 ± 13.15	6.14 ± 9.57	6.86 ± 10.19
% reporting no use	53%	43%	56%	47%
% using 1–15 days	37%	17%	28%	39%
% using 16–30 days	11%	40%	16%	14%

and cocaine as their primary drugs of choice reported using on more than half of the days in the past month, 40% of the participants who reported heroin as their primary drug of choice did. In fact, heroin using women reported a mean of almost 14 days of use in the past thirty days, more than double the days reported by women in the other primary drug groups. Further analysis revealed that, as hypothesized, the heroin group (30%) was more likely to report daily use of their primary drug of choice in the past 30 days compared to the alcohol (8%), marijuana (7%) and cocaine (6%) groups.

Similar to primary drug of choice self reports, a considerable portion (25% to 45%) of women in each drug group reported that they had not used alcohol or any other

Table 8
Percent of women reporting poly-drug use (including alcohol) during 30 days prior to treatment entry

	Alcohol	Heroin	Marijuana	Cocaine
No use	45%	25%	33%	33%
Use of one drug (including alcohol)	37%	21%	47%	26%
Use of more than one drug	18%	55%	21%	41%

drug in the past thirty days. However, participants who reported heroin as their primary drug of choice were the most likely to report the use of two or more drugs in the past thirty days (Table 8). Conversely, those who reported marijuana as their primary drug of choice were the most likely to report the use of only one drug.

Social Factors Influence Substance Use Behaviors

A number of social network variables calculated from the IPA were highly intercorrelated (Tables 9 and 10) at each time point. To minimize issues of multicollinearity within the regression models and to reduce the overall number of statistical analyses performed, a subset of social network characteristic variables that most clearly represent distinct elements of the network and its support characteristics were selected. Data reduction was guided by the correlation matrices from each time point and the conceptual meaningfulness of the variable. Based on these criteria, social network characteristic variables were reduced to include: network size, the percent of network members with whom the client had daily contact, the average frequency of substance use by network members, and the perceived support for abstinence, treatment, and continued use.

Hierarchical multiple regression analyses were performed to determine whether the support a woman's receives (or perceives) from her social network influences her substance use behaviors. Models sought to determine the association of social support characteristics to substance use and/or substance use-related problems over the same time period and the predictive value of social support characteristics at an earlier time point on substance use and/or substance use-related problems at a later time point. Based on

Table 10.
Intercorrelations of Social Network Variables Reported at End of Treatment (above diagonal) and 6-months Post-Treatment (below diagonal)

	<u>1</u>	<u>2</u>	<u>3</u>	<u>4</u>	<u>5</u>	<u>6</u>	<u>7</u>	<u>8</u>	<u>9</u>	<u>10</u>	<u>11</u>	<u>12</u>	<u>13</u>
1 Network size		-0.24	-0.30	-0.08	-0.12	0.16	-0.01	-0.02	0.03	-0.09	0.03	0.03	-0.17
2 Frequency of contact	-0.06		0.81	0.32	0.27	0.07	-0.11	0.19	-0.16	0.10	-0.28	-0.21	0.15
3 % in daily contact	-0.06	0.78		0.23	0.16	-0.03	-0.04	0.14	-0.15	0.09	-0.15	-0.16	0.09
4 Importance of network	0.03	0.32	0.29		0.63	0.23	-0.20	0.31	-0.26	0.10	-0.33	-0.35	0.10
5 General support	-0.04	0.19	0.14	0.67		0.39	-0.25	0.41	-0.31	0.20	-0.37	-0.32	0.25
6 Support for abstinence	-0.03	0.11	0.12	0.43	0.56		-0.28	0.29	-0.19	0.07	-0.20	-0.15	0.20
7 Support for continued use	-0.10	-0.04	-0.07	-0.36	-0.41	-0.42		-0.15	0.28	-0.14	0.45	0.34	-0.23
8 Support for treatment	0.01	0.01	0.09	0.31	0.45	0.44	-0.32		-0.15	0.07	-0.19	-0.03	0.10
9 Network use frequency	-0.01	-0.01	-0.02	-0.36	-0.41	-0.32	0.37	-0.44		-0.77	0.45	0.69	-0.59
10 % of non-users	-0.10	-0.04	-0.07	0.11	0.29	0.21	-0.23	0.35	-0.79		-0.27	-0.40	0.66
11 % of heavy users	-0.12	-0.10	0.02	-0.35	-0.42	-0.28	0.27	-0.28	0.53	-0.29		0.65	-0.39
12 % of frequent users	-0.06	-0.07	-0.07	-0.45	-0.44	-0.27	0.38	-0.30	0.69	-0.39	0.67		-0.50
13 % of abstinent/light users	-0.15	-0.06	-0.11	0.08	0.27	0.17	-0.26	0.27	-0.57	0.59	-0.45	-0.52	

correlations between demographic and outcome variables, race (white, non-Caucasian vs. non-white), living with a substance use disorder, experiencing a psychiatric problem in the past 30 days, number of children under the age of 17 as well as primary drug of choice groups (dummy coded, using primary alcohol users as the comparison group) were included in Step 1 of the analysis. Initially, level of care (i.e., residential treatment versus intensive outpatient treatment) was included in the models; however, it did not significantly predict any outcome measure and was subsequently dropped. In Step 2, network size, percent of network members with whom the client had daily contact, the average frequency of substance use by network members, and the perceived support for abstinence were added to the models. Perceived support for abstinence was selected over perceived support for maintenance of use and for treatment because it was most strongly correlated with the outcome measures.

Greater frequency of substance use at treatment entry was associated with being a minority and reporting primary heroin use ($R^2 = 0.12$). Frequency of substance use at the end of treatment was not statistically associated with any demographic variable ($R^2 = 0.06$). Greater frequency of substance use 6-months post-treatment was associated with the number of minor children a woman had ($R^2 = 0.09$). Greater frequency of substance use problems at treatment entry was associated with experiencing a psychiatric problem in the past month and reporting primary heroin use ($R^2 = 0.22$). Greater frequency of substance use problems at the end of treatment was associated with living with another person with a substance use disorder ($R^2 = 0.09$). Frequency of problems post-treatment was not statistically associated with any demographic variable ($R^2 = 0.02$).

When social network variables reported at treatment entry were included in the second step of the analyses, there were no significant increases in R^2 . Thus, the characteristics of a woman's social network during the 6-months prior to treatment entry are not correlated with frequency of substance use or related problems in the 30 days prior to treatment entry or prior to the end of treatment (*data not shown*). However, when social network variables reported at the end of treatment were included, there were statistically significant increases in R^2 such that specific features of a woman's social network reported at the end of treatment, namely support for abstinence and frequency of substance use by network members, were associated with substance use behaviors both over the same time period as well as during the subsequent six month period (Table 11). More specifically, end of treatment social network features were associated with the frequency of substance use ($\Delta R = 0.23$, $p < .01$) and substance use problems reported at end of treatment ($\Delta R = 0.16$, $p < .01$). In both cases, support for abstinence was inversely related to frequency of use ($\beta = -0.21$, $p < .01$) and use problems ($\beta = -0.26$, $p < .01$), whereas frequency of use by network members was directly related to the client's use ($\beta = 0.42$, $p < .0001$) and use problems ($\beta = 0.26$, $p < .01$). End of treatment social network characteristics, most notably frequency of network member use, also predicted use ($\Delta R = 0.21$, $p < .01$) and use-related problems ($\Delta R = 0.08$, $p < .01$) during the subsequent six month period (Table 11). Finally, when social network variables reported at the post-treatment follow-up were included, there were statistically significant increases in R^2 for the frequency of substance use ($\Delta R = 0.10$, $p < .01$) and problems ($\Delta R = 0.07$, $p < .05$) during the 30 days prior to this follow-up. In these cases, only frequency of use by network members was associated with the client's use ($\beta = 0.25$, $p < .01$) and use

Table 11
Social network characteristics at the end of treatment predict substance use frequency six months later

Variable	Frequency of Use			Frequency of Problems		
	Post-Treatment Follow-up			Post-Treatment Follow-up		
	<i>B</i>	SE <i>B</i>	β	<i>B</i>	SE <i>B</i>	β
Covariates						
Race	-0.28	0.82	-0.14	0.60	1.23	0.04
Living with an SUD	-0.02	0.16	-0.01	1.48	1.76	0.07
Past Month Psychiatric Problems	-0.12	0.23	-0.06	-0.12	1.16	-0.01
# of Minor Children	-0.11	0.15	-0.18*	-0.09	0.37	-0.02
Marijuana User	0.12	0.05	0.05	0.76	1.73	0.05
Cocaine User	0.10	0.23	0.05	1.55	1.61	0.10
Heroin User	0.02	0.21	0.01	1.24	1.67	0.08
Network Characteristics at Treatment Entry						
Network Size	-0.06	0.03	-0.14	-0.36	0.26	-0.12
% Members with Daily Contact	0.00	0.00	0.00	-0.00	0.02	-0.02
Support for Abstinence	-0.38	0.16	-0.18*	-2.38	1.25	-0.16
Frequency of Use by Network	0.26	0.05	0.39**	0.82	0.40	0.18*

SUD = Substance Use Disorder, * = $p < .05$, ** = $p < .01$

problems ($\beta = 0.23$, $p < .01$). Taken together, these data indicate that the characteristics of a woman's social network during and following treatment are associated with substance use behaviors.

Drug Preference Influences

Changes in Social Networks and Drug Use over Time

Repeated measures ANOVA was used to assess how changes in social network characteristics, including network size, the percent of network members with whom the client had daily contact, the average frequency of substance use by network members, and the perceived support for abstinence, treatment, and continued use, was affected by a woman's primary drug of choice. Within group (across time) and between group comparisons were made and interactions were assessed. Changes in drug use over time, including changes in frequency of substance use and use-related problems in the 30 days prior to the assessment were also statistically analyzed in this fashion in relation to drug of choice.

Changes in Social Network Characteristics

There was a significant decrease in the overall social support network size from treatment entry to six months post-treatment in all primary drug groups [$F(2,192) = 26.08, p < .0001$; Figure 2]. Differences in the percent of network members with whom the client had daily contact were non-significant across time or between groups; however, some distinctions in patterns of contact across time were noted (Figure 3). Namely, primary marijuana and alcohol users reported greater daily contact with their network following treatment than did the primary heroin and cocaine users.

Participants in all primary drug groups reported a significant decrease in the mean frequency of their network member's substance use over time [$F(2,192) = 6.65, p < .01$; Figure 4]. A significant interaction revealed that women who reported marijuana as their primary drug of choice also reported a significantly higher mean frequency of substance

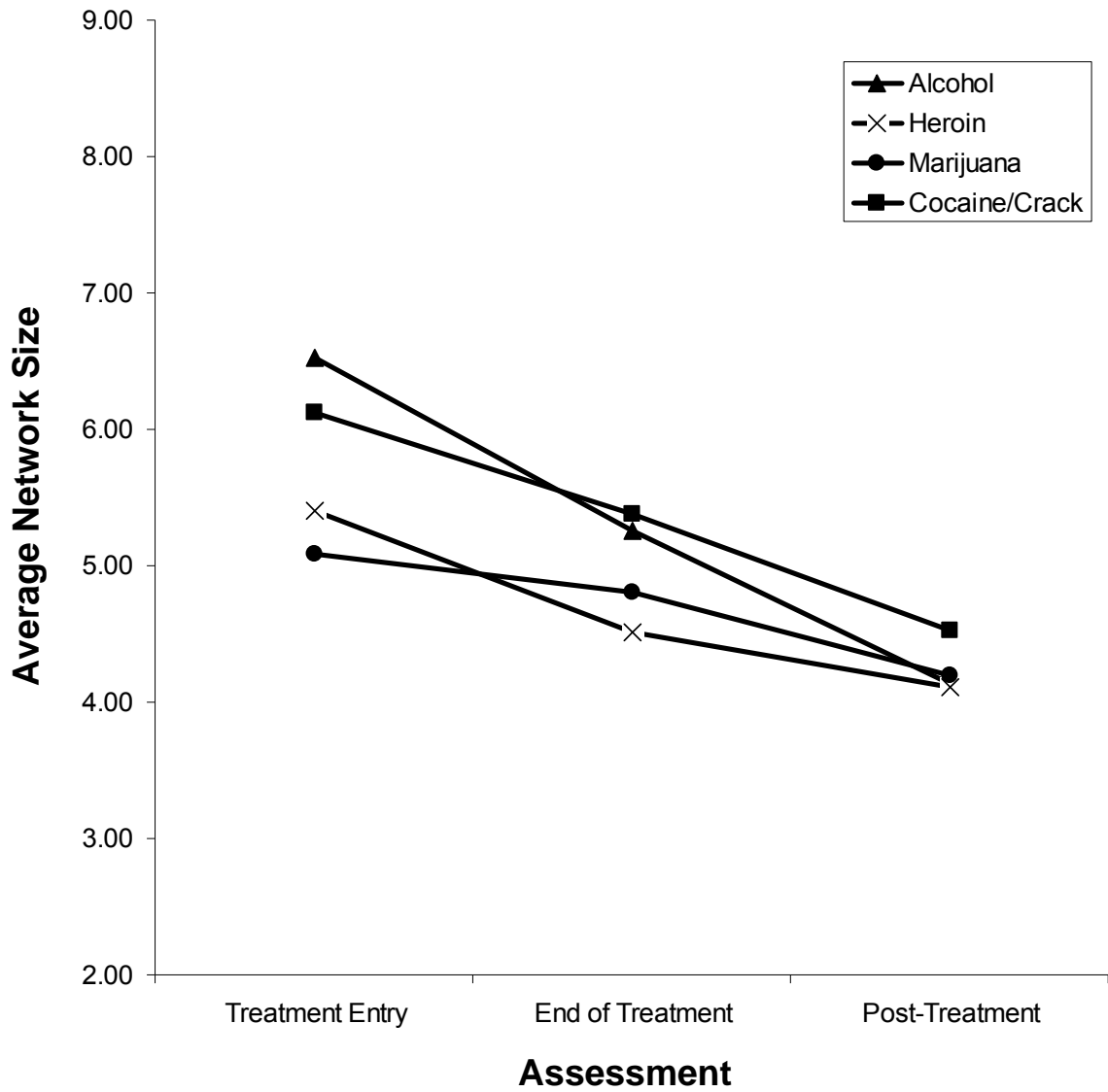


Figure 2. Average size of social network prior to and following treatment.

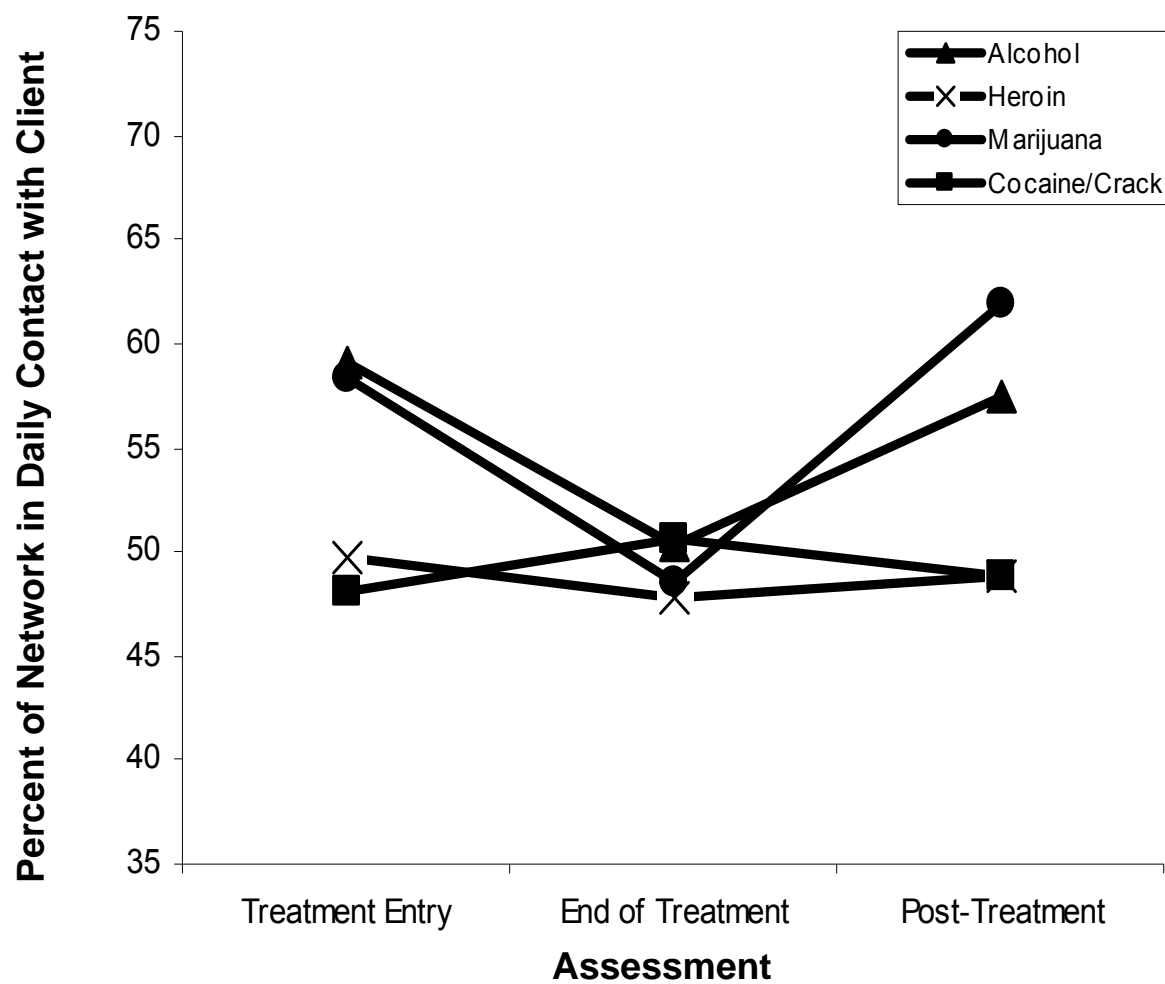


Figure 3. The average number of days participants were in contact with their network members.

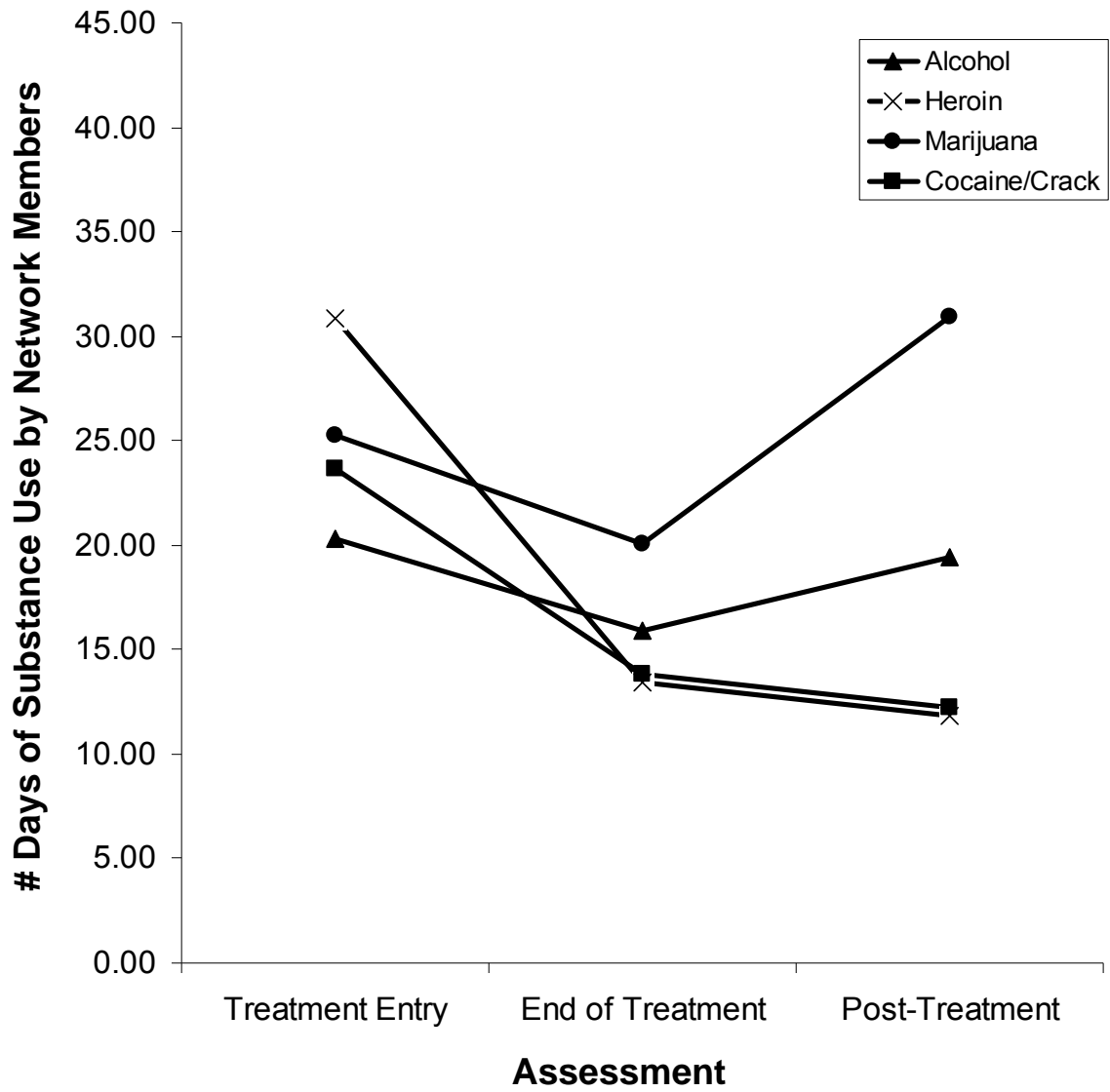


Figure 4. The frequency of substance use among network members.

use among their network members at the 6-month post-treatment baseline than women who reported heroin and cocaine as primary drugs of choice [$F(3,386) = 2.92, p < .01$]. Participants in all drug of choice groups reported experiencing a significantly more positive reaction from their social network regarding their abstinence across time [$F(2,191) = 3.22, p < .05$], although this increase was subtle (Figure 5). In all cases, average reactions to abstinence were reported to be between “Accepted” and “Encouraged” (i.e., a score of $\sim 4.7 - 4.8$). There was a trend towards a between-group difference [$F(3,192) = 2.45, p < .07$]; likely associated with the marijuana drug of choice group reporting slightly less support for abstinence at all time points compared to all three other drug of choice groups.

Participants in all drug of choice groups also reported that they perceived significantly greater disapproval for their continued substance use from their social network across time [$F(2,191) = 12.98, p < .0001$]; again, this change was subtle, with all averages reported to be between “Didn’t Accept” and “Neutral”, and occurred between the beginning and end of treatment (Figure 6). Although there was a significant between-group difference [$F(3,192) = 3.64, p < .05$], the post-hoc analyses revealed difference only between the marijuana and cocaine primary drug groups at the 6-month post-treatment follow-up. There were no significant differences in perceived support for treatment between groups or across time (Figure 7). In all groups and at all time points, the participants in this study perceived “support” or “strong support” for entering treatment for substance use disorders.

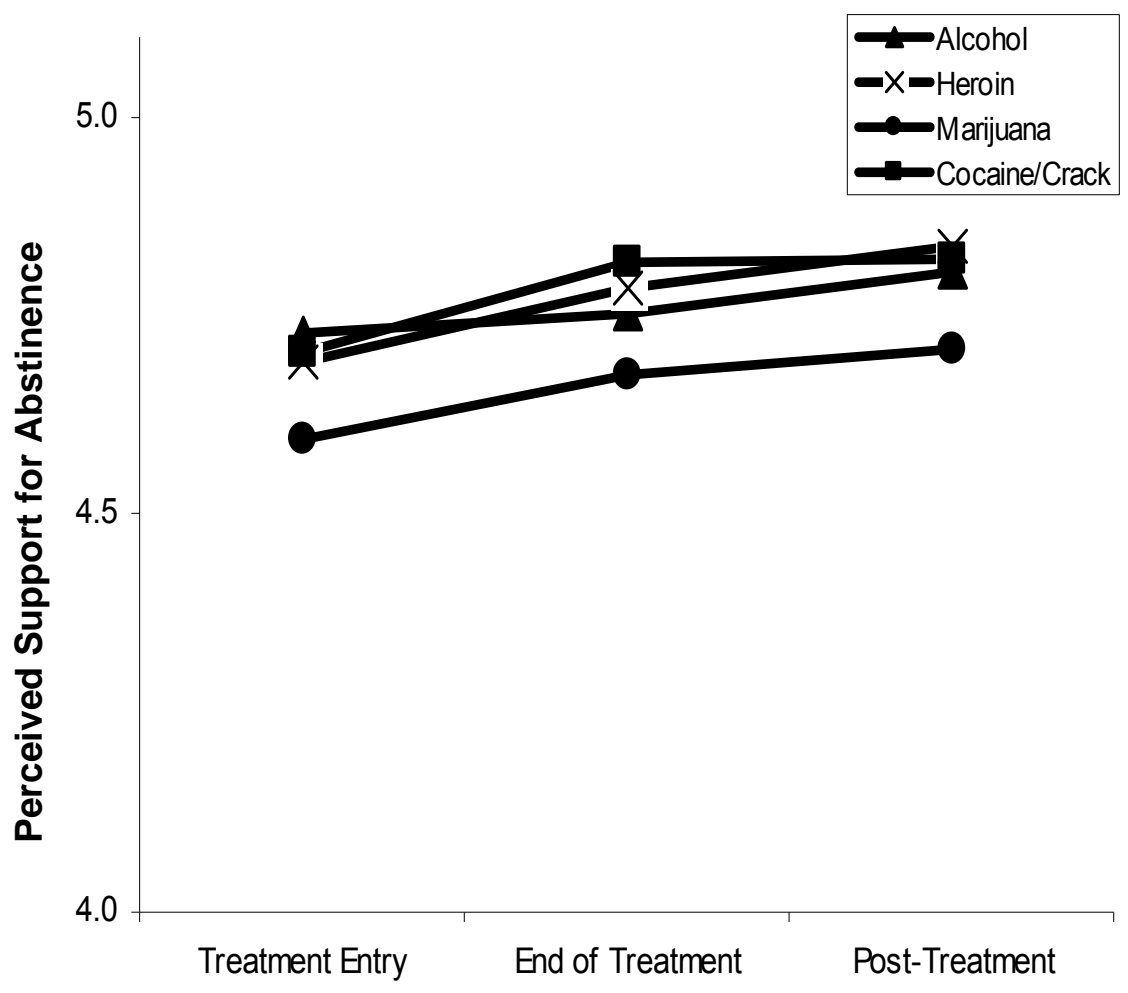


Figure 5. Average perceived support for abstinence from network members. Note: This variable was scored on a 5-point scale from “1: Left, or made you leave when you were drinking/using drugs” to “5: Encouraged.” The scale of this graph has been compressed to illustrate subtle group differences.

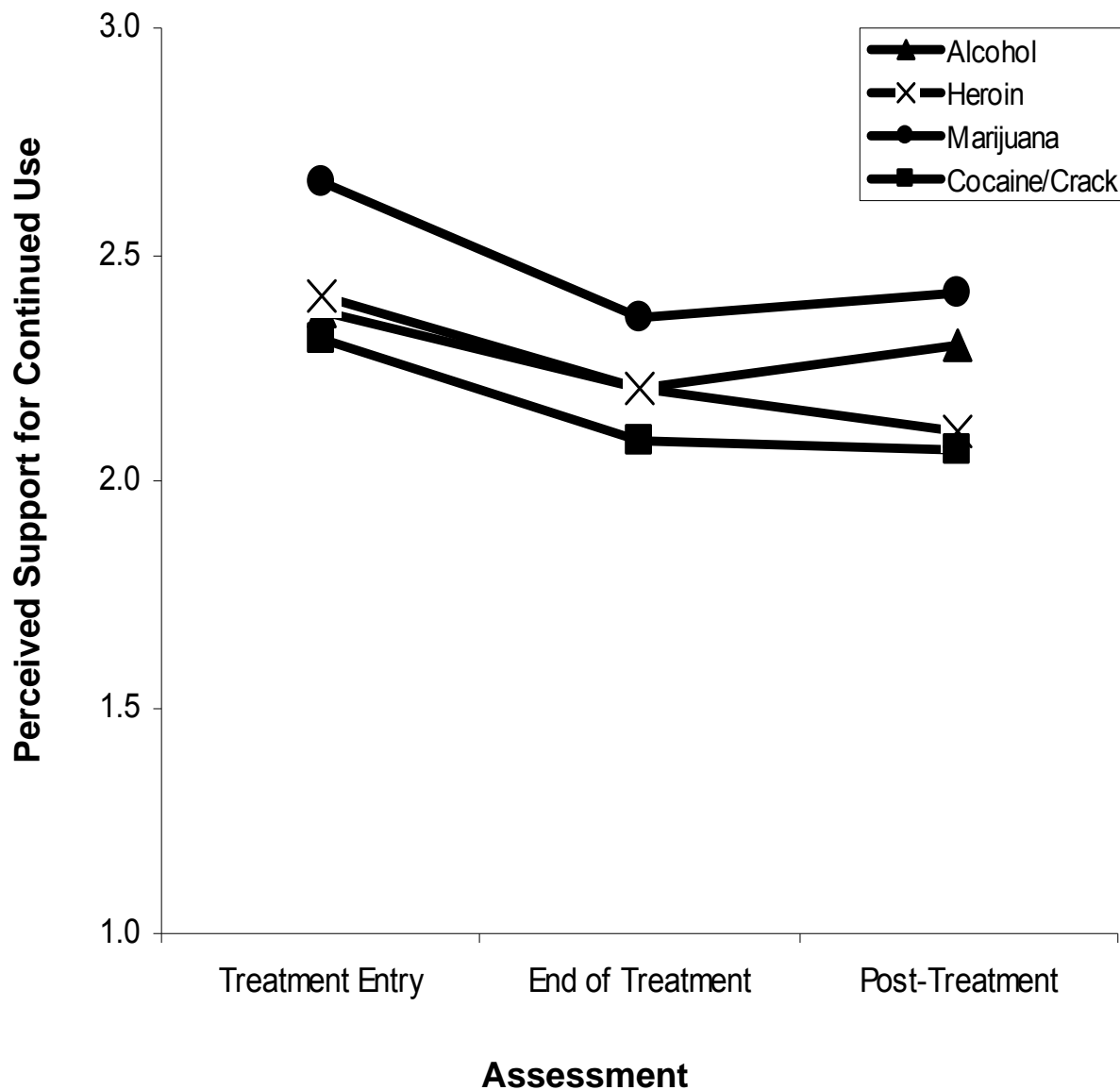


Figure 6. Average perceived support or reaction to maintaining substance use from network members. Note: This variable was scored on a 5-point scale from “1: Left, or made you leave when you were drinking/using drugs” to “5: Encouraged”. The scale of this graph has been compressed to illustrate subtle group differences.

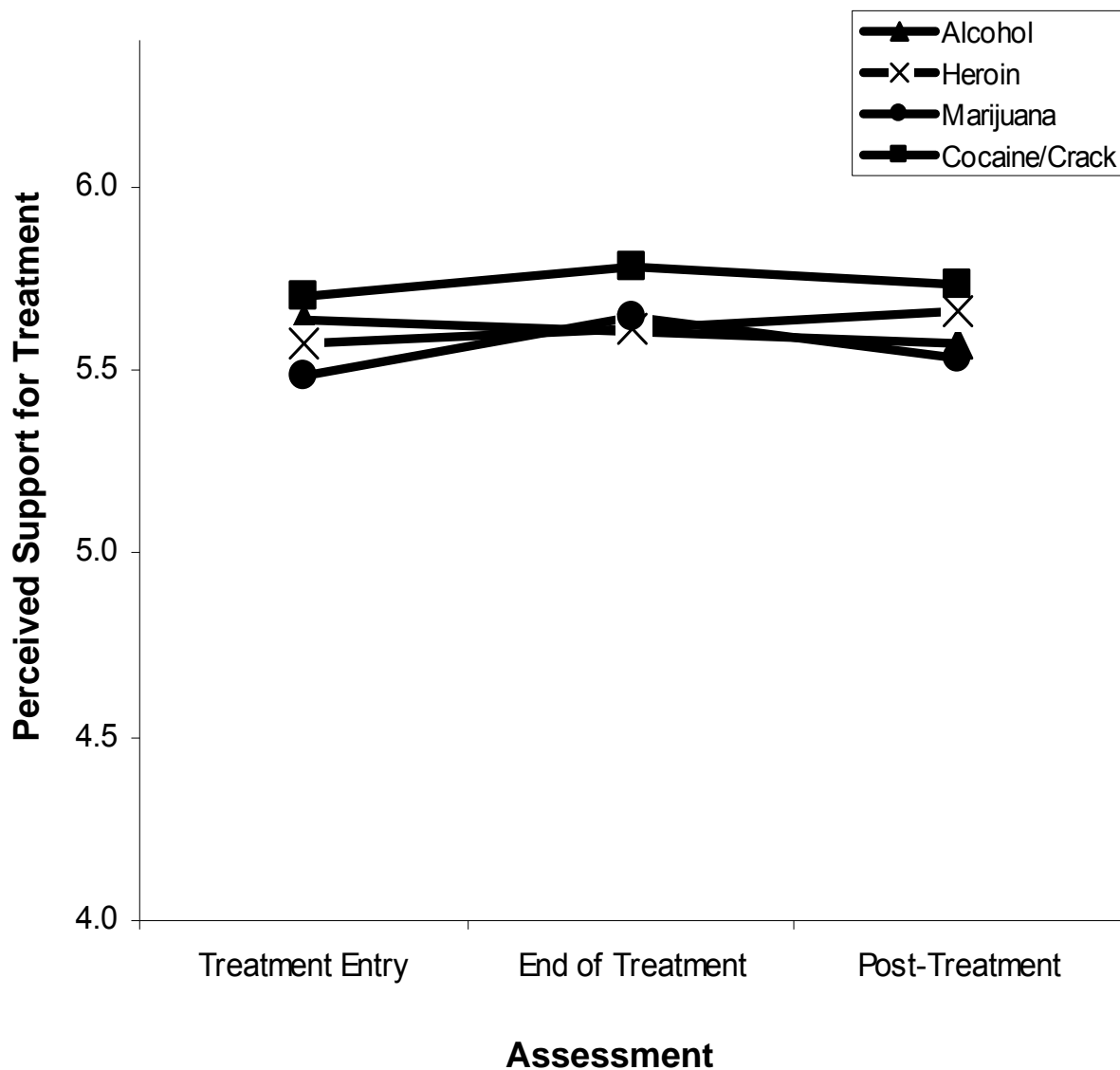


Figure 7. Average perceived support for substance abuse treatment from network members. Note: This variable was scored on a 6-point scale from “1: Would strongly oppose it” to “6: Would strongly support it”. The scale of this graph has been compressed to illustrate subtle group differences.

Changes in Substance Use

As illustrated in Figure 8, there was a significant decrease in the past thirty day use of the primary drug of choice across time in all drug preference groups [F (2,154) = 29.70, $p < .0001$]. Although the between-group main effect was non-significant [F (3,155) = 1.40, $p = n.s.$], women who reported heroin as their primary drug of choice reported significantly more overall days of drug use compared to women reporting alcohol as their primary drug of choice at the start of treatment [F (6,310) = 3.70, $p < .01$].

There was a significant decrease in drug and alcohol-related problems in the past thirty days across time in all primary drug groups [F (2,154) = 21.52, $p < .0001$] as well as a significant difference between groups [F (3,155) = 5.23, $p < .01$]. In general, it appeared that the heroin primary drug group experienced the greatest frequency of problems across all assessment points. A significant interaction revealed that women who reported heroin as their primary drug of choice reported significantly more drug related problems at treatment entry compared to all other treatment groups [F (6,310) = 4.82, $p < .0001$] (Figure 9).

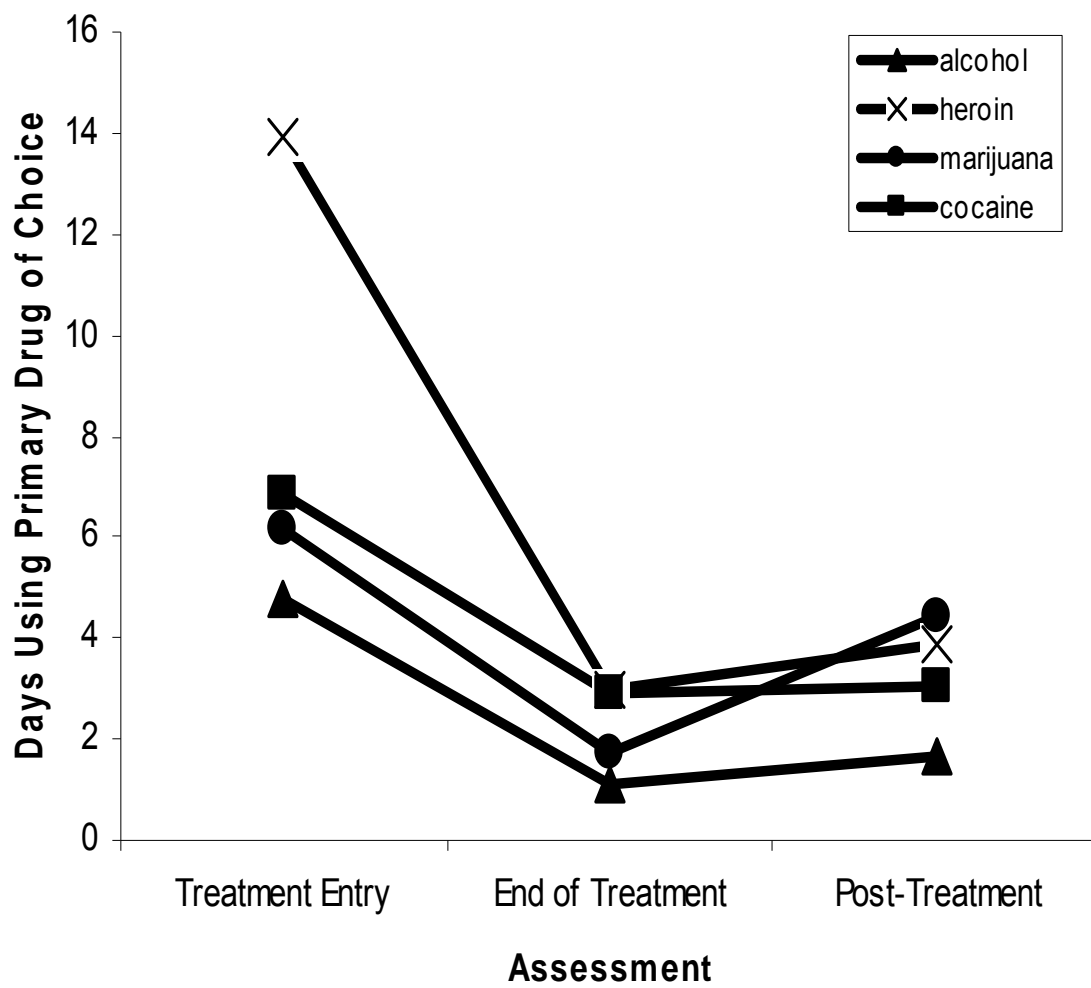


Figure 8. Past 30 day drug or alcohol use prior to treatment, at the end of treatment, and 6-months following treatment.

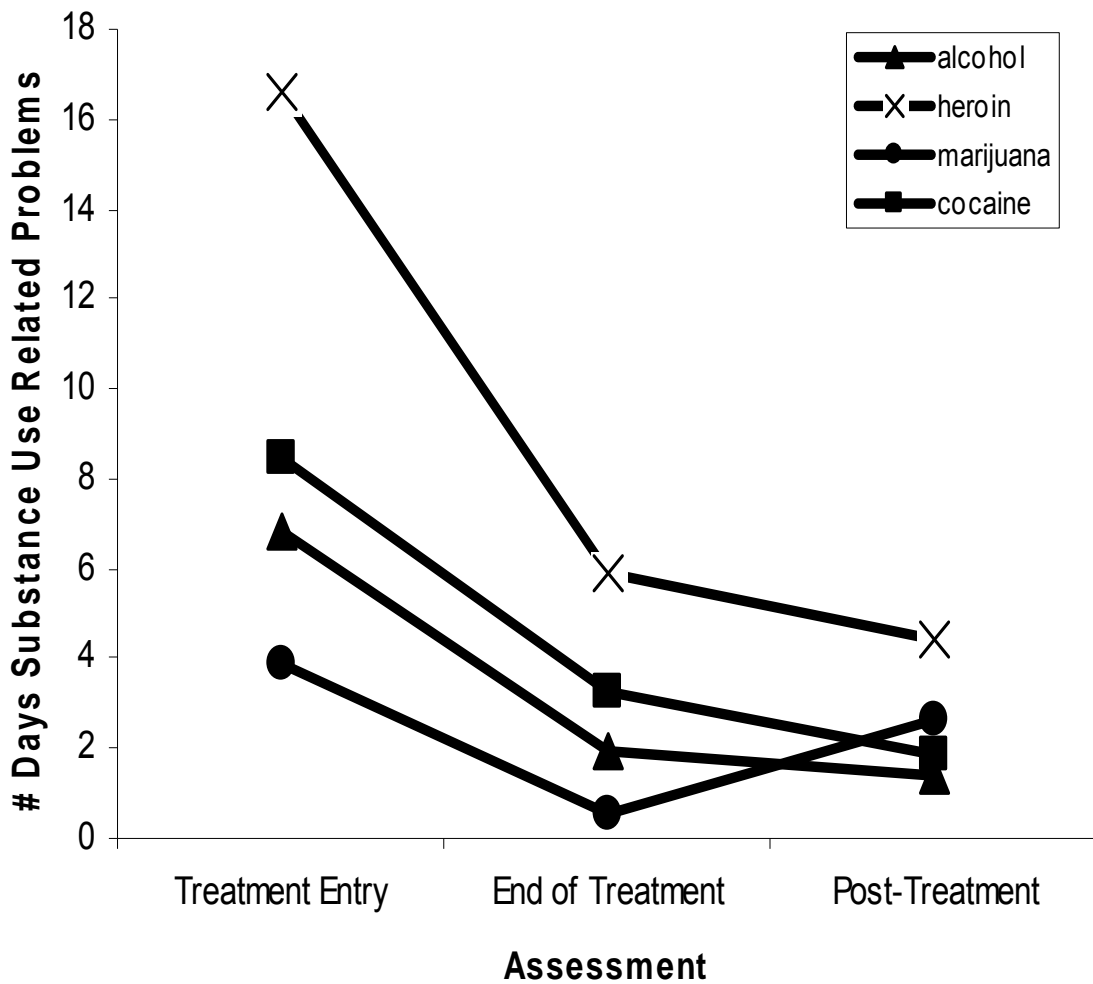


Figure 9. The number of days in the past 30 day use during which women participants experienced substance use-related problems.

CHAPTER IV

DISCUSSION

The focus of this dissertation is on mothers, a population that has only recently begun to gain formal standing as a specific research and treatment group with shared characteristics. The past twenty years has seen a dramatic increase in research focused on understanding the key processes in women's substance abuse and treatment. For example, women with substance abuse issues are often married to men with similar substance problems who are frankly opposed to their recovery (McCrary, 2004). Furthermore, unlike men, marriage actually increases risk for relapse among women (Walitzer & Dearing, 2006). These findings reinforce the notion that women may indeed carry unique characteristics that are crucial to consider when developing treatment strategies for them.

An obvious shared characteristic among women that can importantly factor into substance use and addiction recovery decisions is child care. Women in the U.S. still bear the primary responsibility for child rearing, and a multitude of related factors represent a formidable challenge in both treatment seeking and outcome. Child care is often too expensive and thus inaccessible, especially for mothers from low socioeconomic

circumstances. Even when childcare is available, mothers often face additional repercussions for admitting to past or present substance use. In addition to familial scorn and societal disgrace, legal retribution (e.g., removal of child) can occur in certain circumstances. Further, once in treatment, the shame of past substance use-induced failures in parenting can lead to serious emotional difficulties and increase risk for relapse if not adequately addressed. Research specifically focused on the needs of substance abusing women with minor children, however, is limited.

The present study assessed 246 mothers who had lost, or were in jeopardy of losing, custody of at least one minor child. Involvement in a substance use treatment program was a response to these custodial threats. The mothers in the present study were, in general, a high risk group of women in terms of a variety of physical and emotional problems. On average, these women had 2-3 children and nearly half had not achieved the equivalent of a high school degree; the majority were unemployed and unmarried (thus, likely to be functioning as a single mother); and nearly half had already been incarcerated at some point in their life. Thirty-four percent of the present sample reported heroin as their primary drug of choice; 30% reported cocaine/crack, 20% reported marijuana, and 16% reported alcohol; most were poly-drug users. Thus, these women represent a demographic in particular need of attention and yet, due to their disadvantaged socioeconomic status, complex substance use profiles, and heterogeneous psychosocial and personality characteristics, they have been largely neglected in the relevant literature. This study offers preliminary insight into factors, including primary drug of choice and social network characteristics, that may influence treatment outcome

in these disadvantaged women, but does so with the understanding that investigation of such a heterogeneous and difficult sample has important limitations.

Deconstructing Substance Use in Motherhood:

Primary Drug of Choice

Demographic, social network and substance use behavior differences were noted between the primary drug of choice groups at treatment entry, although not as hypothesized. Whereas the women using heroin prior to treatment entry appeared more demographically disadvantaged, it was the women who primarily engaged in marijuana use that were at the greatest disadvantage in terms of social networks that promoted continued use. Specifically, the primary heroin drug group were least likely to be living independently and most likely to be unemployed. Along with the primary cocaine group, they were also more likely to report living with a person with an SUD. Conversely, the primary marijuana group was younger and reported better health than the other primary drug groups. Nonetheless, comparisons across the primary drug groups at treatment entry revealed that marijuana users had the fewest number of friends, the fewest number of non-users, and the greatest number of frequent substance users in their social networks at treatment entry. In addition, their pre-treatment social networks appeared to be more neutral (i.e., less positive) towards their continued substance use than the pre-treatment social networks of women with other drug preferences.

In terms of drug use severity at treatment entry, heroin abusers were in the worst condition. These women reported dramatically more days of use of their primary drug of choice in the past thirty days than their peers who abused other drugs. Heroin abusers

also appeared least likely to report abstinence and the most likely to report use of multiple drugs over the past thirty days. While there were discrepancies between the other groups in certain measures of use, no pattern emerged that was as evident.

Deconstructing Substance Use in Motherhood:

Social Network Influences

The central tenet of this study is that a mother's likelihood of successful recovery from a substance use disorder is tied to the quality of her social relationships. There is considerable evidence from prior studies on other samples (e.g., male and female adult inpatients, adolescents) supporting both the negative influence of retaining social network members who are heavily engaged in their own substance use and the positive influence of retaining, reconnecting, or creating social bonds with individuals who support abstinence and themselves are free from maladaptive substance use behaviors. The present study offers preliminary support for the power of both of these influences on a sample of disadvantaged, treatment seeking mothers as well.

At both follow-up assessments (but not at treatment entry), greater frequency of network substance use was associated with more frequent substance use and use-related problems among the participants over the same period. In addition, frequency of network substance use at the end of treatment predicted both substance use outcome measures six months post-treatment. Abstinence-specific social support at treatment discharge was also associated with both outcome measures at the same time point and predicted the frequency of the client's substance use reported at the six month post-treatment follow-up. Taken together, these data offer tentative support for an important role of both

positive and negative social network influences on the treatment outcomes of mothers, particularly after these women enter treatment. These data are in keeping with prior research. Both the frequency of substance use in the social network and the availability of abstinence-specific support appeared capable of influencing current and future substance use behaviors and substance use-related problems in treatment-seeking women with young children. These preliminary findings should be replicated prior to strong conclusions being drawn.

Nonetheless, this is in line with the level and type of care offered by most treatment programs today. Most in- and outpatient addiction treatments attempt to teach clients to avoid the people and places that reinforce continued use or may trigger craving and relapse and offer them the opportunity to meet others who, like them, are seeking to decrease or cease their substance use. Based on the present findings, these messages are likely to be important for women with young children as they are for other addiction treatment clients.

An important caveat in interpreting the present findings, however, is that in a general sense, this study points to the complexity of evaluating an individual's network and predicting how one's network will affect decisions for future substance use. More advantaged statistical approaches (e.g., latent class or cluster analysis), for example, may provide a more rounded perspective on the global influence of a social network, rather than on the independent influences of each network member. Further, while specific features of a woman's social network in this study appeared to exert an influence on substance use behaviors, these features only accounted for a small percent of the overall variance in substance use. And whereas multiple demographic factors (e.g., minority

status, living with a person with a substance use disorder, experiencing a psychiatric problem in the past 30 days, and the number of children under the age of 17) as well as primary drug of choice also appeared to be important, at least in certain circumstances, it is likely that there are many other contributors (e.g., co-morbid conditions) to their chances for long-term positive substance use outcomes.

Deconstructing Substance Use in Motherhood:

Treatment-Related Changes in Substance Use and the Social Network

Anecdotal and empirical evidence underscore the importance of the social network in substance use treatment. In addition, both formal and informal aspects of a wide range of treatment programs target social networks as an important factor that promotes or inhibits change in substance use behaviors. Accordingly, it was hypothesized that the women in this study, regardless of their primary drug of choice, would report improvements to the social network (i.e., reporting changes to social network characteristics that paralleled goals of discontinuing substance use) during and following treatment. In support of this, all primary drug groups demonstrated less frequent substance use among remaining social network members. Although, contrary to the original hypothesis, a contraction in the size of the network across all networks was observed across all treatment groups, this may actually signify an improvement in social circumstances. It is possible that the lowered frequency of network use reflects a biased detachment from heavy using members. This again may indicate that treatment bolstered the chances at long-term positive outcomes in the women in this study by promoting positive changes in social network composition. These gains may be further enhanced,

however, by the replacement of these lost network members with abstinence-supporting peers or family members.

Nonetheless, not all primary drug groups appeared to benefit from these treatment lessons equally. Most glaringly, mothers who reported marijuana as their primary drug of choice appeared to be most disadvantaged in terms of supportive social networks at baseline, treatment discharge and six months post treatment. For example, marijuana users started with the smallest networks but concurrently reported the fewest non-users and the most negative role models in their network compared to the other primary drug groups. These marijuana using women also appear least capable of sustaining gains made during treatment, demonstrating a pattern of social support characteristics suggestive of a return to drug using social circles. During treatment they show a decrease in daily contact with their network, which paralleled a decrease in frequency of use among network members. However, 6-months post-treatment, these social indicators returned to or rebounded past their baseline levels.

These results, while interesting, must be interpreted with caution, based on the potential influences of other factors such as poly-drug use. At face value, however, it could be speculated that social network changes across time among women primarily abusing marijuana reflect a pattern of returning to their previous drug using rather than gaining new abstinence-supporting network members. This may further indicate that existing treatment rationale do not adequately address the powerful and potentially unique contribution of social support on marijuana use behaviors, an observation that warrants further exploration.

The reason for the specific social network differences between primary marijuana users and users of other drugs is not immediately clear. These results may reflect a broad societal belief that since marijuana is less physiologically harmful than other drugs, it is also less disruptive to emotional and psychological well being. Although it is unlikely that this message is reinforced within the treatment setting, it may not be sufficiently challenged. As a result, it is possible that while the client's marijuana use is actively discouraged by the basic principles of addiction treatment, the continued use of marijuana by her social network may not be directly or effectively addressed. This, in turn, may make it more difficult for a mother in treatment for a marijuana use disorder to receive a consistent message regarding the perils of maintaining relationships with social network members who continue to engage in marijuana use themselves. The present study, however, did not specifically assess the types of drugs used by the social network members of the participants; therefore, additional studies are needed to confirm this hypothesis. Conducting future studies such as these may hold particular significance for treatment providers, who may benefit from a more complete understanding of the influence of primary drug of choice on substance use outcomes.

It was also hypothesized that women using heroin and cocaine would be at a significant disadvantage for positive treatment outcomes. This position was not supported by the findings. Whereas woman who reported heroin as their primary drug of choice were clearly worse off at treatment entry, they improved more during treatment and reported a similar frequency of substance use and difficulties associated with that substance use at treatment discharge and six months post-treatment. Across all drug of choice groups, mothers in this study reported decreases in substance use behaviors and

problems between treatment entry and the end of treatment, suggesting that treatment providers were sufficiently adept in tailoring treatment plans within the various levels of care to address the substance using characteristics of their clients, regardless of their primary drug of choice.

It is worth noting that, although non-significant, assessment of the substance use trajectories of the primary marijuana users between the end of treatment and post-treatment assessment appeared to suggest that these women were already progressing towards increased substance use and use-related problems. This trend was not as evident in the other primary drug of choice groups. Future studies with longer follow-up periods are needed to determine whether primary marijuana users are in fact at a disadvantage for maintaining positive treatment outcomes and whether features of their social support networks play a role in their treatment success.

Taken together, this study offers preliminary evidence for the need to increase research and clinical attention on mothers with substance use problems, and for more directly assessing the relationship of primary drug of choice on treatment outcome. The present analyses suggest that the nature of the social structure of women with primary marijuana use disorders may be different than woman with other drug preferences. The results may indicate that marijuana use disorders are in fact more insidious than other substance use disorders that are more globally perceived as harmful and thus, in some ways, more difficult to treat. This possibility is particularly compelling based on an escalating prevalence of marijuana use among young adults (e.g., Mohler-Kuo, Lee, & Wechsler, 2003) and evidence suggesting it is the most commonly used illicit drug

among women with children under the age of eighteen years living at home (Simmons, Havens, Whiting, Holz, & Bada, 2009).

Limitations

This study was originally designed to address the efficacy of the New Jersey Division of Addiction Services and Division of Youth and Family Services “MOMS” program, which sets aside money to support addiction treatment for women with young children. As such, the primary research questions emphasized in the overall study were necessarily balanced with the primary economic questions of the state agencies. These competing interests resulted in the need to broaden recruitment strategies to include women who had already initiated treatment. This may explain the unexpectedly low frequency and quantity of substance use reported at treatment entry. Additionally, however, the low levels of reported substance use may be related to the legal difficulties (mostly pertaining to the custody of their minor children) being experienced by these women, which may lead women to underreport actual substance use behaviors. As stated earlier, mothers face many barriers to treatment and obstacles to maximally benefiting from treatment, among them may be the fear that admitting heavy or problematic substance use behaviors could lead to severe and permanent repercussions.

Based on the design of this study to recruit women specifically from within the DYFS “MOMS” program, the participants included in the study were diverse in terms of their socio-demographic background, their substance using habits, and their intrapersonal characteristics. Women were categorized based on primary drug of choice because, even though a large percent of these women reported poly-drug use, it was the primary drug

preference that was expected to guide the majority of drug-seeking behavior. However, these categorizations were based on self-reported substance use patterns. Due to time and staffing considerations, the Structured Clinical Interview for DSM Disorders (SCID) was not administered to confirm diagnoses of substance use disorders.

This study did not include a control group as it would be perceived as unethical to allow mothers who were at risk for losing custody of their minor children to maintain substance use habits without intervention. Rather, women were enrolled into one of twenty-six state-funded programs that offered three different levels of care, including drug-free or methadone maintenance intensive outpatient programs and residential programs. Women from each primary drug of choice group were represented in the drug-free outpatient and residential treatment programs; all but one client in the methadone treatment program reported heroin as their primary drug of choice. Due to missing data, particularly associated with pre-treatment substance use behaviors of women in the methadone outpatient program, assessment of the influence of treatment modality was not possible.

Co-morbid physical and mental disorders were not assessed in the present study, although co-morbid conditions, such as depression and anxiety are known to influence substance use and treatment outcomes. In addition, treatment factors that are known to mediate or moderate treatment outcomes, including self-efficacy, treatment compliance, and cognitive impairments were not characterized. Future studies should include these variables. This study used only a subset of available data on these participants, and important additional consideration is the impact of substance use, treatment, and recovery on the well-being of the children of these women.

Although the present study must be considered preliminary based on these and other limitations, it offers compelling evidence for the need to continue to discern the unique needs of mothers with dependent children who struggle with substance use disorders. Future studies would benefit from inclusion of a control group, structured assessment of substance use diagnoses, and a longer follow up time point to track long-term treatment outcomes.

Conclusions

The wide continuum of substance use behaviors is governed by an array of genetic, intrapersonal, interpersonal, and environmental factors. The field of addictions science has worked diligently to determine just what distinguishes a pathological trajectory of substance use from a socially acceptable one. Given the incredible breadth of heterogeneity in the population and the sheer number of relevant variables, there are bound to be differing, and at times contradictory, messages garnered from the data. It now appears clear however that research treating the population of substance dependent persons as a relatively homogeneous group of individuals suffering from a seemingly homogeneous set of problems is insufficient. Further, with so much of the early addictions theory coming from studies of men in Veteran Administration hospitals and so much generational shifting in the popularity of drugs of abuse, even the most basic and well-established facts concerning the progression towards, and the recovery from, substance use disorders may need to be revisited.

This study represents a preliminary attempt to extend knowledge of drug and alcohol use behavior and treatment into an understudied population: mothers. Although

the present sample of mothers had important obstacles to treatment seeking overcome through the actual or threat of DYFS involvement, the data suggest that once they are in treatment they can make good use of it. They demonstrated positive substance use outcomes and improvements in their social networks. Primary drug of choice did not appear to play a major role in treatment outcome, although heroin users had more problems at treatment entry and marijuana users reported more frequent drug-using social networks six months after treatment. Studies that include an additional, longer-term follow up are needed to determine if these factors would differentiate drug use trajectories in the respective mothers.

An interesting, and unexpected, outcome from this study was that marijuana users differed from heroin, cocaine and alcohol users, such that they appeared to be more treatment resistant. One avenue for future research is to better understand how social networks view marijuana use in mothers. If mothers are receiving the message that continued use does not imperil their children, as is presumably the case in “harder” drugs, they may be less likely to change and more likely to seek out and find other people offering a similarly permissive message. Treatment may benefit from a more pronounced focus on the effects of marijuana abuse. Nonetheless, this study offers only an initial look at this issue, but strongly suggests the need for more careful examination.

There is anecdotal as well as empirical evidence that marijuana use is not considered as harmful as other drugs, including alcohol. A basic internet search of worldwide 12-step meetings specifically associated with issues of alcohol, marijuana, or narcotic use identified approximately 113,000 Alcohol Anonymous meetings and 40,000 Narcotics Anonymous meetings, but under 250 Marijuana Anonymous meetings. In

addition, a recent article developed a nine-parameter scale classifying the harm of potentially addictive substances based on “the physical harm to the individual user caused by the drug; the tendency of the drug to induce dependence; and the effect of drug use on families, communities, and society” (Nutt, King, Saulsbury, & Blakemore, 2007). Based on this scale, heroin and cocaine demonstrated the highest mean harm scores, respectively; alcohol received the fifth highest mean harm score; and marijuana was ranked eleventh in mean harm (just below tobacco). This classification scheme was then verified using two independent samples of experts (psychiatrists with registered specialties in addiction and scientists with a broad range of experience related to addiction research). Both expert panels ranked heroin, cocaine, and alcohol as having the highest harm scores and marijuana as having one of the lowest harm scores (along with ecstasy, LSD, and steroids) (Nutt, King, Saulsbury, & Blakemore, 2007).

These observations seem to argue that marijuana need not receive the same attention as other drugs of abuse within the treatment setting or by society at large. The present results, however, challenge the premise that reduction in marijuana use is a less important treatment goal. More specifically, whereas marijuana users did indeed demonstrate a more benign pattern of use at treatment entry, they were more likely than their peers to show a pattern of results suggesting a rebound of these difficulties by six months post-treatment. This pattern may reflect a weaker engagement in the treatment process, which is possibly, at least in part, explained by the cultural expectations of marijuana use consequences.

In conclusion, assessment of women who have young children and who also have a substance use disorder has made clear that the more we understand of substance use

origins, trajectories and outcomes, the less reliable general truisms become. In a sense, it has not been solely the case that the more we learn, the more we realize we don't know; it appears also to be the case that the more we learn, the more our previous knowledge is challenged. Future studies would benefit from an integrated, sophisticated approach that considers the vast array of inter- and intrapersonal forces involved in successful treatment seeking, completion and maintenance.

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